

माध्यमिक शिक्षा पाठ्यक्रम, २०७६

(कक्षा ११ र १२)

भाग ५

(ऐच्छिक विषय)



नेपाल सरकार
शिक्षा, विज्ञान तथा प्रविधि मन्त्रालय
पाठ्यक्रम विकास केन्द्र
सानोठिमी भक्तपुर

प्रकाशक : नेपाल सरकार
 शिक्षा, विज्ञान तथा प्रविधि मन्त्रालय
 पाठ्यक्रम विकास केन्द्र
 सानोठिमी, भक्तपुर

© सर्वाधिकार : पाठ्यक्रम विकास केन्द्र

वि.सं. २०७६

मुद्रण :

प्राक्कथन

पाठ्यक्रम सिकाइ शिक्षणको मूल आधार हो । पाठ्यक्रममा समावेश हुने विषयवस्तु र तिनको अभ्यासको स्तरले शिक्षाको समग्र गुणस्तरलाई प्रभाव पार्दछ । पाठ्यक्रमले प्रत्येक व्यक्तिमा अन्तर्निहित प्रतिभा प्रस्फुटन गराई व्यक्तित्व विकास गर्न सक्नुपर्छ । यसै गरी राष्ट्र र राष्ट्रियताप्रति निष्ठावान्, स्वाभिमानी, नैतिकवान्, जिम्मेवार, श्रमलाई सम्मान गर्ने, उच्चमशील र सिपयुक्त नागरिक विकासमा पाठ्यक्रमले सहयोग गर्नु पर्दछ । पाठ्यक्रम कार्यान्वयनपछि उत्पादित जनशक्तिले सामाजिकीकरणमा सहयोग गर्नुका साथै राष्ट्रिय एकता सुदृढ गर्दै राष्ट्रिय सम्पदा र पर्यावरणको संरक्षण गर्न सक्नुपर्छ । यस पाठ्यक्रमबाट विद्यार्थीमा शान्ति, समानता तथा सामाजिक न्यायप्रति प्रतिबद्ध भई सहिष्णुता तथा सदाचार जस्ता आचरण विकासमा सहयोग पुग्ने अपेक्षा गरिएको छ । यसबाट सूचना प्रविधिको प्रयोग, वैज्ञानिक अवधारणाको आत्मसात्, खोज तथा अनुसन्धान क्षमताको विकास र जीवनोपयोगी सिप प्राप्तिका माध्यमले प्रतिस्पर्धात्मक क्षमतायुक्त जनशक्ति तयार गर्नुका साथै आफ्नो भाषा, संस्कृति, कलाप्रतिको अनुरागसहितको पहिचानमा गौरवको अनुभूति गर्ने नागरिक विकासमा योगदान हुने अपेक्षा गरिएको छ । यी पक्षहरूलाई दृष्टिगत गर्दै राष्ट्रिय पाठ्यक्रम प्रारूप, २०७६ को मार्गनिर्देशअनुसार कक्षा ११ र १२ का लागि यो पाठ्यक्रम विकास गरिएको हो ।

पाठ्यक्रम विकास प्रक्रियामा सम्बद्ध विभिन्न सरोकारवालाहरूको सहभागिता जुटाइएको थियो । माध्यमिक तह (कक्षा ११-१२) का विभिन्न विषयका पाठ्यक्रम विकास प्रक्रियामा सहभागी शिक्षाविद्, प्राध्यापक, शिक्षक, विद्यार्थी, अभिभावक तथा शिक्षासम्बद्ध सङ्घसंस्था र सरोकारवालाहरू, पाठ्यक्रम मस्यौदा कार्यदल तथा सम्बन्धित विषय समितिका सदस्यहरूलगायतका सुझावलाई समेटि यो पाठ्यक्रम तयार गरिएको छ । पाठ्यक्रममा विद्यार्थीका सक्षमता, अपेक्षित सिकाइ उपलब्धि, विषयवस्तुको क्षेत्र तथा क्रम, सिकाइ सहजीकरण प्रक्रिया र सिकाइ उपलब्धि आकलन प्रक्रिया समावेश गरिएको छ । यस कार्यमा पाठ्यक्रम मस्यौदा कार्यदल तथा सम्बन्धित विषय समितिका सदस्यहरूलगायत उल्लिखित सरोकारवालाहरू तथा पाठ्यक्रम विकास केन्द्रका सम्बन्धित कर्मचारी योगदान रहेको छ । पाठ्यक्रम विकासमा आवश्यक नीतिगत मार्गदर्शन प्रदान गर्नुका साथै पाठ्यक्रमलाई अन्तिम रूप दिने कार्यमा राष्ट्रिय पाठ्यक्रम विकास तथा मूल्याङ्कनबाट गठित विभिन्न प्राविधिक समितिहरूको भूमिका महत्त्वपूर्ण रहेको छ । पाठ्यक्रम विकास केन्द्र पाठ्यक्रम विकासमा योगदान गर्ने सबैप्रति कृतज्ञता प्रकट गर्दछ ।

यो पाठ्यक्रमको प्रभावकारी कार्यान्वयनका लागि सम्बद्ध सबै पक्षको योगदान अपेक्षित छ । पाठ्यक्रम सुधारको कार्य निरन्तर चल्ने प्रक्रिया भएकाले भविष्यमा यसलाई अझ प्रभावकारी बनाउन शिक्षक, अभिभावक तथा समस्त बुद्धिजीवीहरूलगायत सम्बद्ध सबैबाट पाठ्यक्रम विकास केन्द्र रचनात्मक सुझावको अपेक्षा गर्दछ ।

वि.सं. २०७६

पाठ्यक्रम विकास केन्द्र
सानोठिमी, भक्तपुर

विषय सूची

क्र.स.	विषयवस्तु	पृष्ठ
१.	माध्यमिक शिक्षा (कक्षा ११ र १२) पाठ्यक्रम २०७६ : परिचय तथा संरचना	१
२.	Maths	१९
३.	Applied Mathematics	३६
४.	Business Mathematics	५१
५.	Library and Information Science	६८
६.	Home Science	९०
७.	Environmental Science	११३
८.	General Law	१३०
९.	Finance	१४२
१०.	बौद्ध अध्ययन	१५८
११.	प्रायोगिक कला	१६७
१२.	गायन	१८०
१३.	Apiculture and Sericulture	१८९
१४.	सौन्दर्य तथा केशकला शिक्षा	२०२
१५.	जडीबुटी	११८
१६.	Plumbing and Wiring	२२९
१७.	Hotel Management	२५२
१८.	आमसञ्चार	२७६

खण्ड क

माध्यमिक शिक्षा (कक्षा ११ र १२) पाठ्यक्रम २०७६ : परिचय तथा संरचना

१. परिचय

पाठ्यक्रमको विकास, परिमार्जन तथा अद्यावधिक गर्ने कार्य निरन्तर चलिरहने प्रक्रिया हो । परिवर्तित सन्दर्भ, अध्ययन अनुसन्धानका प्रतिवेदन, शिक्षक, प्राध्यापक, विद्यार्थी, बुद्धिजीविलगायत विभिन्न सरोकारवालाबाट प्राप्त सुझाव तथा प्रतिक्रिया, विभिन्न सङ्घसंस्था र पेसासँग आबद्ध सङ्घ सङ्गठनका सुझाव, सूचना तथा सञ्चारका माध्यम र नागरिक समाजबाट पाठ्यक्रमलाई सान्दर्भिक तथा समावेशी बनाउन प्राप्त सकारात्मक सल्लाहका आधारमा राष्ट्रिय पाठ्यक्रम प्रारूप, २०७६ तयार भई नेपाल सरकारबाट स्वीकृत भएको छ । यस प्रारूपले निर्देश गरेको विद्यालय तहको पाठ्यक्रम संरचना एवम् पाठ्यक्रम विकासका मार्गदर्शक सिद्धान्त, ज्ञानको विस्तार तथा सिर्जना, सेवा क्षेत्रमा बढेको प्रतिस्पर्धा तथा राजनीतिक, सामाजिक र आर्थिक क्षेत्रमा आएको परिवर्तनले पाठ्यक्रम परिमार्जनको आवश्यकता औल्याएका छन् । नेपालमा विद्यालय शिक्षालाई सामाजिक न्यायमा आधारित समृद्ध राष्ट्र निर्माणका लागि सक्षम र प्रतिस्पर्धी नागरिक तयार गर्न सहयोग गर्ने माध्यमका रूपमा विकास गर्नुपर्ने दृष्टिकोण रहेको छ । विद्यालय शिक्षाको उल्लिखित सन्दर्भ तथा दृष्टिकोणमा आधारित भई कक्षा ११ र १२ का लागि पाठ्यक्रम संरचना तथा सो संरचनाअनुसारका विषयगत पाठ्यक्रमहरू विकास गरिएको छ ।

विद्यालयको शिक्षालाई आधारभूत र माध्यमिक गरी दुई तहमा बाँडिएको छ । माध्यमिक शिक्षाले विद्यार्थीहरूमा ज्ञानको खोजी गरी सिकाइ र वास्तविक जीवनबिच सम्बन्ध स्थापित गर्ने, सिद्धान्त र व्यवहारको समन्वय गर्ने तथा स्वपरावर्तित हुँदै ज्ञान, सिप र क्षमतालाई अद्यावधिक गर्ने सक्षमता विकास गराउनु पर्छ । यस तहको शिक्षाले अधिकार, स्वतन्त्रता र समानताको प्रवर्धन गर्ने, आफ्नो कर्तव्यप्रति सचेत हुने, स्वस्थ जीवन शैलीको अभ्यास गर्ने, तार्किक विश्लेषण गरी निर्णय गर्ने, वैज्ञानिक विश्लेषणका आधारमा व्यक्ति, समाज र राष्ट्रको दिगो विकासमा सरिक हुने नागरिक तयार गर्न सहयोग गर्नुपर्छ । विद्यार्थीहरूमा नैतिक आचरण प्रदर्शन गर्ने, सामाजिक सद्भावप्रति संवेदनशील हुने, पर्यावरणीय सन्तुलनप्रति संवेदनशील हुने, द्वन्द्व व्यवस्थापन गर्दै दिगो शान्तिका लागि प्रतिबद्ध रहने, आधुनिक ज्ञान, सिप, सूचना तथा सञ्चार प्रविधिको प्रयोग गर्ने, स्वावलम्बी र व्यवसायमुखी सिपको अभ्यास गर्ने सक्षमताको विकास यस तहको शिक्षाका अपेक्षा हुन् । त्यसै गरी राष्ट्र, राष्ट्रियता र राष्ट्रिय आदर्शको सम्मान गर्ने, समाज स्वीकार्य आचरण र कार्य संस्कृतिको अवलम्बन गर्ने, सहिष्णुभाव राख्ने, सिर्जनशील, कल्पनाशील, उद्यमशील एवम् उच्च सोच र आदर्शमा आधारित व्यवहार गर्ने, समसामयिक चुनौतीहरूको सफल व्यवस्थापन गर्नेलगायतका विशेषताले युक्त स्वावलम्बी, देशभक्त, परिवर्तनमुखी, चिन्तनशील एवम् समावेशी समाज निर्माणमा योगदान गर्न सक्ने सक्षम नागरिक तयार गर्नु यस तहको शिक्षाको कार्यदिशा हो । यसका लागि कक्षा ११ र १२ को पाठ्यक्रम संरचनालाई पुनः संरचित गर्न राष्ट्रिय पाठ्यक्रम विकास तथा मूल्याङ्कन परिषद्बाट अन्तिम रूप दिई र नेपाल सरकारबाट स्वीकृत भएको राष्ट्रिय पाठ्यक्रम प्रारूप, २०७६ लाई आधार मानी माध्यमिक तह (कक्षा ११ र १२) का विभिन्न विषयका पाठ्यक्रम विकास गरिएको हो ।

यो पाठ्यक्रमको पहिलो खण्डमा माध्यमिक शिक्षा (कक्षा ११ र १२) पाठ्यक्रम २०७६ को परिचय तथा संरचना समावेश गरिएको छ । यसमा शिक्षाका राष्ट्रिय उद्देश्य, तहगत सक्षमता तथा पाठ्यक्रमको समग्र संरचना समावेश गरिएको छ । दोस्रो खण्डमा अनिवार्य विषयका पाठ्यक्रम समावेश गरिएको छ । यसले विषयगत सिकाइ उपलब्धि, विषयवस्तु, शिक्षण सिकाइका लागि आवश्यक विधि/प्रविधि तथा मूल्याङ्कनका पक्षलाई पनि मार्गनिर्देश गरेको छ । पाठ्यक्रमको क्रमागत स्तरीकरण गर्न एवम् अधिल्ला र पछिल्ला तहका पाठ्यक्रमबिचको तहगत सङ्गति कायम गर्ने गरी यो पाठ्यक्रम विकास गरिएको छ ।

२. शिक्षाका राष्ट्रिय उद्देश्य

विद्यालय शिक्षाका राष्ट्रिय उद्देश्यहरू निम्नानुसार हुने छन् :

१. प्रत्येक व्यक्तिलाई अन्तर्निहित प्रतिभा प्रस्फुटन गरी व्यक्तित्व विकास गर्ने
२. राष्ट्र र राष्ट्रियताप्रति निष्ठावान्, सङ्घीय लोकतान्त्रिक गणतन्त्रका मूल्य मान्यताप्रति प्रतिबद्ध, स्वाभिमानी, सामाजिक तथा सांस्कृतिक विविधतालाई सम्मान गर्ने, चरित्रवान्, नैतिकवान् एवम् जिम्मेवार नागरिक तयार गर्ने

३. श्रमप्रति सम्मान एवम् सकारात्मक सोच भएका, रोजगार तथा स्वरोजगारउन्मुख, उत्पादनमुखी, उद्यमशील र सिपयुक्त नागरिक तयार गर्ने
४. व्यक्तिको सामाजिकीकरणमा सहयोग गर्दै सामाजिक सद्भाव तथा सहिष्णुता र राष्ट्रिय एकता सुदृढ गर्न सहयोग पुऱ्याउने
५. प्राकृतिक तथा राष्ट्रिय सम्पदा र पर्यावरणको संरक्षण, संवर्धन र सदुपयोग गर्दै दिगो विकासमा योगदान गर्ने सचेत नागरिक तयार गर्ने
६. प्रत्येक व्यक्तिको शान्ति, मानव अधिकार, समानता, समावेशिता र सामाजिक न्यायका मान्यताअनुरूपको आचरण विकास गरी समतामूलक, समावेशी, न्यायपूर्ण र समाजवादउन्मुख राष्ट्र निर्माणमा मदत गर्ने
७. राष्ट्रिय तथा अन्तर्राष्ट्रिय स्तरमा प्रतिस्पर्धी, आधुनिक सूचना तथा सञ्चार प्रविधि प्रयोग गर्न सक्ने विश्वपरिवेश सुहाउँदो दक्ष जनशक्ति तयार गर्ने
८. वैज्ञानिक अवधारणा, तथ्य, सिप, सिद्धान्त तथा प्रविधिको प्रयोग गर्न सक्ने वैज्ञानिक सुभ्रुभ्र भएका तथा अनुसन्धानमुखी जनशक्ति तयार गर्ने
९. रचनात्मक तथा समालोचनात्मक चिन्तन गर्ने, जीवनोपयोगी सिप भएका सहिष्णु र भाषिक सक्षमतामा निपुण नागरिक तयार गर्ने
१०. नेपाली मौलिक कला, संस्कृति, सौन्दर्य, आदर्श तथा वैशिष्ट्यहरूको संरक्षण, संवर्धन र विस्तारतर्फ अभिप्रेरित भएका नेपालको इतिहास, भूगोलको ज्ञान भएको, नेपाली पहिचान र जीवनशैलीप्रति गौरव गर्ने नागरिक तयार गर्ने
११. जलवायु परिवर्तन तथा प्राकृतिक एवम् मानव सिर्जित प्रकोपप्रति सचेत रही सम्भावित जोखिम न्यूनीकरण तथा विपत् व्यवस्थापन गर्न सक्षम नागरिक तयार गर्ने
१२. सामाजिक न्यायमा आधारित समृद्ध राष्ट्र निर्माणका निमित्त आवश्यक मानव संसाधनको विकास गर्ने

३. विद्यालय शिक्षाको तहगत संरचना र उमेर

नेपालको विद्यालय शिक्षा आधारभूत र माध्यमिक गरी दुई तहको रहेको छ । एक वर्ष अवधिको प्रारम्भिक बालविकास तथा शिक्षापछि कक्षा १ देखि कक्षा ८ सम्म गरी जम्मा आठ वर्षको आधारभूत शिक्षा कायम गरिएको छ भने कक्षा ९ देखि १२ सम्मको चार वर्ष अवधिको माध्यमिक शिक्षा कायम गरिएको छ । माध्यमिक शिक्षा साधारण, परम्परागत र प्राविधिक तथा व्यावसायिक गरी तीन प्रकारको हुने छ । माध्यमिक शिक्षाको प्राविधिक तथा व्यावसायिक धारतर्फ थप एक वर्ष अवधिको व्यावहारिक अभ्यास समेटिने छ । बालमनोविज्ञान, सिकाइको उमेर तथा सिकाइ क्षमतास्तरका आधारमा विद्यालय शिक्षाको तहगत र कक्षागत खाका देहायबमोजिम हुने छ :

विद्यालयको तह	कक्षा	उमेर समूह	सिकाइ क्षमतास्तर
प्रारम्भिक बालविकास तथा शिक्षा	प्रारम्भिक बालविकास तथा शिक्षा	४ वर्ष	
आधारभूत	कक्षा १- ३	५ देखि ७ वर्षसम्म	तह १
	कक्षा ४ - ५	८ देखि ९ वर्षसम्म	तह २
	कक्षा ६ - ८	१० देखि १२ वर्षसम्म	तह ३
माध्यमिक	कक्षा ९ - १०	१३ देखि १४ वर्षसम्म	तह ४
	कक्षा ११ - १२	१५ देखि १६ वर्षसम्म	तह ५

द्रष्टव्य :

१. माध्यमिक तहको प्राविधिक तथा व्यावसायिक धारतर्फ व्यावहारिक अभ्याससहित एक वर्षको अवधि थप हुने छ ।
२. उल्लिखित तालिकामा निर्दिष्ट उमेर समूहले सम्बन्धित वर्षको उमेर पूरा भएको जनाउने छ ।

४. माध्यमिक शिक्षा (कक्षा ९-१२) का सक्षमता

माध्यमिक शिक्षाले विद्यार्थीमा ज्ञानको खोजी गरी सिकाइ र वास्तविक जीवनबिच सम्बन्ध स्थापित गर्ने, सिद्धान्त र व्यवहारको समन्वय गर्ने, स्वपरावर्तित हुँदै ज्ञान, सिप र क्षमतालाई अद्यावधिक गर्ने सक्षमताको विकास गर्ने छ । त्यसै गरी विद्यार्थीमा अधिकार, स्वतन्त्रता र समानताको प्रवर्धन गर्ने, स्वस्थ जीवनको अभ्यास गर्ने, तार्किक विश्लेषण गरी निर्णय गर्ने, वैज्ञानिक विश्लेषणका आधारमा व्यक्ति, समाज र राष्ट्रको दिगो विकासमा सरिक हुने सक्षमताको विकास यस तहको शिक्षाले गर्ने छ । विद्यार्थीमा नैतिक आचरण प्रदर्शन गर्ने, सामाजिक सद्भावप्रति संवेदनशील हुने, पर्यावरणीय सन्तुलनप्रति संवेदनशील हुने, द्वन्द्व व्यवस्थापन गर्दै दिगो शान्तिका लागि प्रतिबद्ध रहने सक्षमताको विकास पनि यस तहको शिक्षाबाट अपेक्षित छन् । यस तहको शिक्षाबाट आधुनिक ज्ञान, सिप, सूचना तथा सञ्चार प्रविधिको प्रयोग गर्ने, स्वावलम्बी र व्यवसायमुखी सिपको अभ्यास गर्ने, राष्ट्र, राष्ट्रियता र राष्ट्रिय आदर्शको सम्मान गर्ने, समाज स्वीकार्य आचरण र कार्य संस्कृतिको अवलम्बन गर्ने, सहिष्णुभाव राख्ने सक्षमता भएको नागरिक तयार गर्ने अपेक्षा रहेको छ । त्यस्तै, सिर्जनशील, कल्पनाशील, उद्यमशील एवम् उच्च सोच र आदर्शमा आधारित व्यवहार गर्ने, समसामयिक चुनौतीहरूको सफल व्यवस्थापन गर्नेलगायतका विशेषताले युक्त स्वावलम्बी, देशभक्त, परिवर्तनमुखी, चिन्तनशील एवम् समावेशी समाज निर्माणमा योगदान गर्न सक्ने सक्षमतासहितको नागरिक तयार गर्नु माध्यमिक शिक्षाको लक्ष्य रहेको छ । यसर्थ माध्यमिक तहका विद्यार्थीमा विकास गर्ने अपेक्षा गरिएका सक्षमता निम्नानुसार रहेका छन् :

१. मानवीय मूल्य, मान्यता र लोकतान्त्रिक संस्कार अवलम्बन गर्दै राष्ट्र र राष्ट्रियताको प्रवर्धनका लागि सचेत नागरिकको जिम्मेवारी वहन
२. राष्ट्रिय तथा अन्तर्राष्ट्रिय परिवेशसँग परिचित भई विविधता, सद्भाव र सहअस्तित्वलाई आत्मसात् गर्दै सभ्य, सुसंस्कृत र समतामूलक समाज निर्माणका लागि भूमिका निर्वाह
३. दैनिक क्रियाकलापका साथै प्राज्ञिक क्षेत्रमा आत्मविश्वासका साथ उपयुक्त, सिर्जनात्मक र सान्दर्भिक रूपमा भाषिक सिपको प्रयोग
४. प्रभावकारी सिकाइ, रचनात्मक र विश्लेषणात्मक सोच तथा सामाजिक सम्पर्क र सञ्चारबाट विचारहरूको आदान प्रदान
५. व्यक्तिगत विकास र आवश्यकताको परिपूर्तिका लागि सिकाइप्रति सकारात्मक सोचको विकास तथा स्वअध्ययन एवम् ज्ञान र सिपको खोजी गर्ने बानीको विकास
६. व्यावहारिक गणितीय ज्ञान तथा सिपको बोध तथा प्रयोग र समस्या समाधानमा गणितीय अवधारणा, सिद्धान्त तथा तार्किक सिपको प्रयोग
७. व्यावहारिक वैज्ञानिक ज्ञान, तथ्य, सिद्धान्त र प्रविधिको समुचित प्रयोग
८. वैज्ञानिक खोज तथा अनुसन्धान गर्न आवश्यक प्रक्रियागत सिपहरू हासिल गरी आधुनिक प्रविधिहरूको दैनिक जीवनमा प्रयोग
९. जीवनजगत् र व्यवहारसँगको तादात्म्य बोध गरी जीवनोपयोगी सिप (Life skills) को प्रयोग गर्दै समाजसापेक्ष व्यवहार प्रदर्शन
१०. स्वास्थ्यप्रतिको सचेततासहित वातावरण संरक्षण र संवर्धन तथा जनसङ्ख्या व्यवस्थापनमा सक्रिय सहभागिता
११. प्राकृतिक तथा सामाजिक घटनाको विश्लेषण, तिनको कारण र असर बोध तथा सकारात्मक व्यवहार प्रदर्शन
१२. श्रमप्रति सम्मान गर्दै कामको संसारमा आत्मविश्वाससाथ तयारी
१३. प्राविधिक ज्ञान, सिप, प्रवृत्ति तथा पेशागत र व्यवस्थापकीय क्षमताको विकास र प्रयोग
१५. उच्च तहमा अध्ययनको आधार विकास

५. माध्यमिक शिक्षा (कक्षा ११-१२) का सक्षमता

माध्यमिक शिक्षा (कक्षा ११-१२) का सक्षमताहरू निम्नानुसार हुने छन् :

१. मानवीय मूल्य, मान्यता र लोकतान्त्रिक संस्कार अवलम्बन गर्दै राष्ट्र र राष्ट्रियताको प्रवर्धनका लागि सचेत नागरिकको जिम्मेवारी वहन
२. राष्ट्रिय तथा अन्तर्राष्ट्रिय परिवेशसँग परिचित भई विविधता, सद्भाव र सहअस्तित्वलाई आत्मसात् गर्दै सभ्य सुसंस्कृत र समतामूलक समाज निर्माणका लागि भूमिका निर्वाह

३. दैनिक क्रियाकलापका साथै प्राज्ञिक क्षेत्रमा आत्मविश्वासका साथ उपयुक्त, सिर्जनात्मक र सान्दर्भिक रूपमा भाषिक एवम् सञ्चार सिपको प्रयोग
४. व्यक्तिगत विकास र आवश्यकताको परिपूर्तिका लागि सिकाइप्रति सकारात्मक सोचको विकास तथा स्वअध्ययन एवम् ज्ञान र सिपको खोजी गर्ने बानीको विकास
५. जीवन, जीविका र वृत्ति एवम् सामाजिक सांस्कृतिक व्यवहारसँग तादात्म्य बोध गरी जीवनोपयोगी सिप (Life skills) को विकास
६. स्वस्थ जीवनशैलीको अवलम्बन एवम् वातावरण संरक्षण र दिगो विकासका लागि भूमिका निर्वाह
७. प्राकृतिक तथा सामाजिक घटनाको विश्लेषण, तिनको कारण र असर बोध तथा सकारात्मक व्यवहार प्रदर्शन
८. श्रमप्रति सम्मान गर्दै कामको संसारमा आत्मविश्वासको साथ प्रवेश
९. प्राविधिक ज्ञान, सिप, प्रवृत्ति तथा पेसागत र व्यवस्थापकीय क्षमताको विकास र प्रयोग
१०. उच्च तहमा अध्ययनका लागि विषयगत/विधागत आधार विकास

६. विद्यालय शिक्षाको पाठ्यक्रम संरचना

विद्यालय शिक्षाको पाठ्यक्रम संरचना निम्नानुसार प्रस्तुत गरिएको छ :

(क) प्रारम्भिक बालविकास तथा शिक्षा

प्रारम्भिक बालविकास तथा शिक्षा पाठ्यक्रमको मुख्य लक्ष्य बालबालिकाको सर्वाङ्गीण विकास गर्नु र उनीहरूलाई सिकाइप्रति प्रेरित गरी सिकाइका लागि आधारशिला खडा गर्नु हुने छ । प्रारम्भिक बालविकास र शिक्षाको पाठ्यक्रम ४ वर्षका बालबालिकाको उमेरगत विकासका पक्षलाई ध्यान दिई एकीकृत सिद्धान्तानुसार विकास गरिने छ । यसमा उमेरानुसारका शारीरिक, संवेगात्मक, सामाजिक, सांस्कृतिक, नैतिक, बौद्धिक तथा मानसिक, स्वास्थ्य, पोषण, सुरक्षा तथा वातावरण र सिर्जनात्मक सिपहरू विकास गराउनाका साथै मौखिक भाषिक सिप, पूर्वसङ्ख्या वा पूर्वगणितीय सिपलगायतका सिप विकास गराइन्छ । यस तहमा औपचारिकरूपमा पढाइ र लेखाइका सिप तथा क्रियाकलाप भने उमेरमा दृष्टिले समावेश गरिनु हुन्छ ।

(ख) आधारभूत शिक्षा

(अ) आधारभूत शिक्षा (कक्षा १-३)

आधारभूत शिक्षा (कक्षा १-३) मा एकीकृत स्वरूपको पाठ्यक्रम हुने छ । सिकाइका क्षेत्रहरू (Themes) पहिचान गरी विषय र सिकाइका क्षेत्रका आधारमा बहुविषयात्मक (Multidisciplinary) तथा अन्तरविषयगत (Interdisciplinary) ढाँचामा पाठ्यक्रम आधारित गरिने छ । यसअनुसार एकीकृत विषयक्षेत्रहरूले समेट्न नसकेका सिकाइ उपलब्धिहरूलाई समेट्ने गरी विषयगत सिकाइ क्षेत्रहरूसमेत रहन सक्ने छन् । भाषागत विषयसँग सम्बन्धित विषयक्षेत्रहरू पठनपाठन सम्बन्धित भाषामा नै गर्नुपर्ने छ । यस तहमा बालबालिकाहरूले आफ्नो मातृभाषामा सिक्ने अवसर प्राप्त गर्ने छन् । यस्तो पाठ्यक्रम क्रियाकलापमुखी हुने छ । यसले विद्यार्थीहरूमा विषयवस्तुको ज्ञानका साथै विभिन्न किसिमका व्यवहारकुशल सिप विकासमा जोड दिने छ । यस तहमा बालबालिकाहरूले आफ्नो मातृभाषामा सिक्ने अवसर प्राप्त गर्ने छन् । आधारभूत तह (कक्षा १-३) मा भाषा, गणित, विज्ञान, स्वास्थ्य र शारीरिक शिक्षा, सामाजिक अध्ययन, सिर्जनात्मक कला, मातृभाषा तथा स्थानीय विषयका सिकाइ क्षेत्रहरू रहे पनि एकीकृत सिद्धान्तानुसार नेपाली, गणित, अङ्ग्रेजी, हाम्रो सेरोफेरो र मातृभाषा/स्थानीय विषयक्षेत्रमा उल्लिखित सबै विषयलाई समावेश गरिएको छ ।

(आ) आधारभूत शिक्षा (कक्षा ४-५)

आधारभूत शिक्षा (कक्षा ४-५) मा विद्यार्थीहरूलाई भाषा, गणित, विज्ञान तथा प्रविधि, सामाजिक अध्ययन तथा मानवमूल्य शिक्षा, स्वास्थ्य, शारीरिक तथा सिर्जनात्मक कला, मातृभाषा तथा स्थानीय विषयका सिकाइ क्षेत्रहरू प्रदान गरिने छ । दैनिक जीवनका लागि आवश्यक अन्तरव्यक्तिक सिपहरू, स्वसचेतना सिपहरू, समालोचनात्मक तथा सिर्जनात्मक सोचाइका सिपहरू, निर्णय गर्ने सिपहरू, सूचना प्रविधिसम्बन्धी सिपहरू र नागरिक चेतनासम्बन्धी सिपहरू एकीकृत गरी पाठ्यक्रम विकास गरिने छ ।

(इ) आधारभूत शिक्षा (कक्षा ६-८)

आधारभूत शिक्षा (कक्षा ६-८) मा विद्यार्थीहरूलाई भाषा, गणित, विज्ञान तथा प्रविधि, सामाजिक, वातावरण, जनसङ्ख्या, मानवमूल्य, स्वास्थ्य शारीरिक तथा स्थानीय विषयका सिकाइ क्षेत्रहरू नै प्रदान गरिने छ । स्थानीय आवश्यकतामा आधारित अध्ययनअन्तर्गत विद्यार्थीहरूलाई मातृभाषा वा स्थानीय कला, संस्कृति, सिप, संस्कृत भाषा जस्ता विषयवस्तु समावेश गर्न सकिने छ । दैनिक जीवनका लागि आवश्यक अन्तरवैयक्तिक सिपहरू, स्वसचेतना सिपहरू, समालोचनात्मक तथा सिर्जनात्मक सोचाइका सिपहरू, निर्णय गर्ने सिपहरू, सूचना प्रविधिसम्बन्धी सिपहरू र नागरिक चेतनासम्बन्धी सिपहरू एकीकृत गरी पाठ्यक्रम विकास गरिने छ । कक्षा ६-८ मा संस्कृत/गुरुकुल/वेद विद्याश्रम शिक्षाका लागि भने विषय संरचनामा केही भिन्नता हुने छ ।

(ख) माध्यमिक शिक्षा

विद्यालय शिक्षामा कक्षा ९ देखि १२ सम्मलाई माध्यमिक शिक्षा कायम गरिएको छ । माध्यमिक शिक्षालाई साधारण, प्राविधिक तथा व्यावसायिक र परम्परागत गरी तीन प्रकारमा वर्गीकरण गरिएको छ । गुरुकुल, गोन्पा विहार, मदर्सा, मुन्धुमलगायतका परम्परागत शिक्षा पद्धतिलाई पनि माध्यमिक शिक्षामा समेटिएको छ । माध्यमिक शिक्षाको पाठ्यक्रम संरचना एकलपथको हुने छ । कक्षा ९ र १० को साधारण धारतर्फ प्रत्येक कक्षामा नेपाली, अङ्ग्रेजी, गणित, विज्ञान तथा प्रविधि र सामाजिक अध्ययन गरी पाँचओटा अनिवार्य विषयहरू र दुईओटा ऐच्छिक विषयहरू रहने छन् । यसै गरी कक्षा ११ र १२ को साधारण शिक्षातर्फ अनिवार्य विषयका रूपमा अङ्ग्रेजी र नेपालीलाई दुवै कक्षामा, सामाजिक अध्ययनलाई कक्षा ११ मा र जीवनोपयोगी शिक्षालाई कक्षा १२ मा समावेश गरिएको छ भने कक्षा ११ र १२ प्रत्येकमा ऐच्छिक विषय तीन तीनओटा समावेश गरिएको छ । यसको अतिरिक्त कक्षा ११ र १२ मा अतिरिक्त ऐच्छिक विषयका रूपमा थप एक विषय समावेश गर्न सकिने छ । त्यसै गरी माध्यमिक शिक्षातर्फ कक्षा ११ र १२ मा सामाजिक अध्ययन र जीवनोपयोगी शिक्षा विषयअन्तर्गत न्यूनतम एक पाठ्यघण्टा बराबरको सूचना प्रविधिसम्बन्धी विषयवस्तु समावेश गरिने छ । माध्यमिक शिक्षा कक्षा ११-१२ को पाठ्यक्रम संरचना निम्नानुसार हुने छ :

(अ) साधारण शिक्षा

माध्यमिक शिक्षा (कक्षा ९- १०)

क्र. स.	विषय	पाठ्य घण्टा (Credit hour)	वार्षिक कार्यघण्टा
१.	नेपाली	५	१६०
२.	अङ्ग्रेजी	५	१६०
३.	गणित	५	१६०
४.	विज्ञान तथा प्रविधि	५	१६०
५.	सामाजिक अध्ययन	४	१२८
६.	ऐच्छिक प्रथम	४	१२८
७.	ऐच्छिक द्वितीय	४	१२८
जम्मा		३२	१०२४

माध्यमिक शिक्षा (कक्षा ११ - १२)

क्र.सं.	विषय	कक्षा ११		कक्षा १२	
		पाठ्यघण्टा (Credit hour)	वार्षिक कार्यघण्टा	पाठ्यघण्टा (Credit hour)	वार्षिक कार्यघण्टा
१.	नेपाली	३	९६	३	९६
२.	अङ्ग्रेजी	४	१२८	४	१२८
३.	सामाजिक अध्ययन तथा जीवनोपयोगी शिक्षा	५	१६०	५	१६०
४.	ऐच्छिक प्रथम	५	१६०	५	१६०

५.	ऐच्छिक द्वितीय	५	१६०	५	१६०
६.	ऐच्छिक तृतीय	५	१६०	५	१६०
जम्मा		२७	८६४	२७	८६४
७.	थप ऐच्छिक	५	१६०	५	१६०

द्रष्टव्य :

- ऐच्छिक तीन विषयहरूको छनोट विद्यार्थीको रुचि, आवश्यकता, उपलब्ध शिक्षक तथा स्रोतसाधनका आधारमा स्थानीय सरकारको समन्वय र सहजीकरणमा विद्यालयले गर्ने छ । यसरी विषय छनोट गर्दा ऐच्छिक प्रथम, द्वितीय, तृतीय र चतुर्थ समूहमध्ये कुनै तीन समूहबाट एक एक विषय गरी जम्मा तीन विषय छनोट गर्नुपर्ने छ । विद्यार्थीले बाँकी रहेको ऐच्छिक समूहबाट कक्षा ११ र १२ प्रत्येकमा एक विषय थप ऐच्छिकका रूपमा अध्ययन गर्न सक्ने छन् । सामान्यतया ऐच्छिक विषय छनोट गर्दा कक्षा ११ मा अध्ययन गरेको विषय वा सो विषयसँग सम्बन्धित विषय कक्षा १२ मा लिनुपर्ने छ । कक्षा ११ मा अध्ययन गरेको विषय वा सो विषयसँग सम्बन्धित विषय कक्षा १२ मा नभएमा सोही समूहबाट सट्टामा तोकिएको विषय लिनुपर्ने छ । विषय छनोटका लागि पाठ्यक्रम विकास केन्द्रले आवश्यक मार्गदर्शन विकास गर्न सक्ने छ ।
- विदेशी विद्यार्थीहरूका लागि अनिवार्य नेपाली विषयको सट्टा वैकल्पिक अङ्ग्रेजी (Alternative English Eng. 333-334) विषय अध्ययन गर्न पाउने व्यवस्था गर्न सकिने छ ।

(आ) परम्परागत शिक्षा : संस्कृत/वेद विद्याभ्रम/गुरुकुल शिक्षा

माध्यमिक शिक्षा (कक्षा ९- १०)

क्र.स.	विषय	पाठ्यघण्टा (Credit hour)	वार्षिक कार्यघण्टा
१.	नेपाली	५	१६०
२.	अङ्ग्रेजी/संस्कृत रचना	५	१६०
३.	गणित	५	१६०
४.	वेद वा नीतिशास्त्र वा विज्ञान तथा प्रविधि	५	१६०
५.	संस्कृत भाषा तथा व्याकरण	४	१२८
६.	ऐच्छिक प्रथम	४	१२८
७.	ऐच्छिक द्वितीय	४	१२८
जम्मा		३२	१०२४

द्रष्टव्य :

- वेद भन्नाले शुक्लयजुर्वेद वा सामवेद वा ऋग्वेद वा अथर्ववेदमध्ये कुनै एक विषय छनोट गर्नुपर्ने छ ।
- ऐच्छिक प्रथम विषयमा कर्मकाण्ड, फलित ज्योतिष, योग शिक्षा, वास्तुशास्त्र, आयुर्वेद, प्राकृतिक चिकित्सा र ऐच्छिक गणित विषयमध्ये एक विषय छनोट गर्नुपर्ने छ ।
- ऐच्छिक द्वितीय पत्रमा संस्कृतका शास्त्रीय विषयमध्ये कुनै एक विषय छनोट गर्नुपर्ने छ । तर विज्ञान तथा प्रविधि विषयको सट्टामा वेद विषयको छनोट गरेमा ऐच्छिक द्वितीयमा वेद विषय छनोट गर्न पाइने छैन ।

माध्यमिक शिक्षा कक्षा ११-१२

क्र. सं.	विषय	कक्षा ११		कक्षा १२	
		पाठ्यघण्टा (Credit hour)	वार्षिक कार्यघण्टा	पाठ्यघण्टा (Credit hour)	वार्षिक कार्यघण्टा
१.	नेपाली	३	९६	३	९६
२.	अङ्ग्रेजी वा संस्कृत रचना	४	१२८	४	१२८
३.	सामाजिक अध्ययन तथा जीवनोपयोगी शिक्षा	५	१६०	५	१६०
४.	संस्कृत भाषा तथा व्याकरण	५	१६०	५	१६०
५.	ऐच्छिक प्रथम	५	१६०	५	१६०

६.	ऐच्छिक द्वितीय	५	१६०	५	१६०
जम्मा		२७	८६४	२७	८६४
७.	थप ऐच्छिक	५	१६०	५	१६०

द्रष्टव्य :

१. उल्लिखित विषय बाहेक कक्षा ११ र १२ प्रत्येक कक्षामा सामाजिक अध्ययन तथा जीवनोपयोगी शिक्षाअन्तर्गत एक एक पाठ्यघण्टाको सूचना प्रविधिको व्यावहारिक अभ्यास समावेश गरिने छ ।
२. विद्यार्थीले कक्षा ११ र १२ प्रत्येक कक्षामा ५ पाठ्यघण्टाको थप ऐच्छिक विषय एक अध्ययन गर्न सक्ने छन् । थप ऐच्छिक विषयको विवरण यसै खण्डमा दिइएको छ ।

(इ) परम्परागत शिक्षा: गोन्पा/मदसाँ

माध्यमिक शिक्षा (कक्षा ९- १०)

क्र.स.	विषय	पाठ्यघण्टा (Credit hour)	वार्षिक कार्यघण्टा
१.	नेपाली	५	१६०
२.	अङ्ग्रेजी	५	१६०
३.	गणित	५	१६०
४.	विज्ञान तथा प्रविधि	५	१६०
५.	सामाजिक अध्ययन	४	१२८
६.	ऐच्छिक प्रथम	४	१२८
७.	ऐच्छिक द्वितीय	४	१२८
जम्मा		३२	१०२४

द्रष्टव्य :

१. सामाजिक अध्ययन विषयलाई सम्बन्धित परम्परागत शिक्षा विषयको विषयवस्तुलाई समेत अनुकूलन गरी सम्बन्धित भाषामा नै पठनपाठन गर्न सकिने छ ।
२. गोन्पा शिक्षाको ऐच्छिक विषयको रूपमा साधारण शिक्षाका ऐच्छिक विषयका अतिरिक्त भोट भाषा र बौद्ध शिक्षा पठनपाठन गर्न सकिने छ ।
३. मदसाँ शिक्षाको ऐच्छिक विषयका रूपमा साधारण शिक्षाको ऐच्छिक विषयका अतिरिक्त अरेबिक भाषा साहित्य र व्याकरण, उर्दू भाषा साहित्य र व्याकरण एवम् दिनियात विषय पठनपाठन गर्न सकिने छ ।
४. मदसाँतर्फ अङ्ग्रेजी विषयका सट्टामा अरबी साहित्य र विज्ञान तथा प्रविधि विषयका सट्टामा सिरत र इस्लामी विषय पठनपाठन गराउन सकिने छ ।

माध्यमिक शिक्षा (कक्षा ११- १२)

क्र.स.	विषय	कक्षा ११		कक्षा १२	
		पाठ्यघण्टा (Credit hour)	वार्षिक कार्यघण्टा	पाठ्यघण्टा (Credit hour)	वार्षिक कार्यघण्टा
१.	नेपाली	३	९६	३	९६
२.	अङ्ग्रेजी वा बौद्ध शिक्षा वा उर्दू व्याकरण र साहित्य	४	१२८	४	१२८
३.	सामाजिक अध्ययन तथा जीवनोपयोगी शिक्षा	५	१६०	५	१६०
४.	ऐच्छिक प्रथम (बौद्ध दर्शन वा	५	१६०	५	१६०

	कुरान)				
५.	ऐच्छिक द्वितीय (ज्योतिष, भैषज्य, शिल्प विद्या, बौद्ध कर्मकाण्ड, कम्प्युटर)वा (हदिस र असुले हदिस)	५	१६०	५	१६०
६.	ऐच्छिक तृतीय (अङ्ग्रेजी, जापानिज, चाइनिज, पाली भाषा, भोट भाषा, संस्कृत रचना)/ (मिरास विज्ञान)	५	१६०	५	१६०
जम्मा		२७	८६४	२७	८६४
७.	थप ऐच्छिक	५	१६०	५	१६०

द्रष्टव्य :

१. इच्छुक विद्यार्थीले कक्षा ११ र १२ प्रत्येक कक्षामा ५ पाठ्यघण्टाको थप ऐच्छिक विषय एक अध्ययन गर्न सक्ने छन् । थप ऐच्छिक विषय साधारण धारतर्फका ऐच्छिक समूहबाट छनोट गर्नुपर्ने छ ।
२. प्राविधिक तथा व्यावसायिक धारतर्फको पाठ्यक्रम संरचना तथा विषयहरूको विवरण पाठ्यक्रमको यस खण्डमा समावेश नगरी माध्यमिक शिक्षा (प्राविधिक तथा व्यावसायिक) पाठ्यक्रममा समावेश गरिने छ ।

६. कक्षा ११ र १२ मा पठनपाठन हुने अनिवार्य विषय, ऐच्छिक विषयको छनोटका लागि विषयगत समूह तथा विषयको कोड

(क) अनिवार्य विषय

सि. नं.	कक्षा ११ का विषय र कोड	कक्षा १२ का विषय र कोड
१	नेपाली [Nep. 001]	नेपाली [Nep. 002]
२	English [Eng. 003]	English [Eng. 004]
३	सामाजिक अध्ययन तथा जीवनोपयोगी शिक्षा [Sol. 005]	सामाजिक अध्ययन तथा जीवनोपयोगी शिक्षा [Sol. 006]

(ख) ऐच्छिक विषय

(अ) ऐच्छिक पहिलो समूह

क्र.स.	कक्षा ११ का ऐच्छिक विषय र कोड	कक्षा १२ का ऐच्छिक विषय र कोड
१.	भौतिक विज्ञान (Physics) [Phy. 101]	भौतिक विज्ञान (Physics) [Phy. 102]
२.	लेखाविधि (Accounting) [Acc. 103]	लेखाविधि (Accounting) [Acc. 104]
३.	ग्रामीण विकास (Rural Development) [Rud. 105]	ग्रामीण विकास (Rural Development) [Rud. 106]
४	विधिशास्त्र र कानुनी सिद्धान्त (Jurisprudence and Legal Theories [Jlt. 107]	नेपालको न्याय र कानून प्रणाली (Nepali Legal system) [Nls. 110]
५.	स्वास्थ्य तथा शारीरिक शिक्षा (Health and Physical Education) [Hpe. 111]	स्वास्थ्य तथा शारीरिक शिक्षा (Health and Physical Education) [Hpe.112]
६	खेलकुद विज्ञान (Sports Science) [Sps. 113]	खेलकुद विज्ञान (Sports Science) [Sps.114]

७	बालविकास र सिकाइ (Child Development and Learning) [Cdl. 115]	शैक्षणिक पद्धति र मूल्याङ्कन (Instructional Pedagogy and Evaluation) [Ipe. 118]
८	मनोविज्ञान (Psychology) [Psy. 119]	मनोविज्ञान (Psychology) [Nls. 120]
९	इतिहास (History) [His. 121]	इतिहास (History) [His. 122]
१०	लैङ्गिक अध्ययन (Gender Studies) [Ges. 123]	लैङ्गिक अध्ययन (Gender Studies) [Ges. 124]
११	अतिथि सत्कार व्यवस्थापन (Hospitality Management) [Hom. 125]	अतिथि सत्कार व्यवस्थापन (Hospitality Management) [Hom. 126]
१२	बाली विज्ञान (Agronomy) [Agr. 127]	बाली विज्ञान (Agronomy) [Agr. 128]
१३	प्राकृतिक चिकित्सा (Naturopathy) [Nat. 129]	प्राकृतिक चिकित्सा (Naturopathy) [Nat. 130]
१४	मानवमूल्य शिक्षा (Human Value Education) [Hve. 131]	मानवमूल्य शिक्षा (Human Value Education) [Hve. 132]
१५	मूर्तिकला (Sculpture) [Scu. 133]	मूर्तिकला(Sculpture) [Scu. 134]

(आ) ऐच्छिक दोस्रो समूह

क्र.स.	कक्षा ११ का ऐच्छिक विषय र कोड	कक्षा १२ का ऐच्छिक विषय र कोड
१.	जीव विज्ञान (Biology) [bio. 201]	जीव विज्ञान (Biology) [bio. 202]
२.	शिक्षा र विकास (Education and Development) [Ed 203]	शिक्षा र विकास (Education and Development) [Ed 204]
३	भूगोल (Geography) [Geo. 205]	भूगोल (Geography) [Geo. 206]
४.	कार्यविधि कानून (Procedural Law) [PrL. 207]	कानूनको मस्यौदा प्रक्रिया (Legal Drafting) [Led. 210]
५	समाजशास्त्र (Sociology) [Soc. 211]	समाजशास्त्र (Sociology) [Soc. 212]
६	आयुर्वेद (Ayurved) [Ayu. 213]	आयुर्वेद (Ayurved) [Ayu. 214]
७	व्यवसाय अध्ययन (Business Studies) [Bus. 215]	व्यवसाय अध्ययन (Business Studies) [Bus. 216]
८	भाषा विज्ञान (Linguistics) [Lin. 217]	भाषा विज्ञान (Linguistics) [Lin. 218]
९	राजनीति शास्त्र (Political Science) [Pol. 219]	राजनीति शास्त्र (Political Science) [Pol. 220]
१०	दर्शनशास्त्र (Philosophy) [Phi. 221]	दर्शनशास्त्र (Philosophy) [Phi. 222]
११	जनसङ्ख्या अध्ययन (Population Studies) [Pos. 223]	जनसङ्ख्या अध्ययन (Population Studies) [Pos. 224]
१२	बागवानी (Horticulture) (फलफूल, तरकारी, पुष्प र च्याउ खेती) [Hor. 225]	बागवानी (Horticulture) (फलफूल, तरकारी, पुष्प र च्याउ खेती) [Hor. 226]
१३	खाद्य र पोषण (Food and Nutrition) [Fon. 227]	खाद्य र पोषण (Food and Nutrition) [Fon. 228]

१४	नृत्य (Dance) [Dan. 229]	नृत्य (Dance) [Dan. 230]
१५	कम्प्यूटर विज्ञान (Computer Science) [Com. 231]	कम्प्यूटर विज्ञान (Computer Science) [Com. 232]

(इ) ऐच्छिक तेषो समूह

क्र.स.	कक्षा ११ का ऐच्छिक विषय र कोड	कक्षा १२ का ऐच्छिक विषय र कोड
१.	रसायन विज्ञान (Chemistry) [Che. 301]	रसायन विज्ञान (Chemistry) [Che. 302]
२	अर्थशास्त्र (Economics) [Eco. 303]	अर्थशास्त्र (Economics) [Eco. 304]
३	पर्यटन र पर्वतारोहण अध्ययन (Tourism and Mountaineering Studies) [Tms. 305]	पर्यटन र पर्वतारोहण अध्ययन (Tourism and Mountaineering Studies) [Tms. 306]
४	बजारशास्त्र (Marketing) [Mar. 307]	बजारशास्त्र (Marketing) [Mar.308]
५	बुद्धयौली तथा स्याहार शिक्षा (Gerontology and Care Taking Education) [Gct. 309]	बुद्धयौली तथा स्याहार शिक्षा (Gerontology and Care Taking Education) [Gct. 310]
६	योग (Yog) [Yog. 311]	योग (Yog) [Yog. 312]
७	वाद्यवादन (Vocal/Instrumental) [Voc. 313]	वाद्यवादन (Vocal/Instrumental) [voc. 314]
८	सिलाइ तथा बुनाइ (Sewing and Knitting) [Sek. 315]	सिलाइ तथा बुनाइ (Sewing and Knitting) [Sek. 316]
९	संवैधानिक कानून (Constitutional Law) [Col. 317]	देवानी तथा फौजदारी कानून र न्याय (Civil and Criminal law and justice) [Ccl. 320]
१०	पाककला (Culinary Arts) [Cua. 321]	पाककला (Culinary Arts) [Cua. 322]
११	संस्कृति (Culture) [Cul. 323]	संस्कृति (Culture) [Cul. 324]
१२	फेशन डिजाइनिङ (Fashion Designing) [Fad. 325]	फेशन डिजाइनिङ (Fashion Designing) [Fad. 326]
१३	सिनेमा तथा डकुमेन्ट्री (Film and Documentry) [Fid. 327]	सिनेमा तथा डकुमेन्ट्री (Film and Documentry) [Fid. 328]
१४	पशुपालन, पन्छीपालन र माछापालन (Livestock, Poultry and Fisheries) [Lpf. 329]	पशुपालन, पंक्षीपालन र माछापालन (Livestock, Poultry and Fisheries) [Lpf. 330]
१५	नेपाली (Nepali) [Nep. 331]	नेपाली (Nepali) [Nep. 332]
१६	अङ्ग्रेजी (English) [Eng. 333]	अङ्ग्रेजी (English) [Eng. 334]
१७	मैथिली [Mai. 335]	मैथिली [Mai. 336]
१८	नेवारी [New 337]	नेवारी [New. 338]
१९	हिन्दी [Hin. 339]	हिन्दी [Hin. 340]
२०	चिनियाँ [Chi. 341]	चिनियाँ [Chi. 342]
२१	जर्मन [Jer. 343]	जर्मन [Jer. 344]

२२	जापानिज [Jap. 345]	जापानिज [Jap 346]
२३	कोरियन [Kor. 347]	कोरियन [Kor.348]
२४	उर्दू [Urd. 349]	उर्दू [Urd. 352]
२५	फ्रेन्च [Fre. 353]	फ्रेन्च [Fre. 354]
२६	हिब्रू [Heb. 355]	हिब्रू [Heb. 356]
२७	अरेबिक [Are. 357]	अरेबिक [Are.358]
२८	संस्कृत [San. 359]	संस्कृत [San. 360]

(ई) ऐच्छिक चौथो समूह

क्र. स.	कक्षा ११ का ऐच्छिक विषय र कोड	कक्षा १२ का ऐच्छिक विषय र कोड
१.	गणित (Mathematics) [Mat. 401]	गणित (Mathematics) [Mat. 402]
२.	प्रायोगिक गणित (Applied mathematics) [Ama. 403]	प्रायोगिक गणित (Applied Mathematics) [Ama. 404]
३.	वाणिज्य गणित (Business Mathematics) [Bmt. 405]	वाणिज्य गणित (Business Mathematics) [Bmt. 406]
४	मानव अधिकार (Human rights) [Hur. 407]	मानव अधिकार (Human rights) [Hur. 408]
५	पुस्तकालय तथा सूचना विज्ञान (Library and Information Science) [Lis. 409]	पुस्तकालय तथा सूचना विज्ञान (Library and Information science) [Lis. 410]
६	गृह विज्ञान (Home Science) [Hos. 411]	गृह विज्ञान (Home Science) [Hos. 412]
७	वातावरण विज्ञान (Environment Science) [Ens. 413]	वातावरण विज्ञान (Environment Science) [Ens.414]
८	साधारण कानून (General Law) [Gel. 415]	साधारण कानून (General Law) [Gel.416]
९	वित्तशास्त्र (Finance) [Fin. 417]	वित्तशास्त्र (Finance) [Fin. 418]
१०	सहकारी व्यवस्थापन (Co-operative management) [Com. 419]	सहकारी व्यवस्थापन (Co-operative Management) [Urd. 420]
११	बौद्ध अध्ययन (Buddhist Studies) [Bud. 421]	बौद्ध अध्ययन (Buddhist Studies) [Bud.422]
१२	प्रायोगिक कला (Applied Arts) [Apa. 423]	प्रायोगिक कला (Applied Arts) [Apa. 424]
१३	गायन (Signing) [Sig. 425]	गायन (Signing) [Sig. 426]
१४	चित्रकला (Painting) [Pai. 427]	चित्रकला (Painting) [Pai.428]
१५	रेसम खेती र मौरीपालन (Apiculture and Sericulture) [Aps. 429]	रेसम खेती र मौरीपालन (Apiculture and Sericulture) [Aps. 430]
१६	सौन्दर्यकला र केशकला (Beautician and Hair Dressing) [Beh. 431]	सौन्दर्यकला र केशकला (Beautician and Hair Dressing) [Beh.432]
१७	जडीबुटी (Herbals) [Hrb. 433]	जडीबुटी (Herbals) [Hrb.434]
१८	प्लम्बिङ र वाइरिङ (Plumbing and Wiring) [Plw. 435]	प्लम्बिङ र वाइरिङ (Plumbing and Wiring) [Plw. 436]

१९	आन्तरिक सजाबट (Internal Decoration) [Ind. 437]	आन्तरिक सजाबट (Internal Decoration) [Ind. 438]
२०	होटेल व्यवस्थापन (Hotel Management) [Hom. 439]	होटेल व्यवस्थापन (Hotel Management) [Hom. 440]
२१.	आमसञ्चार (Mass Communication) [Mac. 441]	आमसञ्चार (Mass Communication) [Mac.442]

माध्यमिक शिक्षा (कक्षा ११-१२) संस्कृततर्फका विषय

(क) अनिवार्य विषय

सि. नं.	कक्षा ११ का विषय र कोड	कक्षा १२ का विषय र कोड
१	संस्कृत रचना [Saw. 011]	संस्कृत रचना [Saw. 012]
२	संस्कृत भाषा तथा व्याकरण [Slg. 017]	संस्कृत भाषा तथा व्याकरण [Slg. 018]

द्रष्टव्य : अनिवार्य विषयहरू नेपाली [Nep. 001 र Nep. 002], अङ्ग्रेजी [Eng. 003 र Eng. 004], सामाजिक अध्ययन [Soc. 005], जीवनोपयोगी शिक्षा [Lif. 008] साधारण धारमै उल्लेख भएअनुसार हुनेछन् । विद्यार्थीले अङ्ग्रेजी [Eng. 003 र Eng. 004] को सट्टा संस्कृत रचना [Saw. 011 र Saw. 012] विषय अध्ययन गर्न सक्नेछन् ।

(ख) ऐच्छिक विषय

(अ) ऐच्छिक पहिलो समूह

क्र. स.	कक्षा ११ का ऐच्छिक विषय र कोड	कक्षा १२ का ऐच्छिक विषय र कोड
१	शुक्लयजुर्वेद [Yab 501]	शुक्लयजुर्वेद [Yab. 502]
२	सामवेद [Sab. 503]	सामवेद [Sab. 504]
३	ऋग्वेद [Rib. 505]	ऋग्वेद [Rib. 506]
४	अथर्ववेद [Aab. 507]	अथर्ववेद [Aab. 508]
५	व्याकरण [Gra. 509]	व्याकरण [Gra. 510]
६	सिद्धान्त ज्योतिष [Sij. 511]	सिद्धान्त ज्योतिष [Sij. 512]
७	न्याय [Nay. 513]	न्याय [Nay. 514]
८	दर्शनशास्त्र [Dar. 515]	दर्शनशास्त्र [Dar. 516]
९	संस्कृत साहित्य [Sas. 517]	संस्कृत साहित्य [Sas. 518]
१०	इतिहास पुराण [Itp. 519]	इतिहास पुराण [Itp. 520]
११	नीतिशास्त्र [Nis. 521]	नीतिशास्त्र [Nis. 522]

(आ) ऐच्छिक दोस्रो समूह

क्र. स.	कक्षा ११ का ऐच्छिक विषय र कोड	कक्षा १२ का ऐच्छिक विषय र कोड
१	प्राकृतिक चिकित्सा (Naturopathy) [Nat. 129]	प्राकृतिक चिकित्सा (Naturopathy) [Nat. 130]
२	आयुर्वेद (Ayurved) [Ayu. 213]	आयुर्वेद (Ayurved) [Au. 214]
३	योग (Yog) [yog. 311]	योग (Yog) [Yog. 312]
४	कर्मकाण्ड [Kar. 531]	कर्मकाण्ड [Kar. 532]
५	फलित ज्योतिष [Faj.533]	फलित ज्योतिष [Faj.534]
६	वास्तुशास्त्र [Ba 537]	वास्तुशास्त्र [Bas. 538]

(इ) थप ऐच्छिक विषय

क्र. स.	कक्षा ११ का ऐच्छिक विषय र कोड	कक्षा १२ का ऐच्छिक विषय र कोड
१	मानवमूल्य शिक्षा (Human Value Education) [Hve. 131]	मानवमूल्य शिक्षा (Human Value Education) [Hve. 132]
२	कम्प्युटर विज्ञान (Computer Science) [Com. 231]	कम्प्युटर विज्ञान (Computer Science) [Com. 232]
३	अर्थशास्त्र (Economics) [Eco. 303]	अर्थशास्त्र (Economics) [Eco. 304]
४	नेपाली (Nepali) [Nep. 331]	नेपाली (Nepali) [Nep. 332]
५	अङ्ग्रेजी (English) [Eng. 333]	अङ्ग्रेजी (English) [Eng. 334]
६	गणित (Mathematics) [Mat. 401]	गणित (Mathematics) [Mat. 402]

परम्परागत शिक्षा: गोन्या/मदर्स

(क) अनिवार्य विषय

सि. नं.	कक्षा ११ का विषय र कोड	कक्षा १२ का विषय र कोड
१	बौद्ध शिक्षा [Bue. 021]	बौद्ध शिक्षा [Bue. 022]
२	उर्दू व्याकरण र साहित्य [Ugl. 031]	उर्दू व्याकरण र साहित्य [Ugl. 032]

द्रष्टव्य : अनिवार्य विषयहरू नेपाली [Nep. 001 र Nep. 002], अङ्ग्रेजी [Eng. 003 र Eng. 004], सामाजिक अध्ययन [Soc. 005], जीवनोपयोगी शिक्षा [Lif. 008] साधारण धारमै उल्लेख भएअनुसार हुनेछन् । विद्यार्थीले अङ्ग्रेजी [Eng. 003 र Eng. 004] को सट्टा गोन्यामा बौद्ध शिक्षा [Bue. 021 / Bue 022] र मदर्समा उर्दू व्याकरण र साहित्य [Ugl. 031, Ugl 032] विषय अध्ययन गर्न सक्नेछन् ।

(ख) ऐच्छिक विषय

(अ) ऐच्छिक पहिलो समूह

क्र. स.	कक्षा ११ का ऐच्छिक विषय र कोड	कक्षा १२ का ऐच्छिक विषय र कोड
१	बौद्ध दर्शन [Bup.601]	बौद्ध दर्शन [Bup.602]
२	कुरान [Kur. 611]	कुरान [Kur. 612]

(आ) ऐच्छिक दोस्रो समूह

क्र. स.	कक्षा ११ का ऐच्छिक विषय र कोड	कक्षा १२ का ऐच्छिक विषय र कोड
१	कम्प्युटर विज्ञान [Com.231]	कम्प्युटर [Com. 232]
२	बौद्ध कर्मकाण्ड [Bkk. 527]	बौद्ध कर्मकाण्ड [Bkk. 628]
३	ज्योतिष [Jyo.621]	ज्योतिष [Jyo.622]
४	भैषज्य [Bha. 623]	भैषज्य [Kur. 624]
५	शिल्प विद्या [Sil. 625]	शिल्प विद्या [Sil. 626]
६	हदिस र असुले हदिस [Hah. 651]	हदिस र असुले हदिस [Hah. 652]

(इ) ऐच्छिक तेस्रो समूह

क्र. स.	कक्षा ११ का ऐच्छिक विषय र कोड	कक्षा १२ का ऐच्छिक विषय र कोड
१	संस्कृत रचना [Saw. 011]	संस्कृत रचना [Saw. 012]
२	अङ्ग्रेजी [Eng. 333]	अङ्ग्रेजी [Eng. 334]
३	चिनियाँ भाषा [Chi. 341]	चिनियाँ भाषा [Chi. 342]
४	जापानिज भाषा [Jap. 345]	जापानिज भाषा [Jap 346]
५	पाली भाषा [Pal. 631]	पाली भाषा [Pal. 632]
६	भोट भाषा [Bht. 633]	भोट भाषा [Bht. 634]
७	मिरास विज्ञान [Mir. 661]	मिरास विज्ञान [Mir.662]

७. पठनपाठनको समयावधि

१. प्रारम्भिक बालविकास तथा शिक्षाका लागि एक शैक्षिक सत्रमा वार्षिक जम्मा ५७६ घण्टा दैनिक सिप सिकाइ क्रियाकलाप र विषयगत सिप सिकाइ क्रियाकलाप सञ्चालन हुने छ । यसै गरी वार्षिक २५६ घण्टासम्म मनोरञ्जन, बाह्य खेल र आराम गर्ने तथा खाजा खाने समय हुने छ । उक्त समयले बालबालिकाले प्रारम्भिक बालविकास केन्द्रमा बिताउने पूरा अवधिलाई बुझाउँछ ।
२. विद्यालय शिक्षाको सबै कक्षाका लागि एक शैक्षिक वर्षमा कम्तीमा २०५ दिन पठनपाठन सञ्चालन हुने छ ।
३. कक्षा १ देखि ३ सम्म जम्मा २६ पाठ्यघण्टा अर्थात् वार्षिक ८३२ कार्यघण्टाको पठनपाठन गर्नुपर्ने छ ।
४. कक्षा ४ देखि १० सम्म जम्मा ३२ पाठ्यघण्टा अर्थात् वार्षिक १०२४ कार्यघण्टा र कक्षा ११ र १२ मा कम्तीमा २७ पाठ्यघण्टा अर्थात् ८६४ कार्यघण्टादेखि बढीमा ३२ पाठ्यघण्टा अर्थात् १०२४ कार्यघण्टा पठनपाठन गर्नुपर्ने छ ।
५. पठनपाठन सञ्चालनका लागि खर्च भएको ३२ घण्टाको समयावधिलाई १ पाठ्यघण्टा मानिने छ ।
६. सामान्यतया प्रतिदिन प्रतिविषय एक घण्टाको एक पिरियड हुने छ । तर तोकिएको पाठ्यघण्टा (Credit hour) नघट्टने गरी विद्यालयले विषयको आवश्यकताअनुसार साप्ताहिक कार्यतालिकाको समयावधि निर्धारण गरी कक्षा सञ्चालन गर्नुपर्ने छ ।

८. सिकाइ सहजीकरण प्रक्रिया

१. माध्यमिक शिक्षामा शिक्षण सिकाइ क्रियाकलाप सञ्चालन गर्दा विद्यार्थी केन्द्रित र बालमैत्री शिक्षण विधि अपनाउनुपर्ने छ । विद्यार्थीको सहभागितामा योजना निर्माण, परियोजना कार्य, क्षेत्र भ्रमण, समस्या समाधान, खोजमूलक अध्ययन, प्रवर्तनमुखी शिक्षण पद्धतिलाई शिक्षण सिकाइका विधिका रूपमा कार्यान्वयन गर्नुपर्ने छ । विद्यार्थीको सिकाइलाई केन्द्रबिन्दु मानी शिक्षण सिकाइ क्रियाकलाप सञ्चालन गर्नुपर्ने छ । सबै प्रकारका सिकाइ आवश्यकता र चाहना भएका (अपाङ्ग, अशक्त, असहाय, कमजोर आदि) विद्यार्थीलाई समेट्ने गरी कक्षामा समावेशी शिक्षण प्रक्रिया अपनाउनुपर्ने छ । साधारण, गुरुकुल, गोन्पा (गुम्बा) तथा विहार र मदसा शिक्षाका पठन पाठनमा आवश्यकताअनुसार कम्प्युटर प्रविधिको पनि उपयोग गर्न सकिने छ । यसका लागि शिक्षकले सहजकर्ता, उत्प्रेरक, प्रवर्धक र खोजकर्ताका रूपमा भूमिका निर्वाह गर्नुपर्ने छ ।
२. विद्यार्थीको सिकाइलाई केन्द्रबिन्दु मानी सिकाइ सहजीकरण क्रियाकलाप सञ्चालन गर्नुपर्ने छ । विद्यार्थीको सहभागितामा योजना निर्माण, परियोजना तथा प्रयोगात्मक कार्य, क्षेत्र भ्रमण, समस्या समाधान, आविष्कारमुखी अध्ययन, प्रवर्तनमुखी शिक्षण पद्धतिलाई सिकाइ सहजीकरण विधिका रूपमा कार्यान्वयन गर्नुपर्ने छ ।
३. सिकाइ प्रक्रिया सैद्धान्तिक पक्षमा भन्दा बढी गरेर सिक्ने अवसर प्रदान गर्ने क्रियाकलापमा आधारित हुनुपर्ने छ ।
४. शिक्षकले सहजकर्ता, उत्प्रेरक, प्रवर्धक र खोजकर्ताका रूपमा भूमिका निर्वाह गर्नुपर्ने छ ।
५. पठनपाठनमा सूचना तथा सञ्चार प्रविधिलाई उपलब्ध साधन, स्रोत र आवश्यकताअनुसार उपयोग गर्नुपर्ने छ ।
६. सबै प्रकारका सिकाइ आवश्यकता र चाहना भएका (अपाङ्गता भएका, अशक्त, असहाय, कमजोर आदि) विद्यार्थीलाई समेट्ने गरी कक्षामा समावेशी सिकाइ सहजीकरण प्रक्रिया अपनाउनुपर्ने छ ।

९. विषय छनोट प्रक्रिया

१. साधारणतर्फ कक्षा ११ र १२ मा ऐच्छिक विषय छनोट गर्दा निर्धारित चार समूहमध्ये कुनै तीन समूहबाट एक एकओटा पर्ने गरी ऐच्छिक विषय छनोट गर्नुपर्ने छ । विद्यार्थीले अध्ययन गर्न चाहेमा ऐच्छिक विषय छनोट नगरेको समूहबाट एक थप ऐच्छिक विषय अध्ययन गर्न सक्ने छन् । विद्यार्थीको रुचि तथा भावी अध्ययनलाई समेत आधार मानी विद्यालयले थप ऐच्छिक विषयको पठनपाठनको व्यवस्था गर्नुपर्ने छ ।
२. कक्षा ११ र १२ दुवैमा भौतिक विज्ञान, रासायनिक विज्ञान र जीव विज्ञान तीनओटै विषय अध्ययन गर्ने विद्यार्थीहरूले चाहेमा थप ऐच्छिक विषयका रूपमा गणित विषय अध्ययन गर्न पाउने छन् ।
३. प्राविधिक तथा व्यावसायिक धार तथा परम्परागत धारतर्फ विषयको छनोटका आधार सम्बन्धित पाठ्यक्रम संरचना तथा ऐच्छिक विषयका सूचीमा समावेश गरिएअनुसार हुने छ ।
४. कक्षा ११ र १२ मा ऐच्छिक विषय छनोट गर्दा कक्षा ११ र १२ मा एकै विषय वा फरक फरक विषय पनि छनोट गर्न सकिने छ । तर कक्षा ११ र १२ मा फरक फरक विषय छनोट गर्दा पाठ्यक्रम विकास केन्द्रले तयार गरेको विषय छनोट मार्गदर्शनलाई आधार मान्नुपर्ने छ ।

१०. विद्यार्थी मूल्याङ्कन प्रक्रिया

विद्यालय तहमा विद्यार्थी उपलब्धि मूल्याङ्कनका लागि निर्माणात्मक मूल्याङ्कन प्रक्रिया अवलम्बन गरी सिकाइ सुधारका लागि निरन्तर पृष्ठपोषण प्रदान गरिनुका साथै निर्णयात्मक मूल्याङ्कन प्रक्रियालाई अवलम्बन गरी विद्यार्थीको सिकाइस्तर निर्धारण गर्नुपर्छ ।

(क) निर्माणात्मक मूल्याङ्कन : निर्माणात्मक मूल्याङ्कनको मुख्य उद्देश्य विद्यार्थीहरूको सिकाइ स्तरमा सुधार गर्नु हो । यसका लागि शिक्षकले विद्यार्थीको व्यक्तिगत सिकाइ उपलब्धिका आधारमा पटक पटक सिकाइ अवसर प्रदान गर्नुपर्ने छ । विद्यालय तहको निर्माणात्मक मूल्याङ्कनमा कक्षागत सिकाइ सहजीकरणको अभिन्न अङ्गका रूपमा गृहकार्य, कक्षाकार्य, प्रयोगात्मक तथा परियोजना कार्य, सामुदायिक कार्य, अतिरिक्त क्रियाकलाप, एकाइ परीक्षा, मासिक तथा त्रैमासिक परीक्षा जस्ता मूल्याङ्कनका साधनहरूको प्रयोग गर्न सकिने छ । यस्तो

मूल्याङ्कनमा विद्यार्थीको अभिलेख राखी सिकाइ अवस्था यकिन गरी सुधारात्मक तथा उपचारात्मक सिकाइबाट सुधार गर्ने पक्षमा जोड दिने छ । विशेष सिकाइ आवश्यकता भएका विद्यार्थीका लागि विषय शिक्षकले नै उपयुक्त प्रक्रिया अपनाई मूल्याङ्कन गर्नुपर्ने छ ।

निर्माणात्मक मूल्याङ्कनको नतिजालाई अभिलेखीकरण गरी विषयगत पाठ्यक्रममा तोकिएअनुसार निश्चित भार आन्तरिक मूल्याङ्कनका रूपमा निर्णयात्मक मूल्याङ्कनमा समावेश गरिने छ ।

(ख) निर्णयात्मक मूल्याङ्कन : माध्यमिक तहमा निम्नानुसार निर्णयात्मक मूल्याङ्कन गर्नुपर्ने छ :

(अ) निर्माणात्मक मूल्याङ्कनबाट प्राप्त नतिजाका आधारमा आन्तरिक मूल्याङ्कनको र अन्तिम/बाह्य परीक्षाको नतिजाका आधारमा तोकिएको भार समावेश गरी विद्यार्थीको निर्णयात्मक मूल्याङ्कन गरिने छ ।

(आ) आन्तरिक मूल्याङ्कनका रूपमा निर्माणात्मक मूल्याङ्कनबाट प्राप्त निम्नानुसार तोकिएअनुसारको भारको मूल्याङ्कन निर्णयात्मक मूल्याङ्कनमा समावेश गरिने छ । आन्तरिक मूल्याङ्कनका तरिकामा विषयगत विविधता हुन सक्ने भए पनि निम्नलिखित पक्षको मूल्याङ्कन सबै विषयमा समावेश हुने छ :

- **कक्षा सहभागिताको मूल्याङ्कन :** विद्यार्थीको नियमितता (उपस्थिति) र कक्षा क्रियाकलापमा सहभागिताको अभिलेखका आधारमा गरिएको मूल्याङ्कन ।
- **त्रैमासिक परीक्षाहरूका अङ्कका आधारमा प्राप्त अङ्क :** पहिलो त्रैमासिक अवधिभरमा पठनपाठन भएका विषयवस्तुबाट पहिलो परीक्षा सञ्चालन गरिने छ भने पहिलो र दोस्रो त्रैमासिक अवधिभरमा पठनपाठन भएका विषयवस्तुबाट दोस्रो त्रैमासिक परीक्षा सञ्चालन गरिने छ ।
- **प्रयोगात्मक तथा परियोजना कार्यको मूल्याङ्कन**
- **विषयगत पाठ्यक्रममा तोकिएअनुसारका अन्य आधारहरू**

(इ) कक्षा ११ र १२ मा विषयगत पाठ्यक्रममा तोकिएअनुसारको भारको बाह्य सार्वजनिक परीक्षा हुने छ । बाह्य परीक्षा सैद्धान्तिक वा सैद्धान्तिक र प्रयोगात्मक दुवै हुन सक्ने छ ।

(ई) प्रयोगात्मक, सैद्धान्तिक तथा अन्य पक्षको मूल्याङ्कनको भार, विधि तथा साधन सम्बन्धित विषयको पाठ्यक्रममा उल्लेख भएअनुसार हुनुपर्ने छ । सैद्धान्तिक पक्षको मूल्याङ्कनका लागि विशिष्टीकरण तालिका निर्माण गरिने छ ।

(उ) परीक्षामा विशेष सिकाइ आवश्यकता भएका विद्यार्थीहरूलाई केही खास खास विषयहरूमा अरू साधारण विद्यार्थीहरूलाई दिइने प्रश्नभन्दा अलग प्रश्न बनाई मूल्याङ्कन गर्नुपर्ने छ । विशेष आवश्यकता भएका विद्यार्थीका लागि परीक्षाको समय थप गर्न सकिने छ । विद्यार्थी मूल्याङ्कन गर्दा शिक्षकले अपाङ्गता भएका र विशेष सिकाइ आवश्यकता भएका विद्यार्थीहरूका लागि उपयुक्त हुने मूल्याङ्कन प्रक्रिया अपनाउनुपर्ने छ ।

द्रष्टव्य : विद्यार्थीको स्तर निर्धारण (Grading) को विधि तथा प्रक्रियाका लागि पाठ्यक्रम विकास केन्द्रले छुट्टै निर्देशिका तयार गर्नेछ ।

११. शिक्षाको माध्यम

माध्यमिक शिक्षा कक्षा ११ र १२ मा शिक्षणको माध्यम भाषा सामान्यतया नेपाली भाषा हुने छ । तर देहायको अवस्थामा विद्यालयमा शिक्षाको माध्यम देहायबमोजिम हुने छ :

- (क) भाषा विषय अध्ययन गराउँदा शिक्षाको माध्यम सोही भाषा हुने छ ।
- (ख) सामाजिक अध्ययन र मानवमूल्य शिक्षा वा चारित्रिक शिक्षालगायत नेपाली कला, संस्कृति र मौलिक पहिचानमूलक विषयवस्तुहरूबाहेक अन्य विषयहरूमा पठनपाठनका लागि माध्यम भाषा अङ्ग्रेजी पनि प्रयोग गर्न सकिने छ ।
- (ग) संस्कृत तथा परम्परागत धारतर्फका शास्त्रीय विषयहरूको पाठ्यसामग्री र पठनपाठनको माध्यम सम्बन्धित भाषा हुने छ । धार्मिक प्रकृतिका विषयहरूको पठनपाठन सम्बन्धित धार्मिक ग्रन्थ लेखिएको भाषामा नै गर्न सकिने छ ।

(घ) गैरनेपाली नागरिकले नेपालका विद्यालयमा अध्ययन गर्दा नेपाली विषयको सट्टा अन्य कुनै भाषाको विषय अध्ययन गर्न सक्ने व्यवस्था मिलाउन सकिने छ ।

१२. पाठ्यक्रम मूल्याङ्कन

पाठ्यक्रमको मूल्याङ्कनका आधार निम्नानुसार हुने छन् :

- (क) विद्यार्थीको उपलब्धि स्तर
- (ख) शिक्षकको कार्य सम्पादन स्तर
- (ग) पठन पाठनमा उपयोग गरिएको समय
- (घ) विद्यार्थीको वैयक्तिक तथा सामाजिक व्यवहार र प्रभाव
- (ङ) अभिभावक तथा समाजको सिकाइप्रतिको अपेक्षा र प्रतिक्रिया
- (च) सरोकारवालाको विद्यालयप्रतिको धारणा

उपर्युक्त पक्षमा समेतका आधारमा प्रत्येक पाँच वर्षमा पाठ्यक्रमको मूल्याङ्कन गरिने छ । यसो गर्दा व्यक्ति, परिवार र समाजमा परेको प्रभाव समेतलाई हेरिने छ ।

१३. पाठ्यक्रम कार्यान्वयन योजना

राष्ट्रिय पाठ्यक्रम प्रारूप, २०७६ का सिद्धान्त तथा मार्गदर्शनमा आधारित भई विकास गरिएका विद्यालय तहका पाठ्यक्रमहरू निम्नानुसार परीक्षण तथा कार्यान्वयन हुनेछन् :

पाठ्यक्रम परीक्षण तथा कार्यान्वयन योजना

कक्षा	शैक्षिक वर्ष २०७६	शैक्षिक वर्ष २०७७	शैक्षिक वर्ष २०७८	शैक्षिक वर्ष २०७९	शैक्षिक वर्ष २०८०
१	परीक्षण	कार्यान्वयन			
२		परीक्षण	कार्यान्वयन		
३		परीक्षण	कार्यान्वयन		
४			परीक्षण	कार्यान्वयन	
५				परीक्षण	कार्यान्वयन
६		परीक्षण	कार्यान्वयन		
७			परीक्षण	कार्यान्वयन	
८					कार्यान्वयन
९			परीक्षण	कार्यान्वयन	
१०					कार्यान्वयन
११		कार्यान्वयन			
१२			कार्यान्वयन		

खण्ड ख

माध्यमिक शिक्षा पाठ्यक्रम (कक्षा ११ र १२), २०७६ : अनिवार्य विषयका पाठ्यक्रम

यस खण्डमा अनिवार्य विषयका विषयगत पाठ्यक्रम समावेश गरिएको छ । प्रत्येक विषयगत पाठ्यक्रममा परिचय, तहगत सक्षमता, कक्षागत सिकाइ उपलब्धि, विषयवस्तुको क्षेत्र र क्रम, प्रयोगात्मक तथा परियोजना कार्यअन्तर्गतका सम्भाव्य क्रियाकलापका उदाहरण, क्षेत्र वा एकाइगत कार्यघण्टा, विद्यार्थी मूल्याङ्कन विधि तथा प्रक्रिया उल्लेख गरिएको छ । यसमा कक्षा ११ र १२ का अनिवार्य विषयहरूका पाठ्यक्रम समावेश गरिएको छ ।

Secondary Education Curriculum

2078

Mathematics

Grades: 11 and 12

Subject code: MTH. 401 (Grade 11)

MTH. 402 (Grade 12)

Credit hrs.: 5

Working hrs.: 160

1. Introduction

Mathematics is an indispensable in many fields. It is essential in the field of engineering, medicine, natural sciences, finance and other social sciences. The branch of mathematics concerned with application of mathematical knowledge to other fields and inspires new mathematical discoveries. The new discoveries in mathematics led to the development of entirely new mathematical disciplines. School mathematics is necessary as the backbone for higher study in different disciplines. Mathematics curriculum at secondary level is the extension of mathematics curriculum offered in lower grades (1 to 10) and is the foundation course for higher study.

This course of Mathematics is designed for grade 11 and 12 students who wish to choose as an alternative of Social Study and Life Skill education subject as per the curriculum structure prescribed by the National Curriculum Framework, 2076. This course will be delivered using both the conceptual and theoretical inputs through demonstration and presentation, discussion, and group works as well as practical and project works in the real world context.

This course includes different contents like; Algebra, Trigonometry, Analytic Geometry, Vectors, Statistics and Probability, Calculus and Computational Methods or Mechanics.

2. Level-wise Competencies

On completion of this course, students will have the following competencies:

1. use basic properties of elementary functions and their inverse including linear, quadratic, reciprocal, polynomial, rational, absolute value, exponential, logarithm, sine, cosine and tangent functions.
2. use principles of elementary logic to find the validity of statement and also acquire knowledge of matrix, sequence and series, and combinatory.
3. identify and derive equations for lines, circles, parabolas, ellipses, and hyperbolas.
4. solve the problems related to real and complex numbers.
5. articulate personal values of statistics and probability in everyday life.

6. use vectors and mechanics in day to day life.
7. apply derivatives to determine the nature of the function and determine the maxima and minima of a function in daily life context.
8. explain anti-derivatives as an inverse process of derivative and use them in various situations.
9. apply numerical methods to solve algebraic equation and calculate definite integrals and use simplex method to solve linear programming problems (LPP).
10. use relative motion, Newton's laws of motion in solving related problems.

3. Grade-wise Learning Outcomes

On completion of the course, the students will be able to:

S. N .	Content Domain/area	Learning Outcomes	
		Grade 11	Grade 12
1.	Algebra	1.1 acquaint with logical connectives and construct truth tables. 1.2 prove set identities. 1.3 define interval and absolute value of real numbers. 1.4 find domain and range of a function. 1.5 find inverse function and calculate composite function of given functions. 1.6 define odd and even functions, periodicity of a function, monotonicity of a function. 1.7 sketch graphs of Quadratic, Cubic and rational functions of the form $\frac{1}{ax + b}$ where $a \neq 0$, Trigonometric ($\text{asin}bx$ and $\text{acos}bx$), exponential (e^x), logarithmic function ($\ln x$) 1.8 define and classify sequence	1.1 solve the problems related to basic principle of counting. 1.2 solve the problems related to permutation and combinations. 1.3 state and prove binomial theorems for positive integral index. 1.4 state binomial theorem for any integer. 1.5 find the general term and binomial coefficient. 1.6 use binomial theorem in application to approximation. 1.7 define Euler's number. 1.8 Expand e^x , a^x and $\log(1+x)$ using binomial theorem. 1.9 express complex number in polar form. 1.10 state and prove De Moivre's theorem.

		<p>and series.</p> <p>1.9 solve the problems related to arithmetic, geometric and harmonic sequences and series.</p> <p>1.10 establish relation among A.M, G. M and H.M.</p> <p>1.11 find the sum of infinite geometric series.</p> <p>1.12 obtain transpose of matrix and verify its properties.</p> <p>1.13 calculate minors, cofactors, adjoint, determinant and inverse of a square matrix.</p> <p>1.14 solve the problems using properties of determinants.</p> <p>1.15 define polynomial function and polynomial equation.</p> <p>1.16 state and apply fundamental theorem of algebra.</p> <p>1.17 find roots of a quadratic equation and establish the relation between roots and coefficient.</p> <p>1.18 form a quadratic equation with given roots.</p> <p>1.19 define a complex number and solve the problems related to algebra of complex numbers.</p> <p>1.20 find conjugate and absolute (modulus) value of a complex numbers and verify their properties.</p> <p>1.21 find square root of a complex number.</p>	<p>1.11 find the roots of a complex number by De Moivre's theorem.</p> <p>1.12 solve the problems using properties of cube roots of unity.</p> <p>1.13 apply Euler's formula.</p> <p>1.14 find the sum of finite natural numbers, sum of squares of first n-natural numbers, sum of cubes of first n-natural numbers.</p> <p>1.15 find the sum of finite natural numbers, calculate sum of squares of first n-natural numbers, sum of cubes of first n-natural numbers by using mathematical induction.</p> <p>1.16 solve system of linear equations by Cramer's rule and matrix methods (row-equivalent and inverse) up to three variables.</p>
2.	Trigonometry	<p>2.1 define inverse trigonometric functions and establish the relations on inverse</p>	<p>2.1 solve the problems using properties of a triangle (sine law, cosine law, tangent</p>

		<p>trigonometric functions.</p> <p>2.2 find the general solution of trigonometric equations.</p>	<p>law, projection laws, half angle laws)</p> <p>2.2 solve the triangle (simple cases)</p>
3.	Analytic geometry	<p>3.1 find the length of perpendicular from a given point to a given line</p> <p>3.2 find the equation of bisectors of the angles between two straight lines</p> <p>3.3 write the condition of general equation of second degree in x and y to represent a pair of straight lines</p> <p>3.4 find angle between pair of lines and bisectors of the angles between pair of lines given by homogenous second degree equation in x and y</p> <p>3.5 find the distance between two points in space, and direction cosines and ratios of a line.</p>	<p>3.1 solve the problems related to condition of tangency of a line at a point to the circle.</p> <p>3.2 find the equations of tangent and normal to a circle at given point.</p> <p>3.3 find the standard equation of parabola.</p> <p>3.4 find the equations of tangent and normal to a parabola at given point.</p> <p>3.5 obtain standard equation of ellipse and hyperbola.</p>
4.	Vectors	<p>4.1 identify collinear and non-collinear vectors</p> <p>4.2 identify coplanar and non-coplanar vectors.</p> <p>4.3 write linear combination of vectors.</p> <p>4.4 identify linearly dependent and independent of vectors</p>	<p>4.1 find scalar product of two vectors, angle between two vectors and interpret scalar product geometrically.</p> <p>4.2 solve the problems using properties of scalar product</p> <p>4.3 apply properties of scalar product of vectors in trigonometry and geometry.</p> <p>4.4 define vector product of two vectors, and interpret vector product geometrically.</p> <p>4.5 solve the problems using properties of vector product.</p> <p>4.6 apply vector product in geometry and trigonometry.</p>

5.	Statistics and Probability	<p>5.1 calculate standard deviation, variance and coefficient of variation</p> <p>5.3 calculate coefficient of skewness by Karl Pearson method.</p> <p>5.4 define random experiment, sample space, event, equally likely cases, mutually exclusive events, exhaustive cases, favorable cases, independent and dependent events.</p> <p>5.5 find the probability using two basic laws of probability.</p>	<p>5.1 calculate correlation coefficient by Karl Pearson's method.</p> <p>5.2 calculate rank correlation coefficient by Spearman method.</p> <p>5.3 interpret correlation coefficient.</p> <p>5.4 obtain regression line of y on x and x on y.</p> <p>5.5 solve the simple problems of probability using combinations.</p> <p>5.6 solve the problems related to conditional probability.</p>
6.	Calculus	<p>6.1 define limits of a function.</p> <p>6.2 identify indeterminate forms.</p> <p>6.3 apply algebraic properties of limits.</p> <p>6.4 evaluate limits by using theorems on limits of algebraic, trigonometric, exponential and logarithmic functions.</p> <p>6.5 define and test continuity of a function.</p> <p>6.6 define and classify discontinuity.</p> <p>6.7 interpret derivatives geometrically.</p> <p>6.8 find the derivatives of a function by the first principle (algebraic, trigonometric, inverse trigonometric exponential and logarithmic functions).</p> <p>6.9 find the derivatives by using rules of differentiation (sum,</p>	<p>6.1 differentiate the hyperbolic function and inverse hyperbolic function</p> <p>6.2 evaluate the limits by L'hospital's rule (for $\frac{0}{0}, \frac{\infty}{\infty}$).</p> <p>6.3 find the tangent and normal by using derivatives.</p> <p>6.4 find the derivative as rate of measure</p> <p>6.5 find the anti-derivatives of standard integrals, integrals reducible to standard forms</p> <p>6.6 solve the differential equation of first order and first degree by separable variables, homogenous, linear and exact differential equation-</p>

		<p>difference, constant multiple, chain rule, product rule, quotient rule, power and general power rules).</p> <p>6.10 find the derivatives of parametric and implicit functions.</p> <p>6.11 calculate higher order derivatives.</p> <p>6.12 check the monotonicity of a function using derivative.</p> <p>6.13 find extreme values of a function.</p> <p>6.14 find the concavity of function by using derivative.</p> <p>6.15 define integration as reverse of differentiation.</p> <p>6.16 evaluate the integral using basic integrals.</p> <p>6.17 integrate by substitution and by parts method.</p> <p>6.18 evaluate the definite integral.</p> <p>6.19 find area between two curves.</p>	
7.	Computational methods	<p>7.1 solve algebraic equation and transcendental equation by bisection method, Newton-Raphson method and find approximate error by these methods</p> <p>7.2 integrate numerically by trapezoidal rule and Simpson's rule</p>	<p>7.1 solve the system of linear equations by Gauss Elimination method, Gauss Seidel Method (up to 3 variables)</p> <p>7.2 solve the linear programming problems (LPP) by simplex method</p>
	Or Mechanics	7.1 find resultant forces by	7.1 solve the forces/vectors related problems using

	<p>parallelogram of forces.</p> <p>7.2 solve the problems related to composition and resolution of forces.</p> <p>7.3 obtain resultant of coplanar forces/vectors acting on a point.</p> <p>7.4 solve the problems of motion of particle in a straight line, motion with uniform acceleration, motion under the gravity, motion in a smooth inclined plane.</p>	<p>triangle laws of forces and Lami's theorem.</p> <p>7.2 solve the problems related to Newton's laws of motion and projectile.</p>
--	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------

4. Scope and Sequence of Contents

S.N.	Content area	Grade 11		Grade 12	
		Contents	Working hrs (Th. + Pr.)		Working hrs (Th. + Pr.)
1	Algebra	<p>1.1 Logic and Set: Statements, logical connectives, truth tables, theorems based on set operations.</p> <p>1.2 Real numbers: Geometric representation of real numbers, interval, absolute value.</p> <p>1.3 Function: Domain and range of a function, Inverse function, composite function,</p>	44	<p>1.1 Permutation and combination: Basic principle of counting, Permutation of (a) set of objects all different (b) set of objects not all different (c) circular arrangement (d) repeated use of the same objects, Combination of things all different, Properties of combination</p> <p>1.2 Binomial Theorem: Binomial theorem for a positive integer, general term, Binomial coefficient, Binomial</p>	44

		<p>introduction of functions; algebraic (linear, quadratic & cubic), Transcendental (trigonometric, exponential, logarithmic)</p> <p>1.4 Curve sketching: Odd and even functions, periodicity of a function, symmetry (about origin, X- and Y-axis), monotonicity of a function, sketching the graphs of Quadratic, Cubic and rational functions of the form $\frac{1}{ax + b}$ where $a \neq 0$, Trigonometric (asinbx and acosbx), exponential (e^x), logarithmic function (lnx)</p> <p>1.5 Sequence and series: Arithmetic, geometric, harmonic sequences and series and their properties A.M, G.M, H.M and their relations, sum of infinite geometric series</p> <p>1.6 Matrices and determinants: Transpose of a</p>		<p>theorem for any index (without proof), application to approximation, Euler's number, Expansion of e^x, a^x and $\log(1+x)$ (without proof)</p> <p>1.3 Complex numbers: Polar form of complex numbers, De Moivre's theorem and its application in finding the roots of a complex number, properties of cube roots of unity. Euler's formula.</p> <p>1.4 Sequence and series: Sum of finite natural numbers, sum of squares of first n-natural numbers, Sum of cubes of first n-natural numbers, principle of mathematical induction and use it to find sum.</p> <p>1.5 Matrix based system of linear equation: Solution of a system of linear equations by Cramer's rule and matrix method (row-equivalent and inverse) up to three variables.</p>	
--	--	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

		<p>matrix and its properties, Minors and cofactors, Adjoint, Inverse matrix, Determinant, Properties of determinants (without proof)</p> <p>1.7 Quadratic equation: Nature and roots of a quadratic equation, Relation between roots and coefficient. Formation of a quadratic equation, Symmetric roots, one or both roots common.</p> <p>1.8 Complex number: Imaginary unit, algebra of complex numbers, geometric representation, absolute (Modulus) value and conjugate of a complex numbers and their properties, square root of a complex number.</p>			
2	Trigonometry	<p>2.1 Inverse circular functions.</p> <p>2.2 Trigonometric equations and general values</p>	12	<p>2.1 Properties of a triangle (Sine law, Cosine law, tangent law, Projection laws, Half angle laws)</p> <p>2.2 Solution of triangle (simple cases)</p>	12
3	Analytic Geometry	<p>3.1 Straight Line: Length of perpendicular from</p>	20	<p>3.1 Conic section: Condition of tangency of a line at a point to the circle,</p>	20

		<p>a given point to a given line, Bisectors of the angles between two straight lines.</p> <p>3.2 Pair of straight lines: General equation of second degree in x and y, condition for representing a pair of lines, Homogenous second-degree equation in x and y, angle between pair of lines, Bisectors of the angles between pair of lines</p> <p>3.3 Coordinates in space: Points in space, distance between two points, direction cosines and ratios of a line</p>		<p>Tangent and normal to a circle, Standard equation of parabola, equations of tangent and normal to a parabola at a given point, Standard equations of Ellipse and hyperbola.</p>	
4	Vectors	<p>4.1 Vectors: Collinear and non collinear vectors, coplanar and non-coplanar vectors, linear combination of vectors, Linearly dependent and independent</p>	12	<p>4.1 Product of Vectors: Scalar product of two vectors, angle between two vectors, geometric interpretation of scalar product, properties of scalar product, application of scalar product in geometry and trigonometry, vector product of two vectors, geometrical interpretation of vector product, properties of vector product, application of vector product in geometry and</p>	12

				trigonometry.	
5	Statistics and Probability	<p>5.1 Measure of Dispersion: Standard deviation, variance, coefficient of variation, Skewness, Karl Pearson's coefficient of skewness</p> <p>5.2 Probability: Independent cases, mathematical and empirical definition of probability, two basic laws of probability (without proof).</p>	12	<p>5.1 Correlation and Regression: Correlation, nature of correlation, correlation coefficient by Karl Pearson's method, interpretation of correlation coefficient, properties of correlation coefficient (without proof), rank correlation (only elementary concept), regression equation, regression line of y on x and x on y.</p> <p>5.2 Probability: Dependent cases, conditional probability (without proof).</p>	12
6	Calculus	<p>6.1 Limits and continuity: Limits of a function, indeterminate forms. algebraic properties of limits (without proof), Basic theorems on limits of algebraic, trigonometric, exponential and logarithmic functions, continuity of a function, types of discontinuity, graphs of discontinuous function.</p> <p>6.2 Derivatives: Derivative of a</p>	48	<p>6.1 Derivatives: Rules for differentiating hyperbolic function and inverse hyperbolic function, L'Hospital's rule ($\frac{0}{0}, \frac{\infty}{\infty}$), differentials, tangent and normal, derivative as rate of measure.</p> <p>6.2 Anti-derivatives: Anti-derivatives of standard integrals, integrals reducible to standard forms, integrals of rational function.</p> <p>6.3 Differential equations: Differential equation and its order, degree, differential equations of first order and first</p>	48

		<p>function, derivatives of algebraic, trigonometric, inverse of trigonometric, exponential and logarithmic functions by definition (simple forms), rules of differentiation. derivatives of parametric and implicit functions, higher order derivatives, geometric interpretation of derivative, monotonicity of a function, interval of monotonicity, extreme values of a function, concavity, points of inflection.</p> <p>6.3 Anti-derivatives: Integration using basic integrals, integration by substitution and by parts methods, the definite integral, the definite integral as an area under the given curve, area between two curves.</p>		<p>degree, differential equations with separable variables, homogenous, linear and exact differential equations.</p>	
7	Computational Methods	<p>7.1 Numerical computation: Roots of algebraic and transcendental</p>	12	<p>7.1 System of linear equations: Gauss Elimination Method, Gauss Seidel Method</p>	12

	Or Mechanics	<p>equation (bisection and Newton-Raphson method)</p> <p>7.2 Numerical integration: Trapezoidal rule and Simpson's rule</p>		<p>7.2 Linear programming problems (LPP): simplex method (two variables only)</p>	
		<p>7.1 Statics: Forces and resultant forces, parallelogram law of forces, composition and resolution of forces, Resultant of coplanar forces acting on a point.</p> <p>7.2 Dynamics: Motion of particle in a straight line, Motion with uniform acceleration, motion under the gravity, motion down a smooth inclined plane.</p>		<p>7.1 Statics: Triangle law of forces and Lami's theorem.</p> <p>7.2 Dynamics: Newton's laws of motion and projectile.</p>	
Total			160		160

**School must allocate separate classes for practical and project activities for students.*

5. Sample project works/practical works

Sample project works/practical works for grade 11

1. Take a square of arbitrary measure assuming its area is one square unit. Divide it in to four equal parts and shade one of them. Again take one not shaded part of that square and shade one fourth of it. Repeat the same process continuously and find the area of the shaded region.
2. Truth values of conjunction and disjunction using logic gate circuits
3. Write two simple statements related to mathematics and write four compound statements by using them.
4. Prepare a model to illustrate the values of sine function and cosine function for different angles which are multiples of $\frac{\pi}{2}$ and π .
5. Prepare a model to explore the principal value of the function $\sin^{-1}x$ using a unit circle and present in the classroom.
6. Draw the graph of $\cos^{-1}x$, using the graph of $\cos x$ and demonstrate the concept of mirror reflection (about the line $y = x$).
7. Derive the length of perpendicular from (h, k) to line $ax+by+c=0$
8. Derive the condition that general equation of second degree x and y represent pair of line.
9. Verify that the equation of a line passing through the point of intersection of two lines $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ is of the form $(a_1x + b_1y + c_1) + K(a_2x + b_2y + c_2) = 0$.
10. Prepare a model and verify that angle in a semi-circle is a right angle by using vector method.
11. Collect the scores of grade 10 students in mathematics and English from your school.
 - a. Make separate frequency distribution with class size 10.
 - b. Which subject has more uniform/consistent result?
 - c. Make the group report and present.
12. Roll two dices simultaneously 20 times and list all outcomes. Write the events that the sum of numbers on the top of both dice is (a) even (b) odd in all above list. Examine either they are mutually exclusive or not. Also find the probabilities of both events.
13. Search the application of derivative in our daily life with example.
14. Find the area of circular region around your school using integration.
15. Take a metallic bar available at your surrounding and make a rectangular frame. Find the dimension of the rectangular metallic frame with maximum area.

16. Find the roots of any polynomial equation by using any ICT tools and present it in the classroom.
17. Correlate the trapezoidal rule and Simpson rule of numerical integration with suitable example.
18. Find the daily life problem related to motion of a particle in a straight line and solve that problem.

Sample project works/practical works for grade 12

1. Represent the binomial theorem of power 1, 2, and 3 separately by using concrete materials and generalize it with n dimension relating with Pascal's triangle.
2. Verify the sine law by taking particular triangle in four quadrants.
3. Verifications of
 - a) Cosine law
 - b) Projection law
4. Construction of ellipse by using a piece of pencil, rope and nails
5. Prepare a concrete material to show parabola by using thread and nail in wooden panel.
6. Construct an ellipse using a rectangle.
7. Express the area of triangle and parallelogram in terms of vector.
8. Collect the grades obtained by 10 students of grade 11 in their final examination of English and Mathematics. Find the correlation coefficient between the grades of two subjects and analyze the result.
9. Find two regression equations by taking two set of data from your textbook. Find the point where the two regression equations intersect. Analyze the result and prepare a report.
10. Find, how many peoples will be there after 5 years in your districts by using the concept of differentiation.
11. Verify that the integration is the reverse process of differentiation with examples and curves.
12. Identify different applications of Newton's law of motion and related cases in our daily life.
13. Investigate a daily life problem on projectile motion. Solve that problem and present in the classroom.
14. Write any one real life problem related to linear programming problem and solve that problem by using simplex method.

6. Learning Facilitation Method and Process

Teacher has to emphasis on the active learning process and on the creative solution of the exercise included in the textbook rather than teacher centered method while teaching mathematics. Students need to be encouraged to use the skills and knowledge related to mathematics in their house, neighborhood, school and daily activities. Teacher has to analyze and diagnose the weakness of the students and create appropriate learning environment to solve mathematical problems in the process of teaching learning.

The emphasis should be given to use diverse methods and techniques for learning facilitation. However, the focus should be given to those method and techniques that promote students' active participation in the learning process. The following are some of the teaching methods that can be used to develop mathematical competencies of the students:

- Inductive and deductive method
- Problem solving method
- Case study
- Project work method
- Question answer and discussion method
- Discovery method/ use of ICT
- Co-operative learning

7. Student Assessment

Evaluation is an integral part of learning process. Both formative and summative evaluation system will be used to evaluate the learning of the students. Students should be evaluated to assess the learning achievements of the students. There are two basic purposes of evaluating students in Mathematics: first, to provide regular feedback to the students and bringing improvement in student learning-the formative purpose; and second, to identify student's learning levels for decision making.

a. Internal evaluation

Internal assessment includes classroom participation, terminal examinations, and project work/practical work (computer works and lab work) and presentation. The scores of evaluation will be used for providing feedback and to improve their learning. Individual and group works are assigned as projects.

The basis of internal assessment is as follows:

Classroom participation	Marks from terminal examinations	project work/practical work	Total
3	6	16	25

(i) Classroom participation

Marks for classroom participation is 3 which is given on the basis of attendance and participation of students in classroom activities in each grade.

(ii) Marks from trimester examinations

At least two trimester examination should be conducted in each grade. Marks obtained by the students in trimester examinations will be converted into 6 full marks.

(iii) Project work/practical work

A mark for project work/practical work is 16. Criteria for marking practical works/project works

S. N.	Criteria	Marks
1.	Practical works/Project works	10
2.	Presentation and record keeping	6
		16

b. Final/External Examination

Final/external evaluation of the students will be based on the written examination at the end of each grade. It carries 75 percent of the total weightage. The types and number questions will be as per the test specification chart developed by the Curriculum Development Centre.

Applied Mathematics

Grade: 11 and 12

Subject Code: Ama. 403 (Grade 11) and 404 (Grade 12)

Credit hour: 5

Working hours: 160

1. Introduction

The world today faces limitless problems that need to be solved using ingenious and everyday innovations. Creativity and the ability to solve a plethora of problems are extremely valuable traits for windfall of development in the near future. It is reflected that learners seem busy in spending a lot of time memorizing specific formulae and specific questions for the purpose of examinations. It detrimentally impacts students' ability to solve problems in a creative way. Thus, there is a need of having a mathematics curriculum that helps reduce such trends. To provide a platform where learners can come up with innovative, practical and creative solutions, applied mathematics is a must. This curriculum on Applied Mathematics is designed to fulfill the need of learners who aspire to harness the power of mathematics in their everyday lives.

The curriculum of Applied Mathematics in Grade 11 and 12 solves two rather interrelated problems: firstly, being the need to instill fluidity when it comes to learning; and secondly, the tendency of students to rote learning different parts of mathematics. This can be effectively done using an applied mathematics. In doing so, Applied Mathematics promotes facilitation approaches such as project-based learning, discovery method, inquiry-based learning, inductive and deductive method, activity-based approaches and problem-solving approaches.

The curriculum prepared in accordance with National Curriculum Framework is structured for two academic years in such a way that it incorporates the level-wise competencies, grade-wise leaning outcomes, scope and sequence of contents, suggested experimental and project works, learning facilitation method and process and student assessment strategies so as to enhance the learning on the subject systematically.

2. Level wise Competencies

By the end of grade 12, the students will have the following competencies:

1. Collect various raw data from their surrounding based on a certain situation and classify, organize and represent the collected data in an appropriate way.
2. Summarize, interpret and analyze the collected data through appropriate descriptive statistical measurements.
3. Use various local, national and international units of measurement with their conversions and comparisons in their daily life.
4. Estimate, compare and measure the length, weight, volume, perimeter and area, temperature of objects around their surroundings.
5. Solve the problems related to direct and indirect exchange of money including its inflation.
6. Get an idea of dealing with growth/decline of investments and loans on the basis of different time boundaries limited to those that deal with personal, household, business finance, national and global finance, and complex financial scenarios.
7. Calculate premiums according to the existing insurance policies.

8. Calculate various vat and taxation policies as well as different tariff system.
9. Prepare a plan of short-term budgeting (personal, family, institutional, business, government bodies) including unexpected expenses.
10. Convert different daily life related problems into mathematical form and draw the conclusion to decide the best values of the related variable that minimize cost and maximize gain (two variables only).
11. Make an appropriate decision to select the best alternatives in different conditions (certainty, uncertainty and risk)
12. Solve the problems related to arrangement and selection of objects in different conditions.
13. Make an appropriate prediction and calculation of probability in different situations.
14. Translate various real-world problems into linear model form and use it to solve the problems.

3. Grade-wise Learning Outcomes

Grade 11

Unit	Content Area	Learning Outcomes
1	Data Handling	<ol style="list-style-type: none"> 1. Collect data and select a suitable way of presenting raw data. 2. Construct and interpret different (e.g., stem-and-leaf diagrams, box-and-whisker plots, histograms and cumulative frequency) representational graphs. 3. Exemplify and use different measures of central tendency in appropriate contexts (mean, median, mode). 4. Define, calculate and explain the use of measures of dispersion (range, inter-quartile range, quartile deviation, mean deviation and standard deviation).
2	Measurement	<ol style="list-style-type: none"> 1. Convert units of measurement using given conversion factors (related with area, volume, weight, temperature etc.) (familiar contexts). 2. Use the values and quantities in units appropriate to the context. (For example, expressing the length of a room in meters rather than in mm, cm or the distance between two cities in kilometers rather than in mm, cm or m) (familiar contexts). 3. Determine length using appropriate measuring instruments (familiar contexts). 4. Estimate lengths and measure lengths of objects accurately to complete tasks (familiar contexts). 5. Estimate distances and measure distances accurately between objects/positions in space using appropriate maps and scales (familiar contexts). 6. Determine mass (weight) using appropriate measuring instruments and convert the units of weight (familiar contexts).

		7. Estimate and calculate the perimeter and area of the regular and irregular shapes with the associated cost (for example to color, to fence, etc.) (familiar contexts).
3	Consumer mathematics	<ol style="list-style-type: none"> 1. Solve the problem related to money exchange with rates (national to global and global to national). 2. Calculate the amount of loan and investment based on various time basis and interest rates related to personal, household and business finance (local and province). 3. Find the value and role risk in economics through different forms of insurances related to personal, household and business finance (local and province). 4. Introduce about taxation and tax policies and its computation (local and province). 5. Explain the role and value of goodwill in business and other organizations related to personal, household and business finance (local and province). 6. Explain different tariff systems according to different levels of government (local and province).
4	Selecting the Best Value/Alternative	<ol style="list-style-type: none"> 1. Translate different word problems/situations (daily life and business) into mathematical form in local and familiar contexts only including two variables. 2. Identify the optimized values of the related variables (for example: profit maximization and loss minimization) through different ways of optimization in local and familiar contexts. 3. Extract the best alternative from a list of related alternatives and make an appropriate decision in various finance related situations (local and familiar contexts).
5	Selection and Arrangements	<ol style="list-style-type: none"> 1. Illustrate permutation (arrangements) and arrange the objects in different ways (local and familiar contexts for example: paint and shirt arrangement, socks and shoes arrangements, arrangements of students in a bench, arrangements of family members in a round dining table, etc.). 2. Select the desired committee from the given population in various ways (local and familiar contexts; examples will be limited to the surrounding of the students).
6	Probability and Prediction	<ol style="list-style-type: none"> 1. Solve the problems related to simple probabilities based on daily practices and business-related situations including games. (single variable). 2. Predict on the basis of probability (single variable).
7	Linear Modeling	<ol style="list-style-type: none"> 1. Use linear models to represent, solve and predict the real-world problems.

Grade 12

Unit	Content Area	Learning Outcomes
1	Data Handling	<ol style="list-style-type: none"> 1. Calculate the measures of central tendency and the measures of dispersion by using spreadsheet. 2. Estimate the directional extent to which the distribution is away from the symmetrical distribution. 3. Determine the skewness of given data. 4. Compute correlation and explain the use of correlation in various fields. 5. Compute the regression for estimating the values of the unknown variables based on the values of some known variables.
2	Measurement	<ol style="list-style-type: none"> 1. Use the values and quantities with units appropriate to the context. (For example, expressing the length of a room in meters rather than in mm, cm or the distance between two cities in kilometers rather than in mm, cm or m) (familiar and unfamiliar contexts). 2. Estimate and determine length using appropriate measuring instruments (familiar and unfamiliar contexts). 3. Estimate distances and measure distances accurately between objects/positions in space using appropriate maps and scales (familiar and unfamiliar contexts). 4. Estimate and calculate the area of the regular and irregular shapes with the associated cost (familiar and unfamiliar contexts).
3	Consumer mathematics	<ol style="list-style-type: none"> 1. Calculate the amount of loan and investment based on various time basis and interest rates related to personal, household, workplace, business, national and global finance, and more complex financial scenarios. 2. Find the value and role risk in economics through different forms of insurances related to national and global finance, and more complex financial scenarios. 3. Introduce taxation and tax (VAT) policies and its computation (national and global). 4. Calculate dividend in stock exchange. 5. Solve problems related to ratios and proportions. 6. Explain the role and value of goodwill in business and other organizations related to business finance (national and global). 7. Explain about the different tariff systems (national and global).
4	Selecting the Best Value/Alternative	<ol style="list-style-type: none"> 1. Express the different word problems/situations (daily life and business) into mathematical form including two variables. 2. Identify the optimized values of the related variables (for example:

		profit maximization and loss minimization) using graphical method. 3. Extract the best alternative from a list of related alternatives and make an appropriate decision in various finance related situations (some larger context like: institutional).
5	Selection and Arrangements	1. Arrange the objects in different ways (some larger contexts, like: arrangements of buses in different routes, arrangements of books in a library, some objects always be together, etc.), 2. Select the desired committee from the given population in various ways (some larger contexts: like organizational).
6	Probability and Prediction	1. Solve the problems related to conditional probabilities based on daily practices and business-related situations including games (more than one variable). 2. Predict on the basis of probability (more than one variable).
7	Linear Modeling	1. Represent the linear models, solve and predict the real world problems. 2. Use projects related to linear modeling to solve the real-world problems.

4. Scope and Sequence of Contents

Grade 11

Unit	Content Area	Unit	Contents	Working hours (Th.)
1	Data Handling	Representing data	<ul style="list-style-type: none"> Drawing and interpreting bar graphs, double bar graphs, histograms, pie charts, broken-line graphs, scatter plots. 	23
		Analyzing data	<ul style="list-style-type: none"> Organizing and summarizing data: using tallies, tables and stem-and-leaf displays Determining and analyzing measures of central tendency and partition values (mean, median, mode, quartiles, deciles and percentile) Determining and analyzing measures of dispersion Interpreting the data and generating meaning from it. 	

2	Measurement	Measuring Length	<ul style="list-style-type: none"> • Concept of point and interval estimation with examples • Estimating and measuring the length and height of room, school building, land, road, etc. in appropriate measurement unit • Conversion related to the units of length 	19
		Measuring Volume	<ul style="list-style-type: none"> • Estimation and measurement of the volume of regular objects (like: cube and cuboids, conic shaped, etc.) • Number of different sized small 3D objects contained in a large container. 	
		Perimeter and area	<ul style="list-style-type: none"> • Estimation and measurement of the perimeter and area of regular objects (piece of paper, top surface of book, desk, whiteboard, etc.), circular shapes (round shaped), composite shapes (area of window and door with half circle, etc.) and 3-D objects (total surface area of wall, carton, etc.) in appropriate unit and conversion of the units of area. • Perimeter and area of irregular 2-D and 3-D shapes 	
		Weight	<ul style="list-style-type: none"> • Weight of different objects and conversion of the units of weight (pound, oz, tola, dharni, bisauli, ton, quintal, kilogram, gram etc.) 	26
		Temperature	<ul style="list-style-type: none"> • Conversion of the units of temperature • Temperature measuring skill 	
3	Consumer mathematics	Money and Exchange	<ul style="list-style-type: none"> • Direct and indirect exchange 	26
		Loan and Investment	<ul style="list-style-type: none"> • Growth/decline of investments and loans on the basis of different time boundaries limited to those that deal with personal, household, and 	

			business finance	
		Insurance policy	<ul style="list-style-type: none"> Insurance policy related to life and health 	
		Taxation and VAT	<ul style="list-style-type: none"> Taxation related to personal, household related items 	
		Ratio and Proportion	<ul style="list-style-type: none"> Continued ratio and direct proportion (including time and work-related problems) 	
		Inflation	<ul style="list-style-type: none"> Types of inflation in the context of Nepali economy 	
		Tariff Systems	<ul style="list-style-type: none"> Municipal tariffs (for example, electricity; water; sewage), telephone tariffs (for example, cell-phone and fixed line), water tariffs, etc. 	
		Partnership	<ul style="list-style-type: none"> Simple partnership including goodwill and their mathematical calculation 	
		Budgeting	<ul style="list-style-type: none"> Introduction of budgeting, purpose of budgeting, principle of budgeting, types of budgeting, steps involved in budgeting and use of mathematical tools in budget preparation 	
4	Selecting the Best Value/ Alternative	Linear programming	<ul style="list-style-type: none"> Draw the conclusion to decide the best values of the related variable that minimize cost and maximize gain through graphical method (two variables only). 	19
		Decision making	<ul style="list-style-type: none"> All possible alternatives while making decision regarding their daily, family, business problems Introduction and use of related terms commonly used in decision theory (like; decision alternatives, state of nature, pay off (profit under the given criteria), pay off table, certainty, uncertainty, risk, etc.) Preparation of payoff table 	

			<p>corresponding to the required situation using the decision alternatives</p> <ul style="list-style-type: none"> • Make decision under the condition of certainty. 	
5	Selection and Arrangements	Selection	<ul style="list-style-type: none"> • Selection of objects from the given set of objects/ committee formation related problems 	11
		Arrangements	<ul style="list-style-type: none"> • Arrangements of n objects taken r at a time in different conditions (not repeated) 	
6	Probability and Prediction	Probability and Prediction	<ul style="list-style-type: none"> • Calculating probability in situation involving coins and dice (single variable) • Predictions (weather, etc.) 	11
7	Linear Modeling	Linear Modeling	<ul style="list-style-type: none"> • Modeling a linear equation to solve an unknown number • Setting up a linear equation to solve a real-world application • Making a prediction with the help of linear model 	11
Total				120

Grade 12

Unit	Content Area	Unit	Contents	Working hours (Th.)
1	Data Handling	Representing data	<ul style="list-style-type: none"> • Representing data into multiple bar graphs and subdivided bar graphs, box plot, cumulative frequency distribution, ogive • Use of spreadsheet to generate graphs and charts 	23
		Analyzing data	<ul style="list-style-type: none"> • Relation between two variables (using scatter plot, Karl-Pearson and rank) • Estimating the value of one dependent variable based on some values of independent variable • Use of spreadsheet to calculate central tendency and dispersion, best-fit and 	

			<p>regression line (including forecasting/pre-casting).</p> <ul style="list-style-type: none"> Measuring skewness of the data 	
2	Measurement	Measuring Length	<ul style="list-style-type: none"> Estimating and measuring the length of curved road, length of wire needed to connect cable line/ internet from the pole to the room, length of wire needed to round the kitchen garden etc. 	23
		Measuring Volume	<ul style="list-style-type: none"> Volume of frustum shaped objects Relationship regarding the volume of different familiar objects like (cone and cylinder, change in the radius of the base of cylinder, etc.) Volume estimation and measurement of irregular objects 	
		Area	<ul style="list-style-type: none"> Area of crossroad (+ formed and \times formed), irregular objects (piece of teared paper, cloth, irregular land, etc.), total surface area of different type of pyramid shaped objects (triangle based, square based, circle based, etc.) 	
3	Consumer mathematics	Loan and Investment	<ul style="list-style-type: none"> Comparison of growth/decline of investments and loans on the basis of different time boundaries limited to those that deal with personal, household, workplace, business, national and global finance, and more complex financial scenarios 	30
		Insurance policy	<ul style="list-style-type: none"> Insurance policy related to asset 	
		Taxation and VAT	<ul style="list-style-type: none"> Taxation and related to workplace, business, national and global finance 	
		Stock market and dividend	<ul style="list-style-type: none"> Introduction to stock market Calculation of dividend in stock exchange 	

		Ratio and Proportion	<ul style="list-style-type: none"> Compound proportion, indirect proportion 	
		Inflation	<ul style="list-style-type: none"> Analysis of inflation rates in different time context 	
		Partnership	<ul style="list-style-type: none"> Compound partnership including goodwill 	
		Budgeting	<ul style="list-style-type: none"> Reviews of various components of budgeting 	
4	Selecting the Best Value/ Alternative	Linear programming	<ul style="list-style-type: none"> Convert different daily life related word problems into mathematical form, draw the conclusion to decide the best values of the related variable that minimize cost and maximize gain through graphical method (two variables only). 	11
		Decision making	<ul style="list-style-type: none"> Review basic decision-making process Make decision under the condition of uncertainty (through Maxi-max, Maxi-min, Mini-max criterion) Make decision under the condition of risk. 	
5	Selection and Arrangements	Selection	<ul style="list-style-type: none"> Selection of objects from the given set of objects/committee formation related problems. 	11
		Arrangements	<ul style="list-style-type: none"> Arrangements of n objects taken r at a time in different conditions (repeated, not repeated, circular) Including the repeated objects. 	
6	Probability and Prediction		<ul style="list-style-type: none"> Calculating probability in situation involving coins and dice (more than one variable) Conditional probabilities 	11
7	Linear Modeling	Linear Modeling	<ul style="list-style-type: none"> Linear models to represent, solve and predict the real-word problems 	11
Total				120

5. Suggested Experimental and Project Works

Practical is integral part of Secondary Education Curriculum. It focuses more on skill development than knowledge building. It consists of experimental and project works. Total 40 hours has been designated to experimental and project work activities and will be carried out under the guidance and monitoring of teacher. Following are only suggested activities, teacher can assign any relevant practical activity as per requirement.

Grade 11

S.N.	Unit	Experimental and Project works	Working hours (Pr.)
1.	Data Handling	Problems related to the personal lives of students with one and two sets of data and comparisons. e.g. Keep record of your study ten minutes every day for a week. Calculate mean, median and standard deviation and interpret the results.	7
2.	Measurement	Problems related to the household and school and/or wider community, and local contexts. e.g. Measure the length and breadth of the given plot of the land and find the area. And find the total cost of the land on the basis of given unit cost.	6
3.	Consumer Mathematics	Problems related to short term budgeting (personal, family) including unexpected expenses. e.g. Develop the budget sheet of your family and interpret its implications.	9
4.	Selecting the best value/alternative	Problems related to optimization and decision making. e.g. Given the following constraints, $x + y \leq 5$ and $x - y \leq 1$. Optimize $Z = 2x + 3y$ by graphical method.	6
5.	Selection and Arrangements	Problems related to arrangements. e.g. Make possible committees of 5 members out of 7 persons without repeating the members.	4
6.	Probability and prediction	Problems related to probability and prediction. e.g. Determine experimental probability of 1, 2, 3, 4, 5 or 6 by throwing a dice 50 times and compare them with their theoretical probabilities.	4
7.	Linear modeling	Problems related to making a prediction with the help of linear modeling. e.g. make prediction table of $2x + 3y = 13$ in which the prediction values should be positive.	4
Total			40

Grade 12

S.N.	Unit	Experimental and Project works	Working hours (Pr.)
1.	Data Handling	Projects in the contexts related to the personal lives of learners, wider social issues and national and/or global issues with multiple sets of data and comparisons. e.g. Represent five years' SEE/SLC results of your school in multiple bar graphs and interpret the results.	7
2.	Measurement	Projects in familiar and unfamiliar contexts (Including irregular shapes such as land) E.g.: By consulting with a contractor, calculate the cost of construction of 2.5 storeyed house according to given unit costs.	7
3.	Consumer Mathematics	Problems related to long term budgeting (personal, family) and short term budgeting (institutional, business, government bodies) including unexpected expenses. e.g. Develop a one year budget sheet of your school and present in the class.	10
4.	Selecting the best value/alternative	Problems related to optimization and decision making. e.g. A bakery company produces doughnuts and cakes. Each doughnut takes four minutes for cooking and two minutes for packing. Each cake requires three minutes for cooking and one minute for packing. Now, 240 minutes is available for and 100 minutes is available for packing. Each doughnut produced gives a profit of Rs 7 and each cake Rs 5. How many doughnuts and cakes should be made for maximum profit? Formulate the problem mathematically and solve by graphical method.	4
5.	Selection and Arrangements	Problems related to arrangements. e.g. Make a group of 3 persons from the group of 10 persons with repetition.	4
6.	Probability and prediction	Problems related to probability and prediction. e.g. Determine the probability of head in coin and 2 in a dice by throwing a coin and a dice 50 times together.	4
7.	Linear Modeling	Problems related to making a prediction with the help of linear modeling. e.g. Measure the height and weight of 20 students of your school and convert them into a linear relation. Use the relation to predict height or weight while one is given.	4
Total			40

6. Learning Facilitation Method and Process

The effective and innovative facilitation methods are abundantly helpful in presenting the learning contents and reaching the outcomes. According to the nature of this course, innovative, constructivist, and progressive pedagogical facilitation methods will be the backbone to help students construct the meanings. In this context, this course allows teachers and students to adopt the following approaches in teaching and learning of this course.

- **Activity-based instruction:** Among the various methodologies of facilitation, this method is about connecting the concepts of the Applied Mathematics to the real-world activities. The activities are essential communicator through the advanced learning materials which spike the higher cognitive level of learner as well as these are immensely important to connect human affective domain with the concept of mathematics.
- **Project-based learning:** The project-based learning approaches are effective in terms of understanding concepts through real-world applied project works. These are considered to be the best approach for developing 21st century skills in students, developing deeper knowledge by exploring the real-world problems and challenges. This can be very much useful in the Applied Mathematics for the holistic understanding of concepts.
- **Discovery learning:** As in project-based approaches, this method is about developing learners' higher cognitive level thereby connecting the affective and psychomotor domain. Learners get new challenges every day that they should be come up with the creative solutions, creative products or discoveries. In so doing, they are able to develop several practical skills. For this, facilitators provide students the innovative real-world challenges through which students are able to involve in new discoveries.
- **Inquiry based learning:** It is said that we discover new things when there is inquiry process amid the people as human being have an immense potential of being curious and education should foster this ability through inquiry-based approaches. In this course, the inquiry process can happen among students, students-teachers, and students-community. The continuous process of asking questions and researching their answers should be fostered in this course.
- **Induction and deduction:** These two are the methods in which learners are able to develop their potential logical-mathematical ability. In this course, induction method is a discovery approach in which students find the rules by observing the real-world examples. Deduction method is about formulating examples and activities through generalized rules. In so doing, this course provides an ample opportunity for learners to develop their logical ability to come up with divergent solutions.
- **Problem solving:** Unlike conventional rote problem-solving methods, this course has a space to apply real-world problem-solving methods in learning and exploring the concepts. For this, facilitators should provide the learners the abundance real-world challenges so that they can come up with practical solutions. The contents presented in this course are more of relevant to solving the day to day problems.
- **Technology-based learning:** In this era of rapid development in science and technology, innovative technological tools are the essential things for us to present contents in a holistic manner. These technological tools work as mediums to demonstrate concepts through audio-visual perspective. Learners get involved in simulations, demonstrations and presentations with the help of technological tools inside out. In a nutshell, the facilitators are welcomed to use and create the various technology-based tools and techniques.

7. Student Assessment

Apart from regular classroom teaching learning activities, the curriculum of Applied Mathematics is developed with the conviction that learners' active participation is a must for attaining its curricular learning outcomes. With this view in mind, the notion of learning has been conceived through activity-based instruction in which learners participate in clearly defined activities and tasks. Performance of such tasks and activities are linked with their school-based evaluation (see specification grid). Thus, as far as assessment in Applied Mathematics is concerned, two assessment forms - internal (25%) and external (75%) assessments are provisioned.

a. Internal Assessment

In case of internal assessment, a portfolio-based assessment is suggested for the use in both the grades. The following specific learning tasks and activities are suggested for each grade.

A group project work of 5 marks, individual projects of 10 marks, a viva of 5 marks, a presentation of 3 marks and 2 marks for participation in which, the students in consultation with subject teachers will have freedom to do the tasks covering at least one project/experimental task from each learning area.

Task	Marks	Number of tasks	Total marks
Group projects/experimental tasks	3	1	3
Individual projects/experimental tasks	3	2	6
Viva	3	1	3
Presentation	4	1	4
Classroom participation	3	-	3
Score from trimester examination	3	2	6
Total			25

The practical task given to the students is expected to have the following qualities:

- Investigative Tasks:** The main purpose of the investigative task is to promote learners of applied mathematics to work on tasks that demand deepen investigation. In this process, students use a range of mathematical skills from the given topics to investigate a problem set in a context. For example, students might be asked to find relations between different variables; explore different ways to arrange objects; and compare different sets of information before making best possible decision. Although, it depends upon the contexts, at least four investigative tasks shall be done in each grade.
- Survey Items:** One of the key steps in applying analytical skills is to develop survey questionnaires and collect the required information. Students' knowledge and skills in tabulating information, presenting them in graphs and charts, and communicating about them are very important in making sense of the world around them. Under this activity, student may choose a variety of topics, develop survey questionnaires, collect information, and present them in a logical manner. In case of Applied Mathematics, it is expected that students develop at least one survey item during each grade.

3. **Research Reports:** Students can also be engaged in developing research reports based on specific questions/conjectures/hypotheses that could be assessed on the basis of available information. In such a task, students follow a sequence of steps and complete the drafting of the report that substantially respond to the question or hypothesis. Oftentimes, the widely accepted structure of report writing can be provided for the students. It is expected that each student produces one research project in each grade.
4. **Presentations:** Another key learning activity for Applied Mathematics entails a series of presentations performed by students. The presentation items might include their research reports, results of recently assigned tasks, collaborative group projects, and their explorations of concepts and ideas being discussed. Likewise, presentations can be used as the precursor to the discussion of key topics. It is suggested that well-planned, structured and brief presentations engage learners in a better way. It is envisaged that one student makes at least two presentations during each grade.
5. **Formative Written Tests:** It has also been expected that along with other activities, students shall also be engaged in formative written tests which could be brief and frequent in nature. These tests provide an opportunity for teachers and learners to identify their strengths and weaknesses as a recourse to improving their learning. Armed with the notion of assessment as learning, teachers may use these tests for variety of purposes such as to identify the status of prerequisite knowledge among students on a particular concept, to measure the achievement in a particular content area, and to develop remedial strategies on a topic that is deemed difficult for learners.
6. **Collaborative Group Projects:** Students can be assigned with collaborative group projects with a view to addressing a multi-task problem which cannot be solved by a single person. Careful task division among the group members is the prerequisite for the successful completion of the task. It is said that collaborative group projects may require longer time (i.e. one week to one month) to accomplish the task. In case of Applied Mathematics, students can be assigned with one group project during the term, thereby totalling three such projects in each grade.
7. **Quizzes:** Quizzes are considered important means for covering informational dimensions of Applied Mathematics. Teachers may use quizzes on a regular basis with a view to assess learners' ability to understand, relate, and compare different mathematical notions, concepts and ideas. As a means for learning and teaching, quizzes would be helpful to quickly survey the status learners' repertoire of knowledge on a particular topic.

b. External Evaluation

External evaluation of the students will be based on the written examination. It carries 75% of the total weightage. The types and number of questions will be as per the test specification chart developed by the Curriculum Development Centre.

Business Mathematics

Grades: 11 and 12

Subject code: Bmt. 405 (Grade 11), Bmt. 406 (Grade 12)

Credit hrs: 5

Working hrs: 160

1. Introduction

Business primarily revolves around the financial transaction or products that have some monetary value. Involvement of finance makes it extremely important to have sufficient knowledge about the basics of calculations. This is where business mathematics comes into play. It deals with the fundamental topics that one needs to carry out business related calculations. Realizing the necessity to impart the same on students, the curriculum has been developed for Grades 11 and 12 so as to prepare them for job market and for higher studies.

The curriculum of Business Mathematics for Grade 11 and 12 is designed to equip the students with mathematical and statistical concepts applicable in business and economics. The purpose of this course, then, is to present mathematical and statistical skills and concepts so that the students will be able to use them in management, economics, and social sciences. As mathematics and statistics are widely used in economics, business and finance, the students need a certain level of skill and understanding of the basic mathematical and statistical methods. The pedagogical approaches in delivering the course should consider the balance between theory and practice. In doing so, students should provide ample opportunities of working actively in real-world problems. The same applies in case of student evaluation procedure too.

The curriculum has different sections: level-wise competencies, grade-wise learning outcomes, contents and their elaboration, suggested project works, learning facilitation process and the assessment procedure. The major content areas included in this course are: algebra, calculus, financial mathematics, linear programming, statistics and probability.

2. Level-wise Competencies

By the end of the grade 12, the students will have the following competencies.

1. Understand the concepts of algebra and employ a variety of thinking processes and strategies to truly understand the concepts that underlie the business problems.
2. Apply calculus in business and economics fields.
3. Apply partnership, present worth and discount, arithmetic sequence and series, geometric sequence and series, compound interest and depreciation, NPV and IRR, annuity in business and many other field.
4. Maximize the profit and minimize the cost under very limited resources used.
5. Apply statistical knowledge and skills for their personal development and future career pathways, and analyze the data using Ms. Excel.
6. Develop appropriate process skills for the acquisition and application of mathematical concepts and skills.
7. Apply mathematical and statistical knowledge and skills for their personal development and future career pathways.
8. Apply modern technology to solve problems related to business and economic fields.

3. Grade-wise Learning Outcomes

S. N.	Content Area	Grade 11	Grade 12
1	Algebra	1.1 Define functions, inverse and composite functions. 1.2 Draw the graphs of linear functions. 1.3 Find the slope and intercepts of a line. 1.4 Solve linear inequalities and use their properties. 1.5 Define absolute values and use their properties (without theoretical proof). 1.6 Apply the linear functions in economics and management. 1.7 Solve system of linear equations. 1.8 Solve economic problems involving systems of linear equations. 1.9 Solve quadratic equations, quadratic inequalities. 1.10 Sketch the graph of a quadratic function with its main characteristics. 1.11 Solve economic and management problems involving quadratic equations. 1.12 Define exponential and logarithmic functions. 1.13 Solve exponential and logarithmic equations. 1.14 Solve economic and management problems involving exponential and logarithmic functions. 1.15 Use excel for graphing linear and quadratic functions and for solving related equations.	1.1 Perform matrix operations. 1.2 Use laws of matrix algebra. 1.3 Find the transpose of a matrix. 1.4 Evaluate determinants (up to third order). 1.5 Find adjoint and inverse of a matrix. 1.6 Solve system of linear equations by Cramer's rule, inverse matrix method and Gauss elimination method. 1.7 Solve problems of input/output analysis. 1.8 Use excel in solving problems of matrix algebra.

2	Calculus	<p>2.1 Define the limit of a function.</p> <p>2.2 Finding the limits of algebraic functions.</p> <p>2.3 Define and test continuity of a functions.</p> <p>2.4 Define the derivative of a function.</p> <p>2.5 Find the derivatives by using rules of differentiations.</p> <p>2.6 Differentiate implicit and parametric functions.</p> <p>2.7 Find higher-order derivatives up to third order.</p> <p>2.8 Use differentiation in marginal analysis.</p> <p>2.9 Define integration as the reverse process of differentiation.</p> <p>2.10 Integrate using rules/methods of integration (by decomposition of the integrand, by substitution and by parts).</p> <p>2.11 Find the total cost, total revenue and total profit functions.</p> <p>(Note: Derivatives and anti-derivatives of algebraic, logarithmic and exponential functions only.)</p>	<p>2.1 Define monotonic functions and test the monotonicity.</p> <p>2.2 Identify stationary point and point of inflection.</p> <p>2.3 Solve problems related elasticity of demand.</p> <p>2.4 Acquaint with relation between the marginal revenue, average revenue and elasticity of demand.</p> <p>2.5 Optimize functions of one variable using derivatives.</p> <p>2.6 Define the definite integral using the Fundamental Theorem of Calculus.</p> <p>2.7 Find the area under a curve (simple problems only).</p> <p>2.8 Solve problems of marginal analysis, consumer and producer surplus.</p> <p>2.9 Solve first-order linear differential equations with constant coefficient and constant term.</p> <p>2.10 Solve differential equations for limited and unlimited growth.</p> <p>2.11 Dynamics of market price function(Dynamic analysis0)</p>
3	Financial Mathematics	<p>3.1 Solve problems of partnership, present worth and discount.</p> <p>3.2 Define arithmetic sequences and series.</p> <p>3.3 Solve the problem related to A.P</p> <p>3.4 Solve economics and business problems involving arithmetic sequences and series.</p> <p>3.5 Use excel in solving problems of financial mathematics.</p>	<p>3.1 Solve problems of geometric sequence and series.</p> <p>3.2 Solve problems of compound interest and depreciation.</p> <p>3.3 Find net present value and internal rate of return.</p> <p>3.4 Compare investment projects.</p> <p>3.5 Solve problems of ordinary annuity, annuity due, deferred annuity, perpetuities and sinking funds.</p>

			3.6 Use excel in solving problems of financial mathematics.
4	Linear Programming Problem	<p>4.1 Find graphical solutions of a system of linear inequalities.</p> <p>4.2 Solve LP problems by graphical method and apply them in economics.</p> <p>4.3 Use excel in graphing linear inequalities and solving LPP by graphical method.</p>	<p>4.1 Define standard LP Problems.</p> <p>4.2 Solve LP Problems by simplex method and its application in business and economics.</p> <p>4.3 Solve standard minimization LP Problems using duality.</p>
5	Statistics	<p>5.1 Divide the dataset into classes.</p> <p>5.2 Build cumulative frequency distribution.</p> <p>5.3 Find arithmetic and weighted arithmetic means, correct mean, median, partition values (quartiles, deciles and percentiles) and mode.</p> <p>5.4 Find the missing frequencies when total frequency and either mean, median or mode are given.</p> <p>5.5 Do appropriate choice of an average.</p> <p>5.6 Find range, quartile deviation, mean deviation, standard deviation and their relative measures.</p> <p>5.7 Find variance, coefficient of variation and combined standard deviation.</p> <p>5.8 Find the correct standard deviation.</p> <p>5.9 Use excel in solving problems of central tendency and dispersions.</p>	<p>5.1 Find Karl Pearson's and Bowley's coefficient of skewness.</p> <p>5.2 Find the five number summary of raw data.</p> <p>5.3 Define correlation and find correlation coefficient by Karl Pearson's method and interpret the result.</p> <p>5.4 Define regression and find regression lines of Y on X and X on Y using least square method.</p> <p>5.5 Use excel in solving problems of Skewness, Correlation and Regression.</p>

6	Probability	<p>6.1 State the basic principles of counting and solve related problems.</p> <p>6.2 Find permutations of set of objects all different and set of objects not all different (simple cases only) and solve the problems related to combinations (simple cases only).</p> <p>6.3 State mathematical and empirical definition of probability.</p> <p>6.4 Solve the simple problems of probability using combinations.</p> <p>6.5 Acquaint with dependent and independent events.</p> <p>6.6 State two basic laws of probability and use it to solve related simple problems.</p> <p>6.7 Use excel in solving problems of permutation, combination and probability.</p>	<p>6.1 Define conditional probability and solve the related problems.</p> <p>6.2 Use multiplication law of probability for dependent events.</p> <p>6.3 State and apply the Bayes' theorem (simple problems only).</p> <p>6.4 Define mathematical expectation and variance of a discrete random variable and solve related problems.</p> <p>6.5 Define binomial distribution.</p> <p>6.6 Use characteristics of the binomial distribution to solve the simple problems only.</p> <p>6.7 Find mean and standard deviation of the binomial distribution.</p> <p>6.8 Use excel in solving problems of conditional probability, Bayes' theorem, Expected Value, Binomial Probability.</p>
---	-------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

4. Scope and Sequence of Contents

S. N.	Content Area	Grade 11		Grade 12	
		Elaboration of Contents	Working hrs	Elaboration of Contents	Working hrs
1	Algebra	<p>1.1 Linear Functions, Equation and Inequalities</p> <ul style="list-style-type: none"> ○ Functions ○ Inverse and composite functions ○ Linear Equations ○ Linear Functions and their graphs ○ Slope and intercepts of a line ○ Inequalities and their 	21	<p>1.1 Matrices and Determinants</p> <ul style="list-style-type: none"> ○ Matrix and its Operations ○ Laws of Matrix Algebra ○ Transpose of a matrix ○ Determinants (up to third order) ○ Adjoint and Inverse of a 	21

	<p>properties (without theoretical proof)</p> <ul style="list-style-type: none"> ○ Absolute values and their properties (without theoretical proof) <p>1.2 Applications</p> <ul style="list-style-type: none"> ○ Demand, supply, cost, revenue and Profit functions ○ Elasticity of demand, supply and income ○ Budget and cost constraints <p>1.3 System of linear equations</p> <ul style="list-style-type: none"> ○ Solving System of linear equations (Up to three variables) <p>1.4 Applications</p> <ul style="list-style-type: none"> ○ Supply and Demand Analysis ○ Break-Even Analysis ○ Consumer and producer surplus ○ National income determination <p>1.5 Quadratic Functions and Equations</p> <ul style="list-style-type: none"> ○ Quadratic Functions ○ Quadratic equations ○ Quadratic inequalities ○ Main characteristics (open upward and downward, domain and range, zeroes, vertex, axis of symmetry and intercepts) ○ Sketching the graph 		<p>matrix</p> <ul style="list-style-type: none"> ○ Elementary row operations ○ Solving System of linear equations (Up to three variables by using Cramer's rule, inverse matrix method and Gauss elimination method) ○ Input/output analysis <p>1.2 Comp. Work: Excel for matrix algebra</p>	
--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

		<p>of a quadratic function with its main characteristics</p> <p>1.6 Applications</p> <ul style="list-style-type: none"> ○ Supply and Demand Analysis ○ Break-Even Analysis ○ Optimization <p>1.7 Exponential and Logarithmic functions</p> <ul style="list-style-type: none"> ○ Exponential functions ○ Logarithmic functions and their properties ○ Natural and common logarithms ○ Exponential and Logarithmic equations ○ Economics and Management Applications <p>1.8 Comp. Work: Excel for linear and quadratic functions and equations</p>			
2	Calculus	<p>2.1 Limit and Continuity</p> <ul style="list-style-type: none"> ○ Limit of a function ○ Procedure of finding Limit ○ Limit at infinity ○ Continuity of a function <p>Note: Algebraic function only</p> <p>2.2 Differentiation</p> <ul style="list-style-type: none"> ○ Derivatives ○ Average and Instantaneous Rates of Change 	40	<p>2.1 Applications of Derivatives</p> <ul style="list-style-type: none"> ○ Monotonic functions ○ Stationary point and Point of inflection ○ Elasticity of demand and the derivatives ○ Relation between the marginal revenue, average revenue and elasticity of demand ○ Optimization of 	40

		<ul style="list-style-type: none"> ○ Rules of differentiations ○ Implicit and parametric Differentiation ○ Higher-Order Derivatives upto third order <p>Note: Algebraic, exponential and logarithmic function only</p> <p>2.3 Applications</p> <ul style="list-style-type: none"> ○ Marginal cost, Marginal revenue and Marginal profit <p>2.4 Indefinite Integration</p> <ul style="list-style-type: none"> ○ Integration as the reverse process of differentiation ○ Rules of integrations ○ Total cost, total revenue and total profit function 		<p>functions of one variable</p> <ul style="list-style-type: none"> ○ Economic application of maximum and minimum points (Algebraic function only) <p>2.2 Definite Integral and its Applications</p> <ul style="list-style-type: none"> ○ Definite Integral using the Fundamental Theorem of Calculus ○ Area Under a Curve (simple problems only) ○ Marginal analysis ○ Consumer and Producer Surplus <p>2.3 Differential equations and Applications</p> <ul style="list-style-type: none"> ○ Differential equations and necessary terminologies ○ Solution of first-order linear differential equations with constant coefficient and constant term ○ Differential equations for limited and unlimited growth ○ Dynamics of market price functions (Dynamic 	
--	--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

				analysis)	
3	Financial Mathematics	3.1 Financial Mathematics <ul style="list-style-type: none"> ○ Partnership ○ Present worth and Discount ○ Arithmetic Sequences and series and their applications 3.2 Comp. Work: Excel for financial mathematics	17	3.1 Financial Mathematics <ul style="list-style-type: none"> ○ Geometric sequence and series ○ Compound Interest and Deprecation ○ Net present value and internal rate of return ○ Ordinary annuity ○ Annuity due ○ Deferred annuity ○ Perpetuities ○ Sinking funds 3.2 Comp. Work: Excel for financial mathematics	17
4	Linear Programming Problem	4.1 Linear Programming Problem <ul style="list-style-type: none"> ○ Linear inequalities and their graphical solutions ○ Graphical method of solving LPP ○ Application of LPP in economics and business 4.2 Comp. Work: Excel for graphical method of solving LPP	10	4.1 Linear Programming Problem <ul style="list-style-type: none"> ○ Standard LP Problems ○ Simplex method of solving linear programming problem (two decision variables only) ○ Duality and Standard Minimization LP Problems 4.2 Comp. Work: Online Simplex Method	10

5	Statistics	<p>5.1 Measures of central Tendency</p> <ul style="list-style-type: none"> ○ Exclusive and inclusive classes, cumulative frequency distribution and open end classes ○ Mean (arithmetic and weighted arithmetic means) ○ Combined mean of two series ○ Median ○ Partition values ○ Mode ○ Choice of an average <p>5.2 Measures of Dispersion</p> <ul style="list-style-type: none"> ○ Range and its relative measure ○ Quartile deviation and its relative measure ○ Mean deviation from mean and median and their relative measures ○ Standard deviation and its relative measure ○ Coefficient of Variation ○ Variance ○ Combined standard deviation <p>5.3 Comp. Work: Excel for central tendency and dispersion</p>	20	<p>5.1 Skewness</p> <ul style="list-style-type: none"> ○ Karl Pearson's and Bowley's coefficient of skewness <p>5.2 Correlation</p> <ul style="list-style-type: none"> ○ Correlation Coefficient by Karl Pearson's method and its Interpretations <p>5.3 Regression</p> <ul style="list-style-type: none"> ○ Regression lines of Y on X and X on Y by least square method <p>5.4 Comp. Work: Excel for Skewness, five number summary of raw data, Correlation and Regression</p>	20
---	-------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----

6	Probability	<p>6.1 Permutation and Combination</p> <ul style="list-style-type: none"> ○ Basic Principles of counting ○ Permutation: Set of objects all different, set of objects not all different (simple cases only) ○ Combination of things all different (simple cases only) <p>6.2 Probability</p> <ul style="list-style-type: none"> ○ Mathematical and empirical definition of probability ○ Dependent and Independent Events ○ Basic laws of probability (without theoretical proof) <p>6.3 Comp. Work: Excel for Permutation, combination, probability and basic laws of probability.</p>	12	<p>6.1 Probability</p> <ul style="list-style-type: none"> ○ Conditional probability ○ Multiplication Law of probability (dependent events only) ○ Bayes' theorem <p>6.2 Random Variables</p> <ul style="list-style-type: none"> ○ Mathematical expectation and Variance of Discrete Random Variable <p>6.3 Binomial Distribution</p> <ul style="list-style-type: none"> ○ Binomial distribution ○ Characteristics of the Binomial Distribution ○ Mean and Standard Deviation of the Binomial Distribution <p>6.4 Comp. Work: Excel for Conditional probability, Bayes' theorem, Expected Value, Binomial Probability</p>	12
Total			120		120

5. Suggested Practical/Project Activities

During project works, students learn by actively engaging in real-world. Project work allows the students to study, do research and act by themselves using their abilities, interests, personal experience and aptitudes. Doing the computer works using excel requires students solve and analyze mathematical and statistical problems.

Each Student should do one project work or computer work (in the given table below, the second row in each content areas contains the project works and content areas where there is only one row the task is designed for project work) from each of six content areas and should give a 15-minute presentation. The project works or computer works will be documented in a file and will be submitted at the time of practical evaluation. Out of the project works, anyone can be presented at the time of practical evaluation.

Whatever the style, the project work should include the following points:

- Historical background
- Description
- Key features or properties
- Relationship with others
- Geometrical illustrations
- Practical significance
- Varieties of examples other than those given in the textbook
- Limitations
- Varieties of problems with solutions other than those given in the textbook
- Use in everyday life, business, economics, finance, etc.
- Conclusion

The project works will be evaluated on the basis of clarity of aims, originality, presentation style and the skills demonstrated.

S. N.	Content Area	Tasks	Working Hours
Grade 11			
1	Algebra	<ul style="list-style-type: none"> ○ Calculating numerical expressions and creating function tables. ○ Graph linear functions and equations and finding intersection points using excel. ○ Solving equations using the quadratic formula, SOLVER, and graphs. ○ Evaluating expressions involving exponential and logarithms using excel. ○ Sketching graph of exponential and logarithmic functions using excel. 	7
		<ul style="list-style-type: none"> ○ Functions in the real world. ○ Linear functions and linear equations in the real world. ○ Linear functions and inequalities in events of daily lives. 	

		<ul style="list-style-type: none"> ○ Quadratic functions in the real world. ○ Application of quadratic equation and inequality in real life situation. ○ Sketching and drawing graphs of linear and quadratic functions. 	
2	Calculus	<ul style="list-style-type: none"> ○ Calculus in daily life. ○ Continuity of a function applied in everyday life. ○ Applications of derivatives in Business and Economics. ○ Applications of Calculus in day to day life. ○ Integration in the real world. ○ Application of integration in business and economics. 	7
3	Financial Mathematics	<ul style="list-style-type: none"> ○ Solving problems on present worth and discount. ○ Solving problems on arithmetic sequence and series using excel <hr/> <ul style="list-style-type: none"> ○ Partnership of sharing profit in the real world. ○ Applications of present worth and discount in daily life events. ○ Applications of arithmetic sequence and series in daily life events. 	6
4	Linear Programming Problem	<ul style="list-style-type: none"> ○ Solving LP problems using Solver. <hr/> <ul style="list-style-type: none"> ○ Applications of Linear programming problem in Economics and Business. 	5
5	Statistics	<ul style="list-style-type: none"> ○ Calculating mean, median, partition values and mode for individual series, discrete series and continuous series using excel. ○ Calculating combined mean of two series using excel. ○ Calculating maximum value, minimum value, range, quartile deviation, mean deviation, standard deviation and variance for individual series, discrete series and continuous series using excel. ○ Calculating coefficient of range, coefficient of quartile deviation, coefficient of mean deviation and coefficient of variation for individual series, discrete series and continuous series using excel. 	11

		<ul style="list-style-type: none"> ○ Investigation on how people use mean, median and mode in their daily life events. ○ Choice of averages ○ Measures of dispersion applied to events in real life situations. 	
6	Probability	<ul style="list-style-type: none"> ○ Solving some problems on permutation and combination using excel. ○ Finding probability of an event and probability of an event involving combination using excel. ○ Finding the probability related to two basic laws of probability using excel 	4
		<ul style="list-style-type: none"> ○ Investigation on how probability is used in real life. 	
Total			40
Grade 12			
1	Algebra	<ul style="list-style-type: none"> ○ Performing basic operations on matrices using excel. ○ Evaluating a determinant of a Matrix using excel. ○ Solving system of linear equations using matrices. ○ Solving problems involving a Leontief input–output model using excel. 	7
		<ul style="list-style-type: none"> ○ Applications of matrices in real life. ○ Methods of solving system of linear equations by using Cramer’s rule, inverse matrix method and Gauss elimination method. 	
2	Calculus	<ul style="list-style-type: none"> ○ Applications of maxima and minima of one variable in daily life. ○ Calculating consumer surplus and producer surplus using definite integral. ○ Applications of differential equations with constant coefficient and constant term in economics. 	7
3	Financial Mathematics	<ul style="list-style-type: none"> ○ Solving some problems of geometric sequence and series using excel. ○ Solving some problems of compound interest and depreciation using excel. ○ Solving some problems of net present value and internal rate of return using excel. ○ Solving some problems on amount of immediate annuity 	6

		<p>and annuity due using excel.</p> <ul style="list-style-type: none"> ○ Solving some problems on present value of immediate annuity and annuity due using excel. ○ Solving some problems on present value of deferred annuity using excel. ○ Solving some problems on present value of perpetual annuity using excel. 	
		<ul style="list-style-type: none"> ○ Investigation on geometric sequence and series can be applied in real life situations. ○ Applying the concept of compound interest and depreciation in all areas of life. ○ Net present value (NPV) and internal rate of return (IRR) methods for project evaluation. ○ Calculating amount and present values of annuities in real life situations. 	
4	Linear Programming	<ul style="list-style-type: none"> ○ Simplex method of solving linear programming problem(LPP) 	5
		<ul style="list-style-type: none"> ○ Simplex method of solving linear programming problem(LPP) 	
5	Statistics	<ul style="list-style-type: none"> ○ Calculating Karl Pearson's and Bowley' coefficient of skewness for individual series, discrete series and continuous series using excel. ○ Calculating five number summary for individual series, discrete series and continuous series using excel. ○ Calculating Karl Pearson's correlation coefficient using excel. ○ Estimating regression lines of Y on X and that of X on Y using excel. 	11
		<ul style="list-style-type: none"> ○ Skewness in statistics. ○ Calculating correlation coefficient by Karl Pearson's method and its interpretation in real life situations. ○ Estimating simple regression lines of Y on X and X on Y in real life situations. 	
6	Probability	<ul style="list-style-type: none"> ○ Solving some problems on conditional probability and Bayes' theorem using excel. ○ Finding expected value and variance of discrete random variable using excel. ○ Finding the probability of an event of binomial distribution 	4

	using excel. ○ Finding the mean and standard deviation of binomial distribution using excel.	
	○ Developing conceptual understanding of Conditional Probability and Bayes' theorem through explanation. ○ Developing conceptual understanding of Binomial distribution through explanation.	
	Total	40

Pre-requisites for computer based tasks: Spreadsheets Introduction, Files, Cells, Cell Address, Cell Format, Cell Content, Cell Value, Formulas, Copy, Paste, Fill, Charts, Conclusion.

6. Learning Facilitation Methods and Process

The following principles should guide the learning facilitation of business mathematics:

- One of the most important principles in teaching mathematics is "**Let It Make Sense**". The course assumes minimal mathematical background but includes the usefulness and relevance of basic mathematics in economics, finance, and business.
- **Students need to be able to navigate their lives in this ever-so-complex modern world.** This involves dealing with interest, annuities, taxes, loans, purchases, budgeting etc. Our youngsters need to be able to handle money wisely. All that requires good understanding of parts, proportions, and percentages.
- Another very important approach of mathematics education as a whole is to **enable the students to understand information around us.** In today's world, this includes quite a bit of scientific information. Being able to read through it and make sense of it requires knowing statistics and probability.
- We need to **prepare our students for further studies.** Not everyone ultimately needs algebra, calculus, linear programming, but many do, and teens don't always know what profession they might choose or end up with.
- **Let students see some beauty of mathematics and learn to like it,** or at the very least, make sure they don't have negative feeling towards mathematics.
- Finally, **let students be familiar with modern computation skill.** This involves working with excel.

It's important to **learn how to use any tool** the student might acquire. Quantity won't equal quality. Knowing a few "math tools" inside out is more beneficial than a mindless dashing to find the newest activity to spice up the math lessons. In this course, we do not show how the mathematical results have been obtained and proved, but we show how they may be used in real-life economics and business.

Gaining purposeful learning experiences through solving problems in relevant and meaningful contexts allows students to view mathematics in a practical setting relevant to their intended careers, and also motivates them to move on to increasingly more abstract concepts.

Teacher has to analyze and diagnose the weakness of the students and create appropriate learning environment to solve mathematical problems in teaching learning process. The

following are some of the methods and techniques which can be used in delivering this course.

- Problem solving
- Case study
- Project work
- Question answer
- Discussion
- Discovery
- ICT
- Co-operative learning
- Lecture

7. Student Assessment

Continuous assessment of students for formative purpose will be an integral part of teaching learning process. Student's summative evaluation will be done using both internal (25%) and external examination (75%).

(a) Internal Evaluation

Practical evaluation includes written tests (first term, second term), classroom participation and project work including presentation /excels lab work. The scores of evaluation will be used for providing feedback and to improve their learning. The criteria for internal evaluation is shown in the following table:

S. N.	Criteria	Marks
1	Classroom participation (Daily attendance, home assignment and classwork, participation in learning, participation in other activities)	3
2	Trimester exam (3 marks from each trimester exam)	6
3	Project work, project report and presentation	16
	Total	25

(b) External Evaluation

External evaluation of the students will be based on the written examination. It carries 75 percent of the total weightage. The types and number questions will be as per the test specification chart developed by the Curriculum Development Centre.

Library and Information Science

Grade: 11 and 12

**Subject Code: Lis. 409 (Grade 11),
Lis. 410 (Grade 12)**

Credit Hour: 5

Working hours: 160

1. Introduction

A library is one of the important service centers for education institutions for the development and advancement of an individual knowledge as well as for a society as a whole. Its main objective is not only to fulfil the information needs of users but also to motivate them to make the maximum utilization or exploitation of the availability of various information and knowledge resources. To fulfill this objective, well trained and educated professional are needed. So, the study and teaching of library and information science from the school to University level is essential to produce various levels of professionals.

Library and Information Science is one of the important branches of knowledge that deals with essential competencies for scientific organization and management of all types of libraries and knowledge centers. This curriculum for grade 11 and 12 has been prepared to produce qualified and competent mid-career professionals who can properly handle all types of libraries and knowledge centre with professional ethics.

The curriculum prepared in accordance with National Curriculum Framework is structured for two academic years in such a way that it incorporates the level-wise competencies, grade-wise learning outcomes, scope and sequence of contents, suggested practical/project activities, learning facilitation process and assessment strategies so as to enhance the learning on the subject systematically.

2. Level-wise competencies

At the end of grade 12, the curriculum aims at developing the following competencies in the learners:

1. Acquire the basic knowledge of Library and Information Science
2. Enhance the basic knowledge about information sources
3. Identify the role, functions and services of different types of libraries
4. Apply the technique used for the scientific management of knowledge center
5. Perform all the necessary mandates of circulation and reference services
6. Enhance the basic concepts of Information and Communication Technology (ICT)
7. Organize and update manual as well as computerized housekeeping operations
8. Organize and manage serials and non-book materials
9. Update the history, development, role and functions of national and international professional organizations, library policies and legislations
10. Maintain library record, brochure and annual reports.

1. Grade-wise Learning Outcomes

Grade 11

Unit	Content Area	Learning Outcomes
1	Library, Information and Society	<p>1.1 Describe the concept of Library and Information Science.</p> <p>1.2 Explain the importance, objectives, roles and functions of a library in society.</p> <p>1.3 Describe the historical development of libraries in the world.</p> <p>1.4 State the history and development of libraries in Nepal.</p> <p>1.5 Apply Five Laws of Library Science in day to day practice.</p>
2	Types of Libraries	<p>2.1 Describe the role, functions, collection, services of national library.</p> <p>2.2 Describe the role, functions, collection, services of academic libraries.</p> <p>2.3 Recognize the role, functions, collection, services of public and a community library.</p> <p>2.4 Reflect the role, functions, collection, services of special library.</p>
3	Library Management	<p>3.1 Explain the concept of library management and principles of POSDCoRB</p> <p>3.2 Decide the importance of human resources in the libraries.</p> <p>3.3 Describe the need of a proper library building, furniture, equipment and stationaries.</p> <p>3.4 Assist to prepare library budget.</p> <p>3.5 Assist to form a library committee.</p> <p>3.6 Apply the library rules and regulation for proper management.</p>
4	Collection Development	<p>4.1 Describe various types of documents</p> <p>4.2 Use the book selection tools</p> <p>4.3 Select and acquire necessary library documents from various sources and by various methods</p> <p>4.4 Accession the acquired documents properly</p>
5	Library Classification	<p>5.1 Identify the concept, importance, and objectives of library classification.</p>

		<p>5.2 Describe the types of library classification schemes.</p> <p>5.3 Determine the major subject(s) of a book.</p> <p>5.4 Describe the salient features of the Dewey Decimal Classification (DDC).</p> <p>5.5 Explain the structure and number building process of DDC.</p> <p>5.6 Classify simple books broadly by using class number from 10 main classes or 100 divisions or 1000 sections as needed.</p> <p>5.7 Build appropriate call number.</p>
6	Library Cataloguing and Subject Heading Assignment	<p>6.1 Describe the importance, objectives and functions of library cataloguing</p> <p>6.2 Differentiate between a library catalogue and a bibliography</p> <p>6.3 Identify the types and forms of library catalogue</p> <p>6.4 Explain and show different parts of a book</p> <p>6.5 Apply the cataloguing rules: Anglo American Cataloguing Rules 2nd Edition (AACR2)</p> <p>6.6 Identify the salient features of AACR2</p> <p>6.7 Prepare necessary catalogue cards: Main card, Shelf list card, Subject card, Title outer card, etc. by following AACR2</p> <p>6.8 Examine the concept, need, and objectives of subject heading</p> <p>6.9 Recognize the basic principles of Sears List of Subject Headings for assigning proper subject heading(s) for a given book</p>
7	End Processing and Book Shelving	<p>7.1 Describe the concept and importance of end processing work</p> <p>7.2 Write call number in proper page of a book</p> <p>7.3 Prepare and paste book pocket, book card, due date slip and spine label in proper places of a book</p> <p>7.4 Perform card typing and filing</p> <p>7.5 Shelve new books in proper racks according to their call number</p>
8	Circulation System	<p>8.1 Describe the concept, importance and functions of circulation system</p> <p>8.2 Identify the membership procedure and need of property counter</p> <p>8.3 Describe the traditional and modern charging and discharging systems</p>

		<p>8.4 Use appropriate charging and discharging system specially modified Browne Newark system or computer barcode charging system</p> <p>8.5 Perform renew, reserve, overdue, fine and reminder works</p> <p>8.6 Perform regular stack reading and shelving of used and returned books</p>
9	Preservation and Conservation (PAC)	<p>9.1 Explain the importance of preservation and conservation (PAC) of library resources.</p> <p>9.2 Identify the enemies and harmful factors of library materials and use protective measures.</p> <p>9.3 Identify causes of book theft and use various control methods.</p> <p>9.4 Apply various types of other preservation methods such as binding, digitization, etc.</p> <p>9.5 Perform stock verification and weeding.</p>
10	Practical works	<p>10.1 Develop the skills on selection, acquisition and accessioning book and non-book materials.</p> <p>10.2 Develop the library classification skills for managing the library documents.</p> <p>10.3 Develop the cataloguing skills (Author Entry up to three authors, title entry)</p> <p>10.4 Prepare and manage End processing, card filing and book shelving</p> <p>10.5 Handle and manage circulation system and shelving</p>

Grade 12

Unit	Content Area	Learning Outcomes
1.	Information: Concept, Types and Sources	<p>1.1 Relate the concept of data, information and knowledge</p> <p>1.2 Identify sources of information and learn about use of information.</p> <p>1.3 Differentiate primary, secondary and tertiary sources of information.</p>
2	Application of Information and Communication Technology (ICT) in Libraries	<p>2.1 Describe the concept and need of ICT in libraries.</p> <p>2.2 Develop knowledge about computer hardware and software.</p> <p>2.3 Apply information search and retrieval techniques.</p> <p>2.4 Use e-resources and online resources.</p> <p>2.5 Apply information literacy skills.</p>
3	Library Automation	<p>3.1 Describe library automation, its concept and importance.</p> <p>3.2 Develop basic concept about Resource Description and Analysis (RDA) and Machine-Readable Catalogue (MARC).</p>

		<p>3.3 Enhance the knowledge and skills about library automation software:</p> <ul style="list-style-type: none"> ▪ Perform data entry work and edit and update database using suitable software ▪ Search and retrieve necessary information from computerized database ▪ Apply barcode charging and discharging system for circulation
4	Library and Information Services	<p>4.1 Describe library and information services, its need and importance.</p> <p>4.2 Organize knowledge of user education.</p> <p>4.3 Acquire basic knowledge about Current Awareness Service (CAS) and Selective Dissemination of Information (SDI) service.</p> <p>4.4 Develop the required skills to provide other services such as Inter-library loan, Information search and retrieval services, Web based service, Referral service, photocopy and printing services, etc.</p>
5	Reference Services and Tools	<p>5.1 Describe concept, importance and types of reference services.</p> <p>5.2 Explain the concept and need of reference tools and sources.</p> <p>5.3 Describe different reference tools (Dictionaries, Encyclopedias, Directories, Atlases, Maps, Globes, Biographies, Yearbooks, Statistical books, Catalogues, Bibliographies, General knowledge books, Online and offline digital resources, etc.) and their use.</p>
6	Library Legislation and Policies	<p>6.1 Apply ethics of Librarianship</p> <p>6.2 Familiar on library legislation and policies</p> <p>6.3 Describe the concept and importance of copyright law</p> <p>6.4 Explain legal provisions and policies of Nepal on library and information sector</p>
7	Library Associations	<p>7.1 Explain need, role and importance of library associations of different level.</p> <p>7.2 Introduce the history, development, role, functions and activities of Nepal Library Association (NLA).</p> <p>7.3 Introduce the history, development, role, functions and activities of International Federation of Library Associations and Institutions (IFLA).</p>
8	Periodical and Non-Book Material Management	<p>8.1 Identify the importance, objectives and management of different types of periodicals.</p> <p>8.2 Identify periodical selection tools.</p> <p>8.3 Select and acquire necessary periodicals by different methods.</p>

		<p>8.4 Record and display nascent and retrospective periodicals systematically.</p> <p>8.5 Explain the importance and role of various types of non-book materials (Brochures, Pamphlets, Leaflets, Audio-visual materials, Maps, Atlases, CDs, DVDs Microfilms, Slides, etc.).</p> <p>8.6 Evaluate importance and objectives of non-book material management.</p> <p>8.7 Select, acquire and sort out different types of non-book materials properly and manage them systematically.</p>
9	Library Statistics, Publications and Annual Report	<p>9.1 Explain the importance and objectives of library statistics, publications and annual reports.</p> <p>9.2 Maintain records of various activities of the library and assist to compile library statistics.</p> <p>9.3 Assist to publish library brochure, newsletters, and website.</p> <p>9.4 Prepare and publish library annual report.</p>
10	Internship (Library Attachment) for One Week	<p>10.1 Visit a library to collect the following information, prepare a report and submit it.</p> <p>10.2 Book selection, acquisition and accessioning</p> <p>10.3 Technical processing: classifying, cataloguing, subject heading/keyword assigning, card preparing</p> <p>10.4 Data entry and editing in database</p> <p>10.5 End processing and book shelving</p> <p>10.6 Performing circulation work</p> <p>10.7 Providing information search and retrieval service</p> <p>10.8 Providing reference services using different tools</p> <p>10.9 Periodical selection, acquisition, recording, displaying and filling/shelving</p> <p>10.10 Recording various methods of preservation and conservation, etc.</p> <p>10.11 Compilation of statistics of all work done</p>

1. Scope and Sequence of Contents

Grade 11

Unit	Content Area	Elaboration of Contents	Working Hours
1	Library, Information and Society	<p>1.1 Concept of Library and Information Science</p> <p>1.2 Library: Definition, importance, objectives and functions of a library</p> <p>1.3 Relation between Information and library</p> <p>1.4 Role of Library in Modern society</p> <p>1.5 History and development of libraries (From clay tablets to e-tablets or digital library and virtual library)</p>	14

		1.6 History and development of libraries in Nepal 1.7 Five Laws of Library Science	
2	Types of Libraries	2.1 National library 2.2 Public and Community library 2.3 Academic library 2.4 Special library	14
3.	Library Management	3.1 Library administration and principles of POSDCoRB 3.2 Human Resource Management (HRM) 3.3 Library building, furniture, equipment and stationaries 3.4 Library budget 3.5 Library committee 3.6 Library rules	14
4.	Collection Development	4.1 Types of documents 4.2 Book selection tools 4.3 Selection and acquisition of various types of documents from various sources by different methods 4.4 Accessioning of collected documents	14
5	Library Classification	5.1 Concept, importance, objectives and purpose of library classification 5.2 Types and kinds of library classification schemes 5.3 Steps in determining thought contents or major subject(s) of a given book 5.4 Dewey Decimal Classification (DDC) 5.5.1 Introduction and salient features of DDC latest edition 5.3.2 Introduction to the ten main classes, hundred divisions and thousand sections of DDC. 5.3.3. Method of classification of books by using class numbers of DDC up to 1000 Sections 5.4 Call number building	20
6	Library Cataloguing and Subject Heading Assignment	6.1 Library cataloguing: Introduction, need, objectives and functions 6.2 Difference between a library catalogue and a bibliography 6.3 Types and forms of library catalogue 6.4 Parts of a book 6.5 Cataloguing rules: Anglo- American Cataloguing Rules 2nd Edition (AACR2) 6.5.1 Introduction and salient features of AACR2 6.5.2 Procedure of making different catalogue cards : Main card, Shelf list card, and added cards (Subject card, Title card, Joint author card, etc.) by following AACR2	18

		6.6 Subject heading assignment: Introduction, need and objectives 6.7 Steps in determining major subject(s) of a book 6.8 Subject heading lists: Sears List of Subject Headings (SLSH) 6.8.1 Introduction and principles of SLSH and its use 6.8.2 Assignment of appropriate subject heading(s) for a book by selecting from SLSH	
7	End Processing and Book Shelving	7.1 Introduction to end processing 7.2 Call number writing on the back of the last page of the book 7.3 Preparation or typing and pasting of book pocket, book card, due date slip, and spine label in proper place of the book 7.4 Card typing and filing 7.5 Book shelving in proper sequence and its maintenance	9
8	Circulation System	8.1 Concept, importance and functions of circulation system 8.2 Membership issue 8.3 Property counter and user attendance register 8.4 Charging and discharging systems 8.4.1 Browne System 8.4.2 Newark System 8.5 Renew, reserve, overdue, fine and reminder 8.6 Stack reading and used and returned book shelving	9
9	Preservation and Conservation	9.1. Introduction and need of preservation and conservation of various types of library resources 9.2 Enemies of and harmful factors for library materials and protection 9.3 Causes of book theft and their control 9.4 Different types of preservation methods (Binding, lamination, fumigation, digitization, etc.) 9.5 Stock verification and weeding	8
Total			120

Grade 12

Unit	Content Area	Elaboration of Contents	Working Hours
1	Information: Concept, types and sources	1.1 General concept of Data, Information, Knowledge 1.2 Sources of information (Book, non-book materials, human, and internet) 1.3 Types of information (Primary, secondary, and	10

		tertiary) 1.4 Use of information	
2	Application of Information and Communication Technology (ICT) in Libraries	2.1 Concept of information and communication technology (ICT) 2.2 Fundamentals of ICT: Hardware and software 2.2.1 Hardware: Input, Process, Storage and Output and basic networking devices etc. 2.2.2 System software: Windows, Linux etc. 2.2.3 Application Software: Office Automation System. 2.3 Internet searching and application 2.4 Information literacy	18
3	Library Automation	3.1 Library automation: Concept, and importance 3.2 Library automation software: Proprietary and free open source 3.3 Modules of library automation software: Cataloguing, Online Public Access Catalogue (OPAC), Circulation, etc. 3.4 RDA and MARC21 3.5 Practical on automation specially focusing on data entry, editing and updating, information search and retrieval, barcode charging and discharging, etc.	15
4	Library and Information Services	4.1 Concept purpose of library and information services 4.2 Users education 4.3 Library and information services: Current awareness services (CAS): Selective dissemination of information (SDI) Inter-library loan, Web based services, Referral service etc. 4.4 Printing and Photocopy service,	15
5	Reference Services and Tools	5.1 Concept, importance of reference services 5.2 Types of reference services 5.3 Concept and needs of reference tools 5.4 Reference tools (Dictionaries, Encyclopedias, Directories, Atlases, Maps, Globes, Biographies, Yearbooks, Statistical books, Catalogues, Bibliographies, General knowledge books, e-resources Online and offline digital resources, etc.) and their use	15

6	Library Legislation and Policies	6.1 Ethics of Librarianship 6.2 Provision and importance of library legislation and policies 6.3 Copyright law 6.4 Library and information related laws and policies in Nepal	12
7	Library Associations	7.1 National: Nepal Library Association (NLA) 7.2 International: International Federation of Library Associations and Institutions (IFLA)	8
8	Periodical and Non-book Material Management	8.1 Introduction and types of periodicals 8.2 Need and objectives of periodical management 8.3 Periodical selection and acquisition tools 8.4 Periodical recording, display and filing system 8.5 Introduction, importance and role of various types of non-book materials (Brochures, Pamphlets, Leaflets, Audio-visual materials, Maps, Atlases, CDs, DVDs Microfilms, Slides) 8.6 Importance and objectives of non-book material management 8.7 Selection and acquisition of different types of non-book materials from different sources 8.8 Recording, displaying and managing different types of non-book materials systematically in proper place	14
9	Library Statistics, Publications and Annual Reports	9.1 Introduction, importance and objectives of library statistics, publications and annual reports 9.2 Compilation of library statistics by recording various activities of the library 9.3 Publication of library brochure, newsletter 9.4 Annual report generation	13
Total			120

6. Suggested Practical/Experimental and Project Works

Following are some sample practical activities, teacher can assign any relevant practical activity as per requirement.

SN	Unit	Practical/Experimental and Project Works	Working Hours
1	Collection Development	<p>1. Selection, acquisition and accessioning methods</p> <p>The teacher, first of all, demonstrates students how to select necessary and useful books/documents from the book selection tools (Both printed and online) like:</p> <ul style="list-style-type: none"> • National publishers' catalogs/book lists such as Catalogs/Book Lists of Ratna Pustak Bhandar, Sajha Prakashan, Ekta Books, Vidyarthi Prakashan, Nepal Academy, etc. • Library catalogs such as Catalogs of Tribhuvan University Central Library (TUCL), of Nepal National Library (NNL), of Madan Puraskar Pustakalaya (MPP), etc. • Book reviews journals such as Book reviews published in different journals and newspaper • After selecting the necessary books, the teacher demonstrates various methods of acquisition such as: purchase, gift, exchange basis, etc. by preparing samples of order letter for purchasing, of request letter and acknowledgement letter for receiving books free of cost or gift, exchange letter for acquiring books and other publications on mutual exchange basis. • After collecting necessary books and documents by various methods, the teacher demonstrates the proper way of accessioning these books/documents in concerned accession registers: Purchased Book Register, Gift Book Register, Exchange Book Register, etc. • The page of an Accession Register consists 25 lines and 15 columns on two pages as follows: • The content of 15 columns of an Accession Register pages are as follows: <ol style="list-style-type: none"> 1. Date 2. Accession Number 3. Author 4. Title 5. Edn. 6. Place & Publisher 7. Year 8. Pages 	3

		<p>9. Vol. 10. Source 11. Cost 12. Class No. 13. Book No. 14. Bill No. & Date 15. Remark</p> <ul style="list-style-type: none"> • While accessioning any book, only one line should be allotted for writing necessary information about the book in concerned column as shown in the sample after writing the date of accession in the first column followed by Accession number column. • In case of long name of an author, only surname should be written in full form and forename in abbreviation in Author column. In case of more than one author, only name of the first author should be given followed by "and others". • If the title is too long, only first two or three words should be written followed by three dots (...) and the last word of the title of the book in Title column. • Except first edition, other edition should be written in short form as 2nd, 3rd, etc. in Edition column. • In Place & Publisher column, only the city name and publisher's name without Co. or Pvt. should be recorded. • The publication year of the recent edition not the reprint should be written in Year column. • The other information such as the last page no., vol. no., (If there is vol. no.), the name of the source (Individual or Institutional name) from where book is acquired, price of the book in Nepalese Rupees (Rs.) or in Indian Rupees (IC Rs.) or in Dollar (\$), Class no. and Book no. and Bill no. and date should be directly written in the concerned column as shown in the sample below: <ol style="list-style-type: none"> 1. Date: 2076/10/15 2. Accession Number: 01 3. Author: Lama, Sangpo 4. Title: High school essays 5. Edn.: 2nd. 6. Place & Publisher: Kathmandu: Ekta Books 7. Year: 2010 	
--	--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

		<p>8. Pages: 224</p> <p>9. Vol.</p> <p>10. Source: Ekta Books</p> <p>11. Cost: Rs.195/-</p> <p>12. Class No.: 824</p> <p>13. Book No.: LAM-h</p> <p>14. Bill No. & Date: 2001 - 2076/10/10</p> <p>15. Remark</p> <ul style="list-style-type: none"> • If the book is acquired free of cost and accessioned in the Gift Book Register, then G is written before the Accession No. such as G01. • The Accession No. should be written in two places of the accessioned book after stamping ownership stamp in those two places: one in the center of the verso of the main title page and next in the bottom of the clue page as 20 th page or some other page as decided in the Acquisition policy of the library. • After demonstrating the above methods of book selection, acquisition and accessioning, the teacher assigns each student with practical work or exercise for selecting, acquiring and accessioning about 10 -15 books in the Sample copy of an Accession Register. Then, he/she will correct the assignment submitted by the students. 	
2	Library Classification	<p>2. Classification</p> <ul style="list-style-type: none"> • The teacher demonstrates different steps to be followed for classifying various types of books by using class numbers up to 1000 sections of Dewey Decimal Classification (DDC) system as follows: • Determination of major subject or thought content of the given book by following various steps such as checking the table of contents, foreword, preface, introduction, information given in book jacket (If the jacket is there), bibliography/references, index, etc. of the book, if its title is not simple or does not reflect easily the subject of the book. • Searching of suitable Class no. from the Relative Index of the DDC • Checking of the searched Class no. for confirmation in the Main Class no. in the concerned schedule vol. of the DDC according to the Class no. • Building the Call no. by adding the Book No. or Author No. that consists of three initial letters of the surname of 	15

		<p>the author and a small letter of the first word (Except A, An and The of the title) of the title or three initial letters of the title itself in case of Title main entry card below the Class no. and adding the year of publication also below the Book no.</p> <ul style="list-style-type: none"> • Writing the Call no. by a pencil in the center of the back of the last page of the classified book. • Writing the Call no. without the year below the Book no. in the left corner of the catalog cards prepared for that book. • Some examples of Call nos.: <table border="0" style="margin-left: 40px;"> <thead> <tr> <th style="text-align: left;">S.N.</th> <th style="text-align: left;">Call no.</th> <th style="text-align: left;">Title/ Author</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>824</td> <td>High school essays / Sangpo Lama LAM-h 2010</td> </tr> <tr> <td>2.</td> <td>423</td> <td>Cambridge dictionary of American English CAM 2001</td> </tr> </tbody> </table> <ul style="list-style-type: none"> • After demonstration of classification of few books, the teacher will assign students with practical exercises first by providing a sheet containing list of about 10-15 titles of some simple books or by providing 10-15 books themselves in the classroom. The students assign Class no. for each title or book by using DDC under supervision and guidance of the teacher, who will check and correct their assignment. Students will do this classification work for about 20-30 books by using DDC and build Call nos. also for those books in the classroom itself because DDC is available only in classroom. 	S.N.	Call no.	Title/ Author	1.	824	High school essays / Sangpo Lama LAM-h 2010	2.	423	Cambridge dictionary of American English CAM 2001	
S.N.	Call no.	Title/ Author										
1.	824	High school essays / Sangpo Lama LAM-h 2010										
2.	423	Cambridge dictionary of American English CAM 2001										
3	Library Cataloguing and Subject Heading Assignment	<p>3. Library Cataloguing and Subject Heading Assignment</p> <ul style="list-style-type: none"> • The teacher demonstrates students how to catalog a book by using Anglo-American Cataloging Rules 2nd ed. (AACR2) and assign proper subject heading(s) by using Sears List of Subject Headings (SLSH). While cataloging a book, one needs to make at least 4/5 catalog cards for a book as follows: <ol style="list-style-type: none"> 1. Main card 2. Shelf list card 3. Added cards: i. Subject card and ii. Joint author or editor card. iii. Title card 	15									

		<ul style="list-style-type: none"> • A Main card contains following information about the book in the following sequence and places of a card: <ol style="list-style-type: none"> 1. Call no.: Written in the left corner of the card. 2. Heading section (Surname, Forename of the author): Starts from the 12th type space in the line of Book no. 3. Body [Title / author. – Edition. – Imprint (Place: Publisher, Year.)]: Starts from the 14th. type space and continues from the 12th. type space in the next line(s) 4. Collation [Pagination no.: ill., maps, tables. – (Series name; no.)]: Starts from the 14th. type space and continues from the 12th. type space. 5. Notes (Any important information not mentioned in the above sections): Starts from the 14th. type space and continues from the 12th. type space. 6. ISBN (International Standard Book Number): Starts from the 14th. type space. 7. Tracing section (Statement of additional cards such as 1. Subject heading. 2. Subject heading. I. Joint author's name or Editor's name. II. Title. III. Series.): Starts from the 14th. type space and continues from the 12th. type space. <p>Example of a Main card:</p> <div style="border: 1px solid black; padding: 5px;"> <p>824 LAM-h Lama, Sangpo High school essays/Sangpo Lama, edited by Sangpo Lama. - Kathmandu : Ekta Books, 2010. 224 p. ISBN 978 – 9937 – 1 – 0075 – 5 ○ 1. English essays. I. Lama, Sangpo, ed. II. Title.</p> </div> 	
		<ul style="list-style-type: none"> • In the above Main card, all the information from Heading section to ISBN are taken from various parts of the book specially from the main title page. But the subject heading: English essays are selected from the SLSH for reflecting the main subject of the book. For this work, the cataloger first should determine the main subject of the book as done for classification work. Then he/she should turn out the pages of SLSH for selecting the proper subject heading that reflects that subject. <p>On the basis of the above Main card, other four cards are made. They are:</p> <ol style="list-style-type: none"> 1. Shelf list card by adding the Accession no. 2456 in the left side in the line of pagination, 	

Example of Shelf list card	
824 LAM-h	<p>Lama, Sangpo High school essays/Sangpo Lama, edited by Sangpo Lama. - Kathmandu : Ekta Books, 2010. 224 p. ISBN 978 – 9937 – 1 – 0075 – 5</p> <p>1. English essays. I. Lama, Sangpo, ed. II. Title.</p>
<p>2. Subject card by adding the Subject heading in Capital letter: ENGLISH ESSAYS just above the Heading section starting from the 14th type space,</p> <p style="text-align: center;">Example of a Subject card</p>	
824 LAM-h	<p style="text-align: center;">ENGLISH ESSAYS</p> <p>Lama, Sangpo High school essays/Sangpo Lama, edited by Sangpo Lama. - Kathmandu : Ekta Books, 2010. 224 p. ISBN 978 – 9937 – 1 – 0075 – 5</p>
<p>3. Editor card by adding Lama, Sangpo, ed. just above the Heading section starting from the 14th type space,</p> <p style="text-align: center;">Example of a Editor card</p>	
824 LAM-h	<p style="text-align: center;">Lama, Sangpo, ed.</p> <p>Lama, Sangpo High school essays/Sangpo Lama, edited by Sangpo Lama. - Kathmandu : Ekta Books, 2010. 224 p. ISBN 978 – 9937 – 1 – 0075 – 5</p>
<p>4. Title card by adding the title: High school essays just above the Heading section starting from the 14th type space.</p> <p style="text-align: center;">Example of Title card</p>	
824 LAM-h	<p style="text-align: center;">High school essays</p> <p>Lama, Sangpo High school essays/Sangpo Lama, edited by Sangpo Lama. - Kathmandu : Ekta Books, 2010. 224 p. ISBN 978 – 9937 – 1 – 0075 – 5</p>
<ul style="list-style-type: none"> • If there are two or three authors, the Main card is made by the name of the first author and the other two or three 	

		<p>authors' names are written in the body. Then one or two added cards are made for one or two joint authors.</p> <ul style="list-style-type: none"> • If there are more than three authors, then the main card is made under the Title main entry by writing the name of the first author and "and others' in the body. Then an added card is made for that first author. • If there is no author, then Main card is made under title. • After demonstration, the teacher assigns practical exercises to each student for doing cataloging of about 15/20 books of different subjects by single as well as multiple authors. Then the teacher checks and corrects the catalogs submitted by the students and provides necessary suggestions to the students for making them more confident. 	
4	End Processing and Book Shelving	<p>4.End Processing and Book Shelving</p> <p>The teacher demonstrates various works to be done in the end processing of a book, that is already classified and cataloged and whose catalogs are already typed on the basis of piece slip, such as:</p> <ul style="list-style-type: none"> • Checking of Accession no. and Call no. written in the book and of the set of typed catalog cards and correction of mistake if there is. • Checking of ownership stamp to be stamped in verso of the main title page and in the clue page. • Checking of Call no. and Accession no. written or typed in the book pocket and book card in their left corners and right corners respectively and author's name and title in the center as provided there. • Checking of due date slip on whose right corner the Accession no. is written. • Pasting of the book pocket, in which book card is inserted, in the center of the back of the back cover of the book at the bottom. • Pasting of the due date slip on the top of the back of the last page of the book • Checking of Call no. written or typed in the book label and pasting it in the spine of the book one inch above the bottom line or in the front face of the front cover leaving at least one centimeter space from the left margin and one inch above the bottom if the spine of the book is too thin. <p>Then, the teacher asks the students to do all the end processing works of all those books which they have classified and</p>	3

		<p>cataloged in the previous practical classes. The teacher supervises and checks works of all students and corrects if there is any mistake in their work.</p> <p>After that, the teacher teaches the students how to file catalog cards in two different sequences: i. Shelf list catalog according to Call no. in ascending order and ii. Public catalog in dictionary order word by word such as A, B, C, D.....Z .</p> <p>Accordingly, each student file the catalog cards, that they have prepared for those 15/20 books, in two different sequences i. Shelf list catalog and ii. Public catalog under the supervision of the teacher.</p> <p>Finally, the teacher asks the students to sort out their processed books in two different language groups: i. English and ii. Nepali. Then, he/she helps the students to shelve each language books in two different sequences: i. Reference collection and ii. General collection according to their Call nos. in ascending order from left to right in the shelves</p>	
5	Circulation System	<p>5.Circulation System</p> <p>The teacher can demonstrate various works to be done in a Circulation Section of a library either by taking the students in the Library of their own school or creating a small temporary library that houses some volumes of books which they have processed during previous practical classes in the classroom itself. They are as follows:</p> <ul style="list-style-type: none"> • Membership card Issue to the user after collecting the properly filled up membership form with basic information about the user: Full name, Address, Class or Occupation, School/College or Office, Phone no., Email, Signature and date, etc, • Arrangement for a property counter and daily users' attendance register, • Library orientation for introducing users with various sections and the staff, and informing about the available resources or collection, services, facilities, information and communication technology facilities, programs, activities, rules and regulations of the library, • Book issue and return or charging and discharging work by following Browne system that needs one card for one book or by using Barcode charging and discharging system, • Arrangement for book renew and reservation, calculation of overdue and fine and sending reminder in time, 	4

	<ul style="list-style-type: none"> • Stack reading and shelving of used books, • Compilation of daily statistics of all work done in this section. <p>After demonstration of above works, students are asked to do above works either in the Circulation Section of the Library of their own school or in the classroom as described above under supervision and guidance of the teacher so that they can learn practical knowledge and skill in this section</p>	
--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

Necessary tools, stationeries, equipment, etc. for practical work are:

1. Book selection tools such as publishers' catalogs, booksellers' book lists, printed catalog of big libraries, NNB, Union catalog, printed bibliographies, etc.
2. DDC School edition or few volumes of DDC set, AACR – 2, SLSH, dictionaries, etc. depending upon the no. of students
3. Computer and circulation software, barcode card, barcode scanner/ barcode reader
4. Internet facilities
5. Accession register or Accession register sheet
6. Catalog cards, book pockets, book cards, due date slips, book labels, membership cards, guide cards, ownership stamp, due date stamp, etc.
7. Card cabinet for card filling if possible, book supports, book card trays
8. Writing papers, pens, pencils, rubbers, pencil cutters, scales, etc.
9. Stapler machine and pins, punching machine, clips, stamp, ink pad, etc.

Grade 12 Internship

40 Hours

1. Visit a library to collect the following information, prepare a report and submit it.
 - a. Book selection, acquisition and accessioning
 - b. Technical processing: classifying, cataloguing, subject heading/keyword assigning, card preparing
 - c. Data entry and editing in database
 - d. End processing and book shelving
 - e. Performing circulation work
 - f. Providing information search and retrieval service
 - g. Providing reference services using different tools
 - h. Periodical selection, acquisition, recording, displaying and filling/shelving
 - i. Recording various methods of preservation and conservation, etc.
 - j. Compilation of statistics of all work done

Every student should conduct the above activities to complete internship project on the basis of given plan format.

Intern Performance Evaluation

Intern name _____ Intern ID number _____

Internship site _____ Total hours _____

Supervisor _____ Semester _____

Internship Task Plan	Total Hours/ Period	Hours completed
Accessioning		
Classification		
Cataloguing		
Circulation		
Data entry / OPAC		
Information search and retrieval service		
Reference services using different tools		
Periodical selection, acquisition, recording, displaying and filling/shelving		
Preservation and conservation activities		
Compilation of statistics & Preparing annual report		

7. Learning Facilitation Method and Process

Learning facilitation process is the crux of the teaching and learning activity. One topic can be facilitated through two or more than two methods or processes. The degree of usage will be based on the nature of the content to be facilitated. Some processes are teacher centered, some are student centered and some are the mix of both. The conceptual and philosophical types of content can be based on lecture method. Even the philosophical and theoretical contents also can be facilitated using inductive methods in the beginning and can deliver the lecture based on the response of the students.

The following facilitation methods, techniques and strategies will be applied while conducting the teaching learning process:

- Classroom lectures,
- Group discussion and presentation,
- Case studies
- Home assignment;
- Library visits and surveys
- Project Work
- Brochure, booklet, magazine and newspapers related to library and information

science of various public and community libraries as well as academic and other type of libraries

- Use of audio-visual aids like pictures and documentary
- Various questionnaire and reports related to library and information science
- Information and Communication Technology Tools such as computers and multi-media projector and Online Resources etc.

8. Student Evaluation

Evaluation is an integral part of learning process. Both formative and summative modes of evaluation are emphasized. Formative evaluation will be conducted so as to provide regular feedback for students, teachers and parents/guardians about how student learning is. Class tests, unit tests, oral question-answer, home assignment etc. are some ways of formative evaluation.

There will be separate evaluation of theoretical and practical learning. Summative evaluation embraces theoretical examination, practical examination and evaluation of project work activities.

a. Internal Evaluation

Internal evaluation covers 25 Percent weightage. Internal evaluation consists of (a) Practical work/Internship (16 marks), (b) Marks from trimester examinations (6 marks), and (c) Classroom participation (3 marks). Mark distribution for these areas of internal evaluation will be as given in the table:

Grade- 11

SN	Areas of Internal Evaluation	Evaluation criteria	Marks
1.	Practical/experimental and project works	Selection, acquisition, accessioning methods	2
		Classification	5
		Cataloguing (Author entry up to three authors, title entry)	5
		End processing, card filing and book shelving	2
		Circulation system and shelving	2
2	Classroom participation	Participation (Classroom and project work/practical activities)	3
7	Trimester test	First and Second Trimester: 3/3 marks	6
		Total	25

Grade 12

Internal evaluation for grade 12 will be based on Internship. Students should work 40 hours in an assigned library. Students will be evaluated at two different levels. Total marks will be 25. Out of 25 marks 5 (20%) marks will be given by the internal supervisor from the cooperating library. Class teacher/supervisor will assign 20 (80%).

Internship Activities, Participation and Test

S.N	Criteria	Indicators	Excellent	Very Good	Satisfactory	Unsatisfactory
1	Internship Activities	Quality and quantity of work	2	1.5	1	0.5
		Knowledge of policy and procedures, Initiative and resourcefulness	2	1.5	1	0.5
		Ability to follow directions and ask questions	2	1.5	1	0.5
		Attendance and Reliability	2	1.5	1	0.5
		Attitude/personal conduct at work	2	1.5	1	0.5
		Interaction with office personnel	2	1.5	1	0.5
		Attitude/personal conduct to user	2	1.5	1	0.5
		Overall performance	2	1.5	1	0.5
		Total Marks	16			
2	Participation	Participation on Classroom and Project Work/Practical activities	3			
3	Test	First and Second Trimester (3+3)	6			
Grand Total			25			

b. External Evaluation

External evaluation covers 75 Percent weightage. The tool for external evaluation of theoretical learning will be a written examination. Questions for the external examination will be based on the specification grid developed by Curriculum Development Centre. Examination question paper will be developed using various levels of revised Bloom's taxonomy including remembering level, understanding level, application level and higher ability (analyzing, evaluating, and creating).

Home Science

Grade: 11 and 12

**Subject code: Hos.411(Grade 11),
Hos.412(Grade 12)**

Credit Hours: 5

Annual working hours: 160

1. Introduction

Home science as a subject is a well-expanded discipline which integrates the application of various sciences and humanities to improve human environment, family nutrition, management of resources and child development. It's an 'art' as it helps to manage resources in a skillful manner, and also a 'science' that it helps to improve family life by offering knowledge in the field. Home Science curriculum is introduced to provide knowledge and skill to the students to identify themselves in their own family, community and nation through identifying their roles, responsibilities and resources.

The first part of curriculum includes human nutrition which aims to develop knowledge and skill on nutrition particularly nutrients, functions of food, digestion, absorption of dietary nutrients, nutritional deficiency problems, balanced diet, food pyramid, meal planning on the basis of locally available food sources. The second part deals with child development which aims to develop proper knowledge and skills for healthy and happy childhood by promoting breast feeding, immunization and so on. Home management as a third part will equip students the effective management of various resources for the well-being of the family. Moreover, the fourth part textile and fashion designing imparts knowledge and skills on textile fibers, classification of fibers, weaving, dyeing and printing, fashion, important body measurements, basic and decorative stitching, and body sketching etc.

The curriculum has been offered as per the structure of National Curriculum Framework. It provides a comprehensive outline of level-wise competencies, grade-wise learning outcomes and scope and sequence of contents, suggested practical/project activities, learning facilitation process and assessment strategies so as to enhance the learning on the subject systematic.

2. Level-wise Competencies

After studying Home Science in Grade 11 and 12, the students will develop the following competencies:

1. Explain the concept, relevance, significance and discipline of home science.
2. Identify the area of specialization in home science and career opportunity in the subject.
3. Explain the functions, objectives and importance of nutrition, balanced diet and six food groups.
4. Describe the classification, chemical composition, functions, sources, daily requirements of nutrients at different age and major deficiency symptoms of macro- and micro nutrients.
5. Demonstrate and describe food safety and hygiene, food preservation, food spoilage and methods of food preservation.
6. Explain the structure and function of human reproductive system and discuss the reproductive process and causes of high infant mortality in Nepal.
7. Describe importance and value of breast feeding and day care or preschool for welfare of child and working mother.

8. Describe importance of common childhood problems and providing safety for common accidents.
9. Describe early childhood development criteria and need of society and family for holistic development process.
10. Describe the major aspects of the home and basic family economics, decision making and the need of consumer.
11. Distinguish human and non-human resources properly.
12. Understand the household physics and principle of working electric appliances.
13. Identify the concept of interior decoration and arrangement
14. Identify the income generating activities
15. Explain and identify different types of fibers, weaving, decorative stitches their properties, sketching and stitching of costumes and its theories
16. Identify and select appropriate fabric for various purposes and also the terminologies used in clothing and fashion designing
17. Explain about the use of dyeing and apply stain removed method

3. Grade-wise Learning Outcomes

S.N.	Subject Area	Class 11	Class 12
1	Human Nutrition	1.1 Home Science: A Multidisciplinary Subject 1.1.1 Explain the concept of home science 1.1.2 Explain the relevance and significance of home science 1.1.3 Demonstrate the understanding of different disciplines of home science 1.1.4 Identify the area of specialization and career opportunity in home science	1.1 Nutritional Requirements and Food Habits 1.1.1 Define nutritional requirements 1.1.2 Explain the food habits of different age groups 1.1.3 Explain nutritional requirements for groups with special needs
		1.2 Human Nutrition and Nutrients 1.2.1 Define foods and nutrition 1.2.2 Explain the classification and functions of the food 1.2.3 Identify the importance of food and nutrition in human health	1.2 Digestion, Absorption and Utilization Mechanism of Food in Human Body 1.2.1 Describe the digestion mechanism of foods in human body 1.2.2 Understand the absorption and utilization of foods inside the human body

		<p>1.2.4 Define the nutrients</p> <p>1.2.5 Classify the nutrients</p> <p>1.2.6 Describe the sources, functions, and daily requirements of macro and micro nutrients for different age group</p> <p>1.2.7 Explain the major deficiency of carbohydrate, protein, fat, vitamins and minerals</p>	
		<p>1.3 Basic Six Food Group and Balanced Diet</p> <p>1.3.1 Identify the sources of six basic food groups according to their nutritive values</p> <p>1.3.2 Define the balanced diet</p> <p>1.3.3 Describe the objective and principle of balanced diet</p> <p>1.3.4 Identify the My Food Pyramid and Plate Methods in formulation of diet</p>	<p>1.3 Meal Planning and Cooking of Foods</p> <p>1.3.1 Explain meal planning</p> <p>1.3.2 Explain the principles and importance of planning meal for family benefit</p> <p>1.3.3 State the reasons for cooking foods</p> <p>1.3.4 Describe different cooking methods</p> <p>1.3.5 Describe the changes in nutrients, texture and taste by cooking methods</p>
		<p>1.4 Food preservation</p> <p>1.4.1 Define food spoilage and food preservation</p> <p>1.4.2 Identify the causes of food spoilage</p> <p>1.4.3 Explain principles and methods of food preservation</p>	<p>1.4 Food Safety and Hygiene</p> <p>1.4.1 Describe the role of microorganisms in food safety</p> <p>1.4.2 Describe the process of food contamination and its effects on human health</p> <p>1.4.3 Explain the food sanitation and food hygiene for nutritious food eating practice</p> <p>1.4.4 Explain the importance of personal hygiene in maintaining food safety</p>
2	Child development	<p>2.1 Introduction and Stages of Child Development and Reproductive System</p> <p>2.1.1 Explain the concept of child development</p> <p>2.1.2 Describe the Developmental</p>	<p>2.1 Play and its Importance in Childhood</p> <p>2.1.1 Describe Need and importance of play during childhood, learning through play</p> <p>2.1.2 Explain Physical, motor, social and</p>

	<p>milestone of child development</p> <p>2.1.3 Describe the concept of reproductive health</p> <p>2.1.4 Describe male and female reproductive organs</p> <p>2.1.5 Explain the menstruation cycle</p> <p>2.1.6 Maintain hygiene during the period of menstruation</p> <p>2.1.7 Explain conception and fertilization process of human beings</p>	<p>intellectual development through play</p> <p>2.1.3 Demonstrate the selection of toys for child according to age(safety, quality, feature, color, materials)</p>
	<p>2.2 Prenatal and Postnatal Care</p> <p>2.2.1 Explain the need and importance of prenatal and postnatal care (diet, rest and health care)</p> <p>2.2.2 Describe adjustment of a new born baby</p> <p>2.2.3 Explain the care of new born baby during infection and other disease</p> <p>2.2.4 Explain the importance of sleep, rest and play for baby up to one year</p> <p>2.2.5 Identify proper clothing material for the baby</p> <p>2.2.6 Explain the importance of day care/preschool for the welfare of child and working mother</p>	<p>2.2 Concept of Growth and Development</p> <p>2.2.1 Explain the Principles of growth and development</p> <p>2.2.2 Describe influencing factors- heredity, environment and individual factors of child growth and development</p> <p>2.2.3 Explain factors affecting child development</p>
	<p>2.3 Breast Feeding and Complementary Feeding</p> <p>2.3.1 Explain the importance and value of breast feeding, colostrum feeding, exclusive breast feeding</p> <p>2.3.2 Identify cultural practices about breast feeding in Nepal</p> <p>2.3.3 Explain the disadvantages of</p>	<p>2.3 Early Childhood Development</p> <p>2.3.1 Explain importance of early childhood development and Age specific milestones</p> <p>2.3.2 Describe domains of early childhood development</p> <p>2.3.3 Explain the holistic approach in early childhood development</p>

		<p>bottle/formula feeding</p> <p>2.3.4 Explain the need, importance and problems of weaning</p> <p>2.3.5 Describe the complementary food for the baby</p>	
		<p>2.4 Infant Mortality, Common Ailments of Childhood and Common Accidents among Child inside Home and outside Home</p> <p>2.4.1 Explain the existing situation and causes of infant mortality and also explain the ways of reducing high infant mortality in Nepal</p> <p>2.4.2 Describe common ailments of childhood- diarrhea, dehydration and use of Oral Rehydration Solution (ORS), bronchitis and tonsillitis and pneumonia- symptoms and care</p> <p>2.4.3 Demonstrate the process of ORS</p> <p>2.4.4 Explain common childhood problems such as bed wetting, nail biting, toilet training and thumb sucking etc.</p> <p>2.4.5 Describe methods of preventing and controlling childhood problems</p> <p>2.4.6 Explain about common accidents among child and describe simple methods of prevention of common accidents</p>	<p>2.4 Adolescence and Family</p> <p>2.4.1 Describe developmental changes during adolescence</p> <p>2.4.2 Explain about influences of peers, family, media and society on adolescences</p> <p>2.4.3 Describe about adjustment and preparedness during adolescents</p> <p>2.4.4 Explain hazards of adolescence</p> <p>2.4.5 Describe family as a social unit</p> <p>2.4.6 Explain changing structure of the family (Joint and single family) and its impact on children</p> <p>2.4.7 Explain need for happy relationships within the family and role of all members</p> <p>2.4.8 Describe about caring and respecting elders</p>

3	Home management	3.1 Home Management 3.1.1 Describe concept and principle of home management 3.1.2 Determine decision making and managerial responsibilities 3.1.3 Identify the roles and responsibilities, qualities and characteristics of a home maker 3.1.4 Explain the function and characteristics of a good home	3.1 Money Management 3.1.1 Define types of family income 3.1.2 Identify the need and the components of family budget 3.1.3 Prepare family budget 3.1.4 Identify method of saving and investment
		3.2 Maintenance and Care of Home 3.2.1 Discuss on need of cleaning and caring home 3.2.2 Define cleaning equipments and cleaning materials 3.2.3 Carry out cleaning, caring and polishing of different household articles, floor and wall 3.2.4 Control household pests and rodents	3.2 Resource Management 3.2.1 Describe human and nonhuman resources 3.2.2 Make schedule of different household activities 3.2.3 Apply time and work simplification in home management
		3.3 Family Income 3.3.1 Describe various sources of family income 3.3.2 Identify consumer's right and responsibilities 3.3.3 Determine the role of women in family economics	3.3 Interior Decoration 3.3.1 Identify importance and principle of art in interior decoration 3.3.2 Arrange furniture and curtain in different rooms 3.3.3 Arrange flower in various method 3.3.4 Identify other accessories in home decoration

		<p>3.4 Applied Physics</p> <p>3.4.1 Explain the importance of household physics</p> <p>3.4.2 Describe the modes of the transmission of heat</p> <p>3.4.3 Identify good/bad conductors of heat</p> <p>3.4.4 Operate household electric appliances</p>	<p>3.4 Income Generating Activities</p> <p>3.4.1 Identify suitable small scale income generating activities</p> <p>3.4.2 Plan of organic kitchen garden/ KaushiKheti (roof farming),</p> <p>3.4.3 Demonstrate the process of making compost manure</p> <p>3.4.4 Demonstrate poultry / livestock rearing practices</p>
4	Clothing and fashion designing	<p>4.1 Classification of Fibers and their Properties</p> <p>4.1.1 Define properties of textile fibers</p> <p>4.1.2 Understand types of fiber and their properties</p> <p>4.1.3 Classify the fibers</p>	<p>4.1 Costume Development Theories</p> <p>4.1.1 Explain costume development theories such as, environmental adoption theory, shyness theory, opposite sex attraction theory and adornment theory</p>
		<p>4.2 Weaving</p> <p>4.2.1 Define weaving - felting, knotting, broiding, lace</p> <p>4.2.2 Describe differences between knitting and weaving</p> <p>4.2.3 Explain types of weaving</p>	<p>4.2 Fashion and design</p> <p>4.2.1 Describe about fashion and design</p> <p>4.2.2 Explain the components of beautiful dress – balance, rhythm, harmony and proportion</p>
		<p>4.3 Fabric Selection and Sketching a Human Figure</p> <p>4.3.1 Explain the points while fabric selection -economic condition of family, purpose of the costume, social and culture status of family, age and sex, design and comfort</p> <p>4.3.2 Select color, design and texture of clothing material according to season, occasion, time, fashion, age and body structure</p> <p>4.3.3 Select clothing for various</p>	<p>4.3 Dyeing, Printing and Stain Remove</p> <p>4.3.1 Explain about dyeing and its types</p> <p>4.3.2 Apply various dyeing process like raw stock dyeing, Piece dyeing, skein dyeing, tie and dye, cross dye and batik</p> <p>4.3.3 Describe and apply different printing methods</p> <p>4.3.4 Understand various stains removing processes</p> <p>4.3.5 Apply various process of stain removing in clothes</p>

		activity - school/campus,sport, party, office, causal 4.3.4 Sketch a human figure	
		4.4 Terminologies Used in Clothing and Fashion Designing 4.4.1 Understand common terminologies used in clothing and fashion designing 4.4.2 Demonstrate and apply the sample of bias, selvedge, warp, weft, clip, slash, lay out, notches, fringe, gather, seams, pleats and placket opening in prepared cloth (Dress- top) 4.4.3 Understand pre-preparation of clothing construction- Measure different parts of the body, Prepare accurate pattern and model pattern and Lay out of pattern	4.4 Body Measurements and Decorative Stitches 4.4.1 Understand the proper way of body measurements 4.4.2 Demonstrate the direct measurement– full length, shoulder , sleeve length, chest , waist, hip, across back, inside length and arm hole; and Indirect measurement – In neck 4.4.3 Apply decorative stitches - sateen, chain, cross, herring bone, fly, feather, double knot, and stem while constructing clothes

4. Scope and Sequence of Contents

unit	subject area	class 11		class 12	
			Hrs		Hrs
1	Humam nutrition	1.1 Home Science A Multidisciplinary Subject 1.1.1 Introduction, meaning and concept of home science, 1.1.2 Relevance and significance of home science in human life 1.1.3 Introduction to four discipline of home science 1.1.3.1 Human nutrition	5	1.1 Nutritional Requirements and Food Habits 1.1.1 Introduction of nutritional requirements 1.1.2 Food habits of weaning child, school going children, teen agers and elderly peoples 1.1.2 Nutritional requirements and food habit for special need groups-pregnant and	8

		<p>1.1.3.2 Child Development/Human Development</p> <p>1.1.3.3 Home/Resource management</p> <p>1.1.3.4 Clothing and fashion designing</p> <p>1.1.4 Career opportunity in home science:</p> <p>1.1.5 Difference between Wage employment and Self-employment in different areas of home science</p>		lactating mothers	
		<p>1.2 Human Nutrition and Nutrients</p> <p>1.2.1 Introduction to food and nutrition</p> <p>1.2.2 Definition and history of food and Nutrition</p> <p>1.2.3 Classification and function of food</p> <p>1.2.4 Importance of food and nutrition in human health</p> <p>1.2.5 Classification of nutrients:</p> <p> 1.2.5.1 Macro nutrients</p> <p> 1.2.5.2 Micro nutrients</p> <p>1.2.6 Deficiency symptoms of nutrients</p> <p>1.2.7 Body need of different Nutrients in life span period:</p> <p> 1.2.7.1 Infant, toddler, children, adolescent, adult, old age</p>	10	<p>1.2 Digestion, Absorption and Utilization Mechanism of Food in Human Body</p> <p>1.2.1 Food digestion mechanism in different organ of the human body: mouth, stomach, duodenum and small intestine</p> <p>1.2.2 Absorption and utilization of nutrients inside the human body</p>	5

		<p>1.3 Basic Six Food Group and Balanced Diet</p> <p>1.3.1 Definition of basic six food group</p> <p>1.3.2 Importance and objectives of balanced diet for a healthy life</p> <p>1.3.3 Concept and use of My Food Pyramid and Plate Method</p> <p>1.3.4 Recommended serving size in My Food Pyramid and Plate Method</p> <p>1.3.5 Dietary guidelines and principles of balanced diet</p>	10	<p>1.3 Meal Planning and Cooking of Foods</p> <p>1.3.1 Introduction and concept of meal planning</p> <p>1.3.2 Principles and importance of meal planning for healthy eating</p> <p>1.3.3 Reasons for cooking foods.</p> <p>1.3.4 Different methods of cooking- boiling, stewing, frying, grilling, baking</p> <p>1.3.5 Changes in nutrients, texture and taste of food by different cooking methods</p>	8
		<p>1.4 Food Preservation</p> <p>1.4.1 Introduction to food preservation</p> <p>1.4.2 Effects on nutritive value of food by processing and preservation process</p> <p>1.4.3 Major causes and types of food spoilage</p> <p>1.4.4 Means of preservation: pickling, drying, smoking, salting</p>	5	<p>1.4 Food Safety and Hygiene</p> <p>1.4.1 Role of microorganisms in food, safety (biological, chemical, physical)</p> <p>1.4.2 Process of food contamination and its effects on human health</p> <p>1.4.3 Food sanitation and food hygiene-personal hygiene, food hygiene of milk and milk products, meat and vegetables</p>	9

2	Child Development	<p>2.1 Introduction and Stages of Child Development and Reproductive System</p> <p>2.1.1 Introduction to child development</p> <p>2.1.2 Developmental milestone of child development from (prenatal stage to 8 years)</p> <p>2.1.3 Introduction and concept of reproduction health</p> <p>2.1.4 Reproductive system- male and female reproductive organs</p> <p>2.1.5 Menstruation cycle, maintenance of health and hygiene during menstruation period</p> <p>2.1.6 Conception and fertilization</p>	7	<p>2.1 Play and Its Importance in Childhood</p> <p>2.1.1 Need and importance of play during childhood, learning through play</p> <p>2.1.2 Physical, motor, social and intellectual development through play</p> <p>2.1.3 Selection of toys for child according to age (safety, quality, feature, color, materials)</p>	8
		<p>2.2 Prenatal and Postnatal Care</p> <p>2.2.1 Need and importance of prenatal and postnatal care (diet, rest and health care)</p> <p>2.2.2 Adjustment of a new born baby, and care of new born baby (immunization against infectious and other disease)</p> <p>2.2.3 Importance of sleep, rest and play for baby up to one year and selection of clothes for the baby</p> <p>2.2.4 Importance of day care /preschool for welfare of child and working mother</p>	8	<p>2.2 Concept of Growth and Development</p> <p>2.2.1 Principles of growth and development: difference between growth and development</p> <p>2.2.2 Influencing factors of growth and development-heredity, environment and individual differences</p> <p>2.2.3 Factors affecting child development (physical and physiological factors ,socio-economic status of family, parental education, household workload, nutritional intake, child's expectations & needs, Sense of</p>	5

				security, parental treatment of children by gender)	
		<p>2.3 Breast Feeding and Complementary Feeding</p> <p>2.3.1 Importance and value of breast feeding and colostrum feeding, exclusive breast feeding</p> <p>2.3.2 Cultural practices about breast feeding in Nepal, disadvantages of bottle feeding</p> <p>2.3.3 Need, Importance and problems of weaning</p> <p>2.3.4 Complementary food for the baby</p>	5	<p>2.3 Early Childhood Development (ECD)</p> <p>2.3.1 Importance of Early Childhood Development (ECD) and age specific milestones</p> <p>2.3.2 Domains of early childhood development- physical-motor, cognitive, emotional, social language</p> <p>2.3.3 Holistic approach to promote optimal development of children</p>	6
		<p>2.4 Infant mortality, Common Ailments of Childhood and Common Accidents among Child Inside Home and Outside Home</p> <p>2.4.1 Infant mortality in Nepal, causes of high infant mortality (existing situation), reducing high mortality rate and fertility rate -birth control (male and female)</p> <p>2.4.2 Diarrhea , dehydration and use of Oral Rehydration Solution (ORS), measles, bronchitis and tonsillitis and pneumonia- symptoms and care</p> <p>2.4.3 Common childhood problems such as bed wetting nail biting and thumb sucking etc.</p>	10	<p>2.4 Adolescence and Family</p> <p>2.4 Developmental changes during adolescence: physical, social, emotional and cognitive</p> <p>2.4.1 Influencing factors on adolescence-peers, family, society, adults and media</p> <p>2.4.2 Adjustment and preparedness during adolescence, readiness for adulthood and building positive relationships,</p> <p>2.4.3 Family as a social unit- functions and importance</p> <p>2.4.4 Changing structure of the family- extended, joint and nuclear family and its impact on children</p> <p>2.4.5 Need for happy relationships within the</p>	11

		2.4.4 Method to prevent and control these problem and guidance to parents about handling these problems		family and role of all members 2.4.6 Value of elders and caring and respecting elders- Senior citizens	
3	Home Management	3.1 Home Management 3.1.1 Concept and principle of home management 3.1.2 Process of decision making and managerial responsibilities 3.1.3 Roles and responsibilities, qualities and characteristics of a home maker 3.1.4 Function and characteristics of a good home; water supply, sanitation, ventilation	6	3.1 Money Management 3.1.1 Family budget - types of family budget, planning, estimate, advantage and limitation of the family budget 3.1.2 Saving- meaning and importance of saving, types, and methods of investment: risk, security, profit tax saving 3.1.3 Investment- bank scheme (saving, fixed, current), insurance scheme- whole life, senior citizen scheme	8
		3.2 Maintenance and Care of Home 3.2.1 Need of cleaning and caring home 3.2.2 Cleaning household metal and non metal equipments and cleaning materials 3.2.3 Caring and polishing of different types of household appliances 3.2.4 Control measures of household pests and rodents and insects	12	3.2 Resource Management 3.2.1 Family resources (human, non-human), factors affecting the use of resources, maximizing the use of resources 3.2.2 Time management- daily, weekly seasonal tasks and activities plans, tools in time management; peak load, work load, rest periods 3.2.3 Work simplification- importance, factors influence the character of work: change in body position, motions, working arrangements and equipment, change in production sequence, finished product and	8

				raw materials	
		<p>3.3 Family Income</p> <p>3.3.1 Various sources of family income: money income, real income, psychic income</p> <p>3.3.2 Consumer education- Meaning, consumer's right and responsibilities, consumer protection, food legislation in Nepal.</p> <p>3.3.3 Role of women in family economics, tips on control wastages</p>	6	<p>3.3 Interior Decoration</p> <p>3.3.1 Introduction to interior decoration- principle, elements and objectives, characteristics of colour, colour scheme, use of colour in interior decoration</p> <p>3.3.2 Furniture and curtain arrangement- selection of furniture and curtain ,arrangement of furniture and curtain- color, utility, scale, rhythm, harmony, emphasis and comfort</p> <p>3.3.3 Flower arrangement- elements of art, principle, design and types of flower arrangement, equipments needed for flower arrangement</p>	10
		<p>3.4 Applied Physics</p> <p>3.4.1 Importance of household physics-force, work, power, energy, volume ,weight</p> <p>3.4.2 Heat and temperature- transmission of heat, use of bad conductors, lighting</p> <p>3.4.3 Principle of working household appliances (electric)-refrigerator, iron, kettle, heater, electric oven, water heater , rice cooker, air condition, fan, induction heater, solar equipments, bio-gas</p> <p>3.4.4 Household electric safety</p>	6	<p>3.4 Income Generating Activities</p> <p>3.4.1 Importance and need of income generating activities for family</p> <p>3.4.2 Kitchen garden (organic) / kaushikhethi (roof farming) - introduction, importance, advantages, various types of vegetables (winter/ summer), method of growing vegetables, growing flowers, diseases and treatment of some garden plants, different equipments used in field</p> <p>3.4.3 Poultry</p>	4

		measures		keeping/livestock-Importance, methods of keeping poultry, diseases and treatment 3.4.4 Farm manure- compost manure, green manure, vermicelli manure	
4	Clothing and Fashion Designing	4.1 Classification of Fibers and Their Properties 4.1.1 Definition and properties of textile fibers 4.1.2 Types of fiber 4.1.2.1 Natural fibers: vegetable fibers- cotton, linen, hemp, Jute 4.1.2.2 Animal fibers – wool, silk 4.1.2.3 Artificial or man made fibers- rayon, nylon, dacron	5	4.1 Costume Development Theories 4.1.1 Custom development theories: 4.1.1.1 Environmental adoption theory 4.1.1.2 Shyness theory 4.1.1.3 Opposite sex attraction theory 4.1.1.4 Adornment theory	6
^		4.2 Weaving 4.2.1 Definition and types of weaving 4.2.1.1 Felting, knotting, broiding, lace 4.2.1.2 Weaving -i) Knitting ii) Weave 4.2.2 Type of weaves: 4.2.2.1 Plain weav- basket weave, rib weave 4.2.2.2 Twill weave 4.2.2.3 Satin weave – Satin weave, sateen weave 4.2.2.4 Other weaves- Jacquard weave, swivel weave, leno/gauge weave, pile weave	10	4.2 Fashion and Design 4.2.1 Definition of fashion 4.2.2 Costume and design 4.2.3 Components of beautiful dress: 4.2.3.1 Balance 4.2.3.2 Rhythm 4.2.3.3 Harmony 4.2.3.4 Proportion	9

		<p>4.3 Fabric Selection and Sketching a Human Figure</p> <p>4.3.1 Points should be considered while fabric selection:</p> <p>4.3.1.1 Economic condition of family</p> <p>4.3.1.2 Purpose of the costume</p> <p>4.3.1.3 Social and culture status of family</p> <p>4.3.1.4 Age and sex</p> <p>4.3.1.5 Design</p> <p>4.3.1.6 Comfort</p> <p>4.3.2 Selection of color, design and texture of clothing material: Season, occasion, time, fashion, age, body structure</p> <p>4.3.3 Selection of clothing for various activity: school/campus, sport, party, office, casual</p> <p>4.3.4 Sketching a human figure</p>	10	<p>4.3 Dyeing, Printing and Stain Removal</p> <p>4.3.1 Dyeing and its types</p> <p>4.3.1.1 Natural dye; vegetable dye, animal dye, mineral dye</p> <p>4.3.1.2 Artificial dye; acid dye, basic dye</p> <p>4.3.2 Dyeing process; raw stock dyeing, piece dyeing, skein dyeing, tie and dye, cross dye, batik</p> <p>4.3.4 Printing; machine print, block print, screen print, potato print</p> <p>4.3.5 Stain remove and its process; dipping, steaming, sponging</p>	9
		<p>4.4 Terminologies Used in Clothing and Fashion Designing</p> <p>4.4.1 Common terminologies used in clothing and fashion designing: grain line, bias, selvedge, warp, weft, clip, slash, lay out, notches, fringe, gather, seams, pleats, placket opening</p> <p>4.4.2 Pre-preparation of clothing construction:</p> <p>4.4.2.1 Measurement of</p>	5	<p>4.4 Body Measurements and Decorative Stitches</p> <p>4.4.1 Body measurements</p> <p>4.4.1.1 Direct measurement – full length, shoulder, sleeve length, chest, waist, hip, across back, inside length and arm hole</p> <p>4.4.1.2 Indirect measurement – in neck</p> <p>4.4.2 Decorative stitches; sateen, chain, cross, herring bone, fly,</p>	6

		body 4.4.2.2 Paper pattern – Accurate pattern, Model pattern 4.4.2.3 Lay out of pattern		feather, double knot, and stem	
		Total	120		120

practical activities

Practical is integral part of Secondary Education Curriculum. It focuses more on skill development than knowledge building. It consists of project work, group work, presentation, observation, internship etc. This course will be evaluated through internal and external evaluation procedures. Out of the total 5 (five) credit hours 25 percent time will be allotted for practical activities and school, community and field based project works. Total of 40 hours has been designated to practical activities and will be carried out under the guidance and monitoring of teacher. Following are only sample practical activities, teacher can assign any relevant practical activity as per requirement.

Unit	Subject area	Activities			
		Class 11	Hrs	Class 12	Hrs
1	Nutrition	1.1 Home Science A Multidisciplinary Subject 1.1.1 Project work on poster making indicating career list of different home science subject in group and do presentation at class.	2	1.1 Nutritional Requirements and Food Habits 1.1.1 Student will Make a Chart on Nutritional Requirements of weaning foods for child of age 6 months to two year time period	2
		1.2 Human nutrition and the Nutrients 1.2.1 Identifying Food items with their respective available nutrients and grouping according to the predominant function with the collection of local food items 1.2.2 Field trip of local food and vegetable market survey on available foods and vegetables and submit report on observed and interview taken at the market regarding price, quality and seasonal availability of above items	4	1.2 Digestion, Absorption and Utilization Mechanism of Food in Human Body 1.2.1 Student will make a chart on digestive system of human beings labeling digestive functions of different foods in different organ	1

		<p>1.3 Basic six Food Group and Balanced Diet</p> <p>1.3.1 Student will Make Chart or poster on My Food Pyramid on the basis of its color bands and present in the classroom</p>	2	<p>1.3 Meal Planning and Cooking of Foods</p> <p>1.3.1 Demonstration of cooking methods at least one item for each method at food lab:</p> <ul style="list-style-type: none"> i. Boiling ii. Steaming iii. Deep frying iv. Shallow Frying v. Roasting and baking <p>1.3.2 Student will work on Meal planning for a family and submit the plan sheet.</p>	5
		<p>1.4 Food Preservation</p> <p>1.4.1 Demonstration of popular household food preservation method in the local context selecting suitable method according to the local environment/situation</p>	2	<p>1.4 Food Safety and Hygiene</p> <p>1.4.1 Practical Demonstration on personal and food Hygiene at food lab:</p> <ul style="list-style-type: none"> i. Hand washing, ii. Observational check on cloth, nail and hand hygiene iii. Vegetable washing iv. Meat hygiene v. Milk and milk product hygiene 	2
2	Child Development	<p>2.1 Introduction and Stages of Child Development and Reproductive System</p> <p>2.1.1 Sketching diagram of reproductive organs (male and female) and level name of all parts</p>	2	<p>2.1 Play in Childhood</p> <p>2.1.1 Preparation of low cost soft toys for young children</p>	2
		<p>2.2 Prenatal and Postnatal Care</p> <p>2.2.1 Interaction about infant mortality situation in Nepal</p>	2	<p>2.2 Concept of Growth and Development</p> <p>2.2.1 Arranging interaction class on growth and development</p>	2

		<p>2.3 Breast Feeding and Complementary Feeding</p> <p>2.3.1 Preparation of supplementary food for the baby- <i>Poshilo Lito</i> and <i>poshilo Jaulo</i></p>	4	<p>2.3 Early Childhood Development</p> <p>2.3.1 Arranging interaction class on holistic approach to promote optimal development of children.</p> <p>2.3.2 Visiting a preschool and prepare a report on physical, - motor, cognitive, emotional, social and language development of 3-5 years child (a girl and a boy)</p>	3
		<p>2.4 Infant Mortality, Common Ailments of Childhood and Common Accidents among Child Inside Home and Outside Home</p> <p>2.4.1 Observation of day care center/preschool and report writing</p>	2	<p>2.4 Adolescence and Family</p> <p>2.4.1 Arranging interaction class on positive attitude towards adolescence</p> <p>2.4.2 Presentation on importance of family</p> <p>2.4.3 Visiting elderly home/ old age care center and prepare a small report</p>	3
3	Home Management	<p>3.1 Management in Home</p> <p>3.1.1 Chart or poster presentation on qualities and characteristics of good home maker</p> <p>3.1.2 Making of different room plan</p>	2	<p>3.1 Money Management</p> <p>3.1.1 Planning a income based family budget</p> <p>3.1.2 Discussion on need of saving and investment</p>	2
		<p>3.2 Maintenance and Care of Home</p> <p>3.2.1 Cleaning and polishing of household metals- brass, copper, silver, gold, steel, aluminum</p> <p>3.2.2 Cleaning of glass and window panes, different types of floors, wall</p> <p>3.2.3 Cleaning and polishing of wooden furniture</p>	4	<p>3.2 Family Resource Management</p> <p>3.2.1 Poster presentation on family resources</p> <p>3.2.2 Discussion on need of work simplification and demonstration of postures in household work (pictures)</p>	2

		3.3 Family Economics 3.3.1 Market survey on certified (government) Nepali goods and listing their name and price 3.3.2 Whole seller and retailer price list of regular commodities	2	3.3 Interior Decoration 3.3.1 Making of different types of flower arrangement 3.3.2 Making of colour chart and colour scheme 3.3.3 Collecting picture of different types of furniture for different rooms	2
		3.4 Applied physics 3.4.1 Demonstration on principle of working and operating household electric appliances 3.4.2 Demonstration on electric safety measures 3.4.3 Demonstration on lighting of the different rooms	2	3.4 Income generating activities 3.4.1 Field visit – Agriculture farm, poultry farm 3.4.2 Demonstration of making compost manure 3.4.3 Report writing	4
4	Clothing and Fashion designing	4.1 Classification of Fiber and their Properties 4.1.1 Detection of fibers (Make a file): - Burning test -Microscopic test	2	4.1 Custom Development Theories N/A	
		4.2 Weaving 4.2.1 At least 10 samples of piece of clothes of different weaving will be collected (Make a file)	3	4.2 Fashion and Design 4.2.1 Observe the trend of the change in the local costume of the people in local community. Ask the community people about it. Make a report evaluating the costumes in terms of comfort, affordability and trend of the fashion and present the report in the classroom.	3

		4.3 Fabric Selection and Sketching a Human Figure 4.3.1 Sketching a human figure: -Male -Female	3	4.3 Dyeing, Printing and Stain Remove 4.3.1 Make a handkerchief applying any one process – dyeing or print 4.3.2 Demonstration of stain removal in clothes in the classroom	2
		4.4 Terminologies Used in Clothing and Fashion Designing 4.4.1 Clothing construction - At least 5 terminologies will be used while making a tops (Make a file).	2	4.4 Body Measurement and Decorative Stitches 4.4.1 Demonstration of the way of direct and indirect body measurement as mentioned in theory 4.4.2 Make a handkerchief applying 5 decorative stitches 4.4.3 Construction of any one costume of recent fashion	5
		Total	40	Total	40

5. Learning Facilitation Method and Process

A plan of teaching Home Science must begin with an understanding of the discipline of home science. What is needed is a simple, direct explanation of the relevance and significance of home science in the modern context.

This curriculum aims at developing critical and positive thinking in students, improving their behavior, identifying talent and developing their ability, and developing creative skills so as to make them capable to lead their life efficiently. In order to give theoretical and practical knowledge of Home Science classroom activities, lab work, and field -related activities need to be carried out.

Instead of memorizing content, students should be encouraged to develop creative and practical skills by engaging in innovative works in their home and communities. This course aims to develop students' creative skills through the use of creative methods such as report writing, diagrams, posters, bar graphs, tables, photographs etc. To develop these skills, teachers play a major role in facilitating planned and diversified learning in order to develop knowledge, skills and attitudes and values according to the principles of multiple intelligence. Therefore, while facilitating learning in home science different types of student-centered teaching methods should be used.

Some useful methods used in teaching Home science are as follows:

- (a) Question answer method
- (b) Demonstration method/Practical performances
- (c) Problem solving method
- (d) Discussion method /Presentation
- (e) Observation method

- (f) Project method
- (h) Experimental method
- (i) Field trip method, Market survey
- (j) Case study method and
- (k) Practical

Teacher should facilitate the students taking into account their age, level, interest, multiple intelligence, psychological status, social background, classroom size and availability of educational materials. Teaching and learning activities can be diversified based on the school and classroom environment and nature of the subject matter. Active participation of the students, collective and collaborative learning should be encouraged. Students' problems and difficulties should be solved individually. Appropriate and effective learning environment needs to be created with the help of information technology. A conducive environment needs to be created to utilize and flourish their talent and creativity.

6. Student Assessment

Evaluation is the mechanism and process to find out whether the students have acquired knowledge, skills and attitudes as envisaged by the curriculum. Evaluation of students should take into account learning achievements and competencies acquired by all levels of students.

Written examination will be conducted under theoretical evaluation. Under practical evaluation, both formative and summative evaluation procedures will be carried out. Students' learning should be evaluated on the basis of the level wise competencies, learning achievements and related contents and skills. Learners' classroom participation and activeness in learning activities are also included in the internal evaluation process.

A. Internal Evaluation:

For internal evaluation, each student's portfolios are prepared and the records of their work and behavioral change are kept. Each student's learning level will be assessed, his problems are identified and they will be supported individually for improving their learning. Such evaluation process is called formative assessment. For teaching home science subject, homework, classwork, project work, field work, extracurricular activities, unit exams and monthly exams must be used as an integral part of classroom teaching and student records should be kept for evaluation. Based on this, students' achievement level is identified and remedial teaching learning activities should be conducted as needed. For students with special learning needs, the subject teacher must find appropriate ways to support them and assess their achievements. The teacher should emphasize the expected skills and behavior development in the students by conducting this kind of assessment continuously. The ratings should be converted to grade according to the letter grading system. Twenty-five percent weightage is allotted for internal assessment. The distribution of the weightage for internal assessment is as follows:

S.No.	Activities	Weightage
1	Classroom participation	3
2	Practical and project work (field visit and study, report writing, presentation etc.)	16
3	Terminal examinations	6

	Total	25
--	-------	----

B. External Evaluation:

Out of the total weightage, 75% will be allotted for external evaluation. Question papers for the final examinations of grade 11 and 12 should follow the specification grid prepared by Curriculum Development Centre. Questions will be related to knowledge and comprehension, problem solving, critical and creative thinking, External examinations must assess knowledge, skills and attitudes of the learners as set out in the curriculum. The letter grading system will be used in all the examinations .

Environmental Science

Grade: 11 and 12

Subject Code: Ens. 413 (Grade 11), Ens. 414 (Grade 12)

Credit Hour: 5

Annual Working hours: 160

1. Introduction

Environmental Science is an interdisciplinary subject that deals with the interrelationship and interdependence between living beings and their surrounding environment. In the present context of growing population, increased urbanization and unsustainable use of resources, the resource stock across the country as well as in globe is shrinking and degrading. In Nepal, where the national economy and people's livelihood are intricately linked to natural resources, the sustainable utilization and management of these resources has become a pressing challenge. In this connection, educating and raising environmental awareness is the key option for sustainable resource utilization. Environmental Science provides essential base for the study of complex inter-relationship between various natural and anthropogenic phenomena. Therefore, the relevancy of the subject has been greatly realized over the period of time.

This curriculum presumes that the students opting Environmental Science in Grade 11 and 12 come with diverse aspirations; some of them may continue higher level studies in Environmental Science, others may join technical and vocational areas or even other streams. The curriculum is designed to provide students with general understanding of the fundamental laws and principles governing environmental sustainability paradigms. It focuses to develop basic scientific understanding, skills, competences and attitudes required at secondary level (Grade 11-12). The curriculum expects developing environmental understanding based on scientific grounds and applications in daily life as well as obtaining new knowledge through integrated approach.

The curriculum has been structured for two years in such a way that it builds the knowledge, understanding and basic principles of environmental science with intrinsic linkages between life, livelihood and environment. It also tries to develop an understanding on local impacts of global phenomena and vice-versa. It incorporates the level-wise competencies, grade-wise leaning outcomes and scope and sequence of contents, suggested practical/project activities, learning facilitation process and assessment strategies so as to enhance the learning on the subject.

2. Level-wise Competencies

On completion of this course, students are expected to demonstrate the following competencies:

1. Relate with various components of the earth
2. Recognize the services and values obtained from ecosystem
3. Demonstrate capability in dealing with environmental resources and their effective management
4. Use appropriate tools, techniques and methods in solving environmental problems and disseminate evidence based information to the community
5. Demonstrate ability to prevent and control environmental degradation and pollution
6. Acknowledge importance of ecosystem and biodiversity for environmental stability

7. Use the environmental knowledge and technology for national development and environment sustainability

3. Grade-wise Learning Outcomes

Grade 11

S. N.	Content Area	Learning Outcomes
1.	Fundamental of Environmental Science	<p>1.1. Differentiate environment, ecology and environmental science.</p> <p>1.2. Explain scope and importance of environmental science.</p> <p>1.3. Explain environment as life supporting system (four spheres).</p> <p>1.4. Describe earth as a closed system.</p> <p>1.5. Show relationship between natural resources, population and environment.</p>
2.	Population Dynamics	<p>2.1. Explain environmental factors and population.</p> <p>2.2. Describe nutrients as limiting factors.</p> <p>2.3. Explain positive, negative and neutral interaction between the species.</p> <p>2.4. Describe R and K selected growth.</p> <p>2.5. Analyze population and community characteristics (Density, Frequency, Abundance, Natality, and Mortality).</p>
3.	Ecosystem Dynamics	<p>3.1. Delineate structural and functional aspects of ecosystem.</p> <p>3.2. Describe evolution of ecosystems.</p> <p>3.3. Classify various types of ecosystems.</p> <p>3.4. Define food chain, food web and trophic level.</p> <p>3.5. Explain nutrients (P, C, N, S) and energy flow in ecosystem.</p>
4.	Environmental Resources	<p>4.1. Classify various environmental resources.</p> <p>4.2. Describe water resources with respect to its spatial and temporal variability, water crisis, conservation.</p> <p>4.3. Identify and explain major forest types of Nepal, and discuss cause and consequences of forest degradation and fragmentation.</p> <p>4.4. Explain mineral resources of Nepal in term of potential and uses, environmental implication of mining.</p> <p>4.5. Discuss energy resources (demand-supply trend and projection, renewable and non-renewable energy, use of alternative energy sources).</p> <p>4.6. Discuss ecocentric and anthropocentric perspective of resource management.</p>

		4.7. Identify various types of ecosystem services and evaluate them.
5.	Biodiversity Conservation	5.1. Define biodiversity. 5.2. Describe biodiversity hotspots. 5.3. Discuss threats to biodiversity and conservation approaches (in-situ/ex-situ) in Nepal- Protected Areas, Conservation Areas, Hunting Reserves, Zoos, Botanical Gardens. 5.4. Explain biodiversity conservation approaches (species, ecosystem, landscape, trans-boundary).
6.	Environmental Degradation	6.1. Define environmental degradation. 6.2. Analyze various causes of environmental degradation: population growth, industrialization, urbanization, unsustainable agriculture. 6.3. Describe consequences of environmental degradation: pollution, soil erosion and siltation, habitat loss, loss of biodiversity. 6.4. Explain various control measures of environmental degradation.
7.	Environmental Pollution	7.1. Define pollution. 7.2. Describe air, water, land, noise and radiation pollution. 7.3. Identify various causes and sources of pollution. 7.4. Evaluate the effects of environmental pollution on human health, agriculture, ecosystem, biodiversity, water resources. 7.5. Find out the various pollution prevention measures.
8.	Environmental Hazards	8.1. Define hazard, vulnerability, risk and disaster. 8.2. Classify different types of hazards (Natural and Anthropogenic). 8.3. Describe Disaster Risk Management (DRM) Cycle. 8.4. Explain Disaster Risk Reduction (DRR) approaches. 8.5. Analyze Disaster Risk Reduction/Management in Nepal.
9.	Chemical Environment	9.1. List out different chemicals in found in the environment. 9.2. Explain chemical and photochemical reactions in atmosphere and environmental impacts of chemical reactions. 9.3. Describe chemical reactions in natural and waste-water. 9.4. Demonstrate acid-base and ion exchange reactions in soil. 9.5. Explain industrial chemicals in environment.

10.	Quantitative Environmental Analysis	<p>10.1. Describe quantitative analysis.</p> <p>10.2. Give the concept of calibration, accuracy and precision.</p> <p>10.3. Prepare chemical solutions (molar, molal, normal).</p> <p>10.4 Explain function of instruments used in environmental analysis (pH meter, EC meter, TDS meter, DO meter, weighing machine, desiccators, soil sampling auger, spectrophotometer, colorimeter, Atomic Absorption Spectrophotometer, Flame Photometer, Chromatograph).</p> <p>10.5. Explain volumetric, gravimetric, potentiometric, conductometric, and electrometric methods.</p> <p>10.6. Compare electrolytic and colorimetric analysis.</p>

3.2 Grade 12

S.N.	Content Area	Learning Outcomes
1.	Atmospheric Environment	<p>1.1. Define atmosphere.</p> <p>1.2. Explain atmospheric composition.</p> <p>1.3. Illustrate vertical zonation of atmosphere (Troposphere, Stratosphere, Mesosphere, Thermosphere).</p> <p>1.4. Characterize various meteorological parameters (heat budget, temperature, temperature inversion, pressure, wind-velocity, direction, humidity and precipitation).</p> <p>1.5. Define brown and grey air smog.</p> <p>1.6. Describe transport and diffusion of pollutants.</p>
2.	Hydrospheric Environment	<p>2.1. Define hydrological cycle</p> <p>2.2. Explain global distribution of water.</p> <p>2.3. Discuss unique properties of water.</p> <p>2.4. Describe water as ecological medium.</p> <p>2.5. Define and characterize lentic and lotic environment and, lake stratification and zonation.</p>
3.	Lithospheric Environment	<p>3.1. Define lithosphere and soil.</p> <p>3.2. Discuss characteristics and properties of soil (physical, chemical and biological).</p> <p>3.3. Describe soil profile and pedogenic processes.</p> <p>3.4. Describe soil-water interactions.</p> <p>3.5. Explain impacts of anthropogenic activities on soil and their remedial measures.</p>

4.	Biodiversity Assessment	<p>4.1. Define biodiversity assessment.</p> <p>4.2. Select appropriate sampling sites.</p> <p>4.3. Demonstrate vegetation sampling (Plot and Plot-less) methods.</p> <p>4.4. Describe direct and indirect sampling methods (Animal).</p> <p>4.5. Explain quantification techniques.</p>
5	Climate Science	<p>5.1. Differentiate weather and climate.</p> <p>5.2. Describe insolation and heat Budget (albedo).</p> <p>5.3. Define greenhouse effects, climate change and global warming.</p> <p>5.4. Explain green house and global warming mechanism.</p> <p>5.5. Describe climate change impacts on Himalayan glaciers, water resource, agriculture, forest and biodiversity, health, tourism) in Nepal.</p> <p>5.6. Discuss climate change adaptation and mitigation measures.</p>
6.	Solid Waste Management	<p>6.1. Classify solid wastes.</p> <p>6.2. Explain sources, characteristics of solid wastes.</p> <p>6.3. Describe effects of solid waste on environment.</p> <p>6.4. Comprehend solid waste management approaches (collection, segregation, storage and transportation).</p> <p>6.5. Prepare the hierarchy of solid waste management.</p> <p>6.6. Apply solid waste management techniques: Open dumping, sanitary land filling, composting (aerobic and anaerobic), vermi-composing, incineration and energy recovery, integrated waste management.</p>
7.	Environmental Toxicology	<p>7.1. Define toxic chemical.</p> <p>7.2. Illustrate the major toxic chemicals in environment.</p> <p>7.3. Describe acute and chronic toxicity, and factors affecting toxicity.</p> <p>7.4. Explain toxicity response curve with suitable diagram.</p> <p>7.5. Relate effects of toxic chemicals in environment (population, ecosystem) and global incidences.</p> <p>7.6. Analyze the process of bio-accumulation, bio-magnification in ecosystems.</p>
8.	Pollution Control Approaches	<p>8.1. Define pollution control.</p> <p>8.2. Identify sources of pollution and their reduction measures.</p> <p>8.3. Discuss the technological approaches (zero emission, waste</p>

		<p>treatment, energy efficient technologies, renewable energy, sustainable agriculture, 3R principles, etc.) of pollution control.</p> <p>8.4. Observe and prepare a report on primary and secondary methods of waste-water treatment.</p> <p>8.5. Describe the legal approaches (policies, laws, rules and regulations) of pollution control and role of local government.</p>
9.	Environmental Tools and Techniques	<p>9.1. Recognize the various geospatial tools and techniques: GPS, Theodolite, Geographical Information System (GIS), Remote Sensing (RS).</p> <p>9.2. Identify various source of geospatial data: Satellite images and topographic maps.</p> <p>9.3. Locate geographical coordinate system (degree decimal, degree-minute-second) and geo-referencing.</p> <p>9.4. Explain land measurements system (various units).</p> <p>9.5. Describe the working principle and application of GIS and RS in environmental studies.</p>
10.	Environmental Policies	<p>10.1. Recognize the need of environmental laws (Policies, Acts, Rules, Regulations, standards) in Nepal.</p> <p>10.2. Explain historical evolution of Environmental Laws (global and Nepalese perspective).</p> <p>10.3. List out the major environmental laws in Nepal.</p> <p>10.4. Analyze Environmental Assessment Provisions (IEE, EIA, SEA) and Implementation in Nepal.</p> <p>10.5. Describe Environment Assessment Process: screening, scoping, preparation of terms of reference, baseline information collection, etc.</p>

4. Scope and Sequence of Contents

Grade 11

S. N.	Content Area	Elaboration of Contents	Working hours
1	Fundamentals of Environmental Science	<p>1.1. Concept of environment, ecology and environmental science</p> <p>1.2. Scope and importance of environmental science</p> <p>1.3. Environment as life supporting system (four spheres)</p> <p>1.4. Earth as a closed system</p> <p>1.5. Relationship between natural resources,</p>	8

		population and environment	
2	Population Dynamics	<p>2.1. Concept of environmental factors and population</p> <p>2.2. Nutrients as limiting factors</p> <p>2.3. Species interactions: positive, negative and neutral</p> <p>2.4. R and K selected growth</p> <p>2.5. Population and community characteristics (Density, Frequency, Abundance, Natality, Mortality)</p>	12
3	Ecosystem Dynamics	<p>3.1. Concept and components (Structural and Functional) of Ecosystem</p> <p>3.2. Evolution of ecosystem</p> <p>3.3. Types of ecosystem</p> <p>3.4. Food chain, food web and trophic level</p> <p>3.5. Nutrients (P, C, N, S) cycle and role of micro-organism and energy flow in ecosystem</p>	12
4	Environmental Resources	<p>4.1. Concept of environmental resources and their classification</p> <p>4.2. Water resources (spatial and temporal variability, water crisis, conservation)</p> <p>4.3. Forest: major forest types of Nepal, fragmentation and degradation, cause and consequences of forest degradation</p> <p>4.4. Mineral Resources (potential and uses, environmental implication of mining)</p> <p>4.5. Energy Resources (demand-supply trend and projection, renewable and non-renewable energy sources)</p> <p>4.6. Perspectives of resource management (eco-centric and anthropocentric)</p> <p>4.7. Ecosystem services: concept, types and valuation</p>	12
5	Biodiversity Conservation	<p>5.1. Concept of biodiversity</p> <p>5.2. Biodiversity hotspots</p> <p>5.3. Threats to biodiversity</p> <p>5.4. Biodiversity conservation (in-situ/ex-situ) in Nepal- National Parks, Wildlife Reserves, Conservation Areas, Hunting Reserves, Zoos, Botanical Gardens</p>	12

		5.5. Biodiversity conservation approaches (species, ecosystem, landscape, trans-boundary)	
6	Environmental Degradation	6.1. Concept of environmental degradation, 6.2. Causes of environmental degradation: population growth, industrialization, urbanization, unsustainable agriculture, 6.3. Consequences of environmental degradation: pollution, soil erosion and siltation, habitat loss, loss of biodiversity 6.4 Control measures of environmental degradation	12
7	Environmental Pollution	7.1. Concept of pollution 7.2. Pollution types: air, water, land, noise, radiation 7.3. Causes and sources of pollution 7.4. Effects of environmental pollution: human health, agriculture, ecosystem, biodiversity, water resources 7.5. Pollution prevention measures	13
8	Environmental Hazards	8.1. Concept of hazard, vulnerability, risk, disaster 8.2. Types of hazard (Natural and Anthropogenic) 8.3. Disaster Risk Management (DRM) Cycle 8.4. Disaster Risk Reduction (DRR) approaches 8.5. Disaster Risk Reduction/Management in Nepal	12
9	Chemical Environment	9.1. Concept of chemical environment 9.2. Chemical and photochemical reactions in atmosphere and environmental impacts of chemical reactions 9.3. Chemical reactions in natural and waste water 9.4. Acid-base and ion exchange reactions in soil 9.5. Industrial chemicals in environment	12
10	Quantitative Environmental Analysis	10.1. Concept of quantitative analysis 10.2. Calibration, accuracy and precision 10.3. Chemical solutions: molarity, molality, normality, buffer solution, standard solutions 10.4. Instruments in environmental analysis (pH meter, EC meter, TDS, DO, weighing machine, desiccators, soil sampling auger, spectrophotometer, colorimeter, AAS, Flame	15

		<p>Photometer, Chromatograph)</p> <p>10.5. Volumetric, gravimetric, potentiometric, conduct metric, and electrometric methods</p> <p>10.6. Electrolytic and Colorimetric analysis</p>	
--	--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

Grade 12

S. N.	Content Area	Elaboration of Contents	Working Hours
1	Atmospheric Environment	<p>1.1. Concept of atmospheric environment</p> <p>1.2. Atmospheric composition</p> <p>1.3. Vertical zonation of atmosphere</p> <p>1.4. Meteorological parameters (Heat budget, temperature, temperature inversion, pressure, wind-velocity, direction, humidity and precipitation)</p> <p>1.5. Brown and grey air smog</p> <p>1.6. Transport and diffusion of pollutants</p>	12
2	Hydrospheric Environment	<p>2.1. Concept of hydrological cycle</p> <p>2.2. Global distribution of water</p> <p>2.3. Unique properties of water</p> <p>2.4. Water as ecological medium</p> <p>2.5. Lentic and lotic environment and their characteristics, lake stratification and zonation</p>	10
3	Lithospheric Environment	<p>3.1. Concept of lithosphere and soil</p> <p>3.2. Properties of soil: physical, chemical and biological</p> <p>3.3. Soil profile and pedogenic processes</p> <p>3.4. Soil-water interactions</p> <p>3.5. Anthropogenic activities on soil: impact and remedial measures</p>	10
4	Biodiversity Assessment	<p>4.1. Concept of biodiversity assessment</p> <p>4.2. Selection of sampling sites</p> <p>4.3. Vegetation sampling (Plot and Plot-less) methods</p> <p>4.4. Direct and indirect sampling methods (Animal)</p> <p>4.5. Quantification techniques</p>	10

5	Climate Science	<p>5.1. Concept of weather and climate</p> <p>5.2. Insolation and heat budget (Albedo)</p> <p>5.3. Green house effects, climate change and global warming</p> <p>5.4. Green house and global warming mechanism</p> <p>5.5. Climate change impacts (Himalayan glaciers, water resource, agriculture, forest and biodiversity, health, tourism) in Nepal</p> <p>5.6. Climate change adaptation and mitigation</p>	12
6	Solid Waste Management	<p>6.1. Concept and types of solid wastes</p> <p>6.2. Sources and characteristics of solid wastes</p> <p>6.3. Effects of solid waste on environment</p> <p>6.4. Solid waste management approaches (collection, segregation, storage and transportation)</p> <p>6.5. Hierarchy of solid wastes management</p> <p>6.5. Solid waste management techniques: open dumping, sanitary land filling, composting (aerobic and anaerobic), vermi-composting, incineration and energy recovery, integrated waste management</p>	14
7	Environmental Toxicology	<p>7.1. Concept of toxic chemicals in environment</p> <p>7.2. Major toxic chemicals in environment</p> <p>7.3. Acute and chronic toxicity, and factors affecting toxicity</p> <p>7.4. Toxicity response curve</p> <p>7.5. Effects of toxic chemicals on environment (population, ecosystem) and global incidences</p> <p>7.6. Bio-accumulation, bio-magnification in ecosystems</p>	12
8	Pollution Control Approaches	<p>8.1. Concept of pollution control approaches</p> <p>8.2. Source inventory and reduction</p> <p>8.3. Technological approaches (zero emission, waste treatment, energy efficient technologies, renewable energy, sustainable agriculture, 3R Principles, etc.) of pollution control</p> <p>8.4. Waste water treatment (primary and secondary)</p> <p>8.5. Legal approaches (policies, laws, rules and regulations), role of local government</p>	15

9	Environmental Tools and Techniques	<p>9.1. Concept of geospatial tools and techniques [GPS, Theodolite, Geographical Information System (GIS), Remote Sensing (RS)]</p> <p>9.2. Source of data: satellite images and topographic maps</p> <p>9.3. Geographical coordinate system (degree decimal, degree-minute-second) and geo-referencing</p> <p>9.4. Land measurements system (various units)</p> <p>9.5. Working principle and application of GIS and RS in environmental studies</p>	12
10	Environmental Policies	<p>10.1. Concept of environmental laws (Policies, Acts, Rules, Regulations, Standards)</p> <p>10.2. Historical evolution of environmental laws (global and Nepali perspective)</p> <p>10.3. Major environmental laws in Nepal</p> <p>10.4. Environmental Assessment Provisions (IEE, EIA, SEA) and Implementation in Nepal</p> <p>10.5. Environment Assessment Process: screening, scoping, preparation of terms of reference, baseline information collection, etc.</p> <p>10.6. Sustainable development, Sustainable Development Goals and approaches</p>	13
Total			120

5. Suggested Practical/Project Activities

This curriculum provides students with the opportunity to explore a range of topics of Environmental Science, and foster the skills to analyze the real field situations, including contemporary environmental challenges; the impact of the pollution on ecosystem health; waste management, etc. Students will also increase their scientific understanding and examine the interrelationships between science, environment and society. Project works outlined in the curriculum consist of activities designed to demonstrate the understanding and ideas through collecting, processing, analyzing and communicating the information. 40 working hours has been designated to practical and project activities in each grade. The practical/project works will enable the students to do the following.

- Identify and apply tools used in environmental sampling and analyze environmental data.
- Investigate a range of perspectives that have contributed to scientific knowledge about the environment, and apply these knowledge and procedures addressing environmental problems/issues.
- Recognize the major contemporary environmental challenges, acquire knowledge and demonstrate capability to report such situations.

The table below shows the suggested practical activities and projects works for both grades.

Practical Activities for Grade 11 (Any Eight)
<ol style="list-style-type: none">1. Analyze the population trend of local/state/federal levels of Nepal. Assess how the population is increasing over time. Make the population pyramid of recent population census of Nepal.2. Considering forest are nearby your settlement or school area, prepare a checklist of the plant species with their uses; enumerate the local names and scientific names for the species identified.3. Illustrate with some primary data, pyramid of biomass and number of nearby grassland ecosystem.4. Depict the energy consumption scenario in different sectors of Nepal.5. Illustrate and draw diagram of the equipment used in volumetric analysis. Write the function of each equipment.6. Prepare stock solution of the given concentration and series of standard solutions of different concentration from the stock solution. Illustrate how the color of the standard solutions changes with change in concentrations.7. Measure and analyze pH, temperature, total suspended and dissolved solids contents in water samples collected from aquatic ecosystem.8. Determine and compare transparency of any two aquatic ecosystems (nearby lakes) using Secchi disk.9. Determine pH and bulk density of soils found in agriculture land, grassland and/or forestlands.10. Determine temperature of soils found in agriculture land, grassland and/or forestlands.11. Determine moisture content and water holding capacity of soils found in agriculture land, grassland and/or forestlands.12. Determine the sound level in and around your surrounding area (using sound level meter).
Practical Activities for Grade 12 (Any Twelve)
<ol style="list-style-type: none">1. Prepare list of various techniques for studying (plant and animal) populations and communities. Describe about each of them.2. Determine and compare frequency, density and abundance of tree species of forest ecosystems having two different scenarios (for example, northern and southern facing slopes, disturbed and undisturbed forest sites, etc.).3. Determine the distribution pattern of plant species (use either primary or secondary data). Analyze the data using mean variance ratio test.4. Make a wind-rose diagram from provided wind velocity data of a given meteorological station.5. Determine relative and absolute humidity of an area (either from secondary data or primary data).6. Analyze temperature and precipitation trend of one of a meteorological station of Nepal.

7. Determine the emission of greenhouse gases from energy use from various sources (using suitable IPCC protocol).
8. Assess the chlorophyll-a content in the selected aquatic ecosystem. Link it with the trophic status.
9. Collect the data of ambient air quality monitoring and analyze the collected data (authentic websites should be used for the retrieving air quality data).
10. Make the horizontal temperature profile of a selected area (choose nearby forest land, agricultural land, urban area and rural settlement sites, and compare the observed temperature in the area).
11. With the help of a topographic map, sketch different features of the selected catchment area.
12. Collect solid waste from household of nearby settlement and perform the analysis of solid waste composition and characterization.
13. Illustrate the methods of collection, processing and storage of effluent samples for physico-chemical analysis.
14. Determine the change in physical (temperature, total solids) and chemical (Dissolved Oxygen, pH, hardness, alkalinity, chloride) parameters of streams/river along the stretches.
15. Make a flowchart of EA process for development project in Nepal. Assess the EA report available (online or in hard copy), and list the different chapters and their organization.

Project Works for Grade 11 (Any Five)

1. Prepare a short report on types of ecosystem services provided by the lentic or lotic ecosystem. Provide quantitative information about provisioning services.
2. Prepare a report on local initiatives to reduce the impacts of pollution on human health (e.g., community cleanup and local level movements) [Suggestion: Before starting a project, prepare a checklist of activities to facilitate data collection].
3. Visit nearby waste-water treatment plant. Prepare a short report explaining and distinguishing the primary and secondary treatment processes of the plant; or if waste-water treatment plant is not available nearby your settlement, make an extensive review and prepare a short description report about the wastewater treatment processes).
4. Prepare list of disaster events (landslides, flooding, glacial lake outburst flood, flash floods, drought, epidemics, etc.) relevant to your area or nearby (Hint: taking help from senior citizens).
5. Identify the major potential disasters that can occur in your school, community/ward or municipality. Learn about disaster preparedness and safety using the internet and interviewing local experts. Use the information to create an emergency preparedness plan that can be shared with the school, community and local authorities.
6. Prepare list of the natural resources available in your locality or municipality. Learn how other municipality, cities and counties getting economic benefit sustainably managing the resources. Prepare you own resource map and management plan which can be shared with local community member or local government officials.

Project Works for Grade 12 (Any Five)

1. Visit and observe a nearby ecosystem, prepare a report listing the abiotic and biotic factors. Illustrate how these factors are linked with each other.
2. Make a report about impacts of anthropogenic activities on soil environment (consider the site polluted due to of chemical fertilizer/pesticide or pollution or excavated or mine site).
3. Resource conservation project activities.
4. Visit nearby landfill site and prepare a report describing the features, storage capacity, ongoing activities, opportunities and challenges of the landfill site. (Suggestion: prepare a checklist of information to be collected before starting the project).
5. Visit nearby zoo (or any ex-situ conservation areas), list the ongoing practices, and prepare a report including opportunities/challenges of the ex-situ conservation practice.
6. Visit any industry nearby locality list the energy used, raw materials used, processing, product, pollutants emitted from the industry, noise and list the pollution control technologies (and their working principles) installed by the industries.
7. Visit and observe your village (Ward) and make the list of environmental problems (please try to collect as much as possible available secondary data) and prepare a report about the best ways to solve those environmental problems.
8. Considering a nearby urban area (close to your residence), prepare a report showing impacts of urbanization in altering hydrological process (Suggestion: prepare a checklist of information to be collected before starting the project).

6. Learning Facilitation Process and Methods

Students will be facilitated to learn rather than just accumulation of information. Teacher plays vital role for delivering subject matters. Student centered teaching-learning process is highly emphasized. Students are encouraged to adopt multiple pathways of learning, such as online search, field visit, library visit and literature review, laboratory work, individual and group work, research work, etc. with the support of teacher. Self-study by students is highly encouraged and learning will not be confined merely within the scope of curriculum. Teacher should keep in mind intra and inter-disciplinary approach to teaching and learning, as opposed to compartmentalization of knowledge. Supportive role of parents/guardians in creating conducive environment for promoting the spirit of inquiry and creativity in students' learning is anticipated.

During the delivery process of environmental science teaching in grade 11 and 12, basically the following three approaches will be adopted.

1. Conceptual/Theoretical Approach

The conceptual approach may include the following methods and techniques.

- a. lecture
- b. discussion and interaction
- c. question answer
- d. demonstration
- e. ICT/online based instructions
- f. cooperative learning
- g. debate
- h. group discussions (satellite learning group, peer group, small and large group)
- i. seminar presentation
- j. daily assignment
- k. project based learning
- l. innovation/discovery
- m. field survey
- n. participating national and international environmental events

2. Practical/Application/Experimental Approach

Practical work is the integral part of the learning environmental science. The process of lab based practical work comprises

- a. familiarity with objective of practical work
- b. familiarity with materials, chemicals, apparatus
- c. familiarity with lab process (safety, working modality, etc.)
- d. conduction of practical work (systematically following the given instruction)
- e. analysis, interpretation and drawing conclusion

3. Project Work Approach

Project work is an integral part of the learning in environmental science. Students should be involved in project work to foster self-learning of students in both theoretical and practical contents. Students will complete project work to have practical idea through learning by doing approach and able to connect the theory into the real world context. It is regarded as method/process of learning rather than content itself. So use of project work method to facilitate any appropriate contents of this curriculum is highly encouraged.

In this approach, student will conduct at least one research work, or an innovative work under the guidance of teacher, using their knowledge and skills. It could include any of the followings:

- a. Mini research
- b. Survey
- c. Model construction
- d. Paper based work
- e. Study of ethno-science

General process of research work includes the following steps.

- a. Understanding the objective of the research
- b. Planning and designing
- c. Collecting information
- d. Analysis and interpretation
- e. Reporting /communicating (presentation, via visual aids, written report, graphical etc.)

General process of innovative work includes the following steps;

- a. Identification of innovative task (either assigned by teacher or proposed by student)
- b. Planning
- c. Performing the task
- d. Presentation of the work
- e. Record keeping of the work

Students are free to choose any topic listed in this curriculum or a topic suggested by teacher provided that it is within the theoretical contents of the curriculum. However, repetition of topic should be discouraged.

7. Student Assessment

Evaluation is an integral part of learning process. Both formative and summative modes of evaluation are emphasized. Formative evaluation will be conducted so as to provide regular feedback for students. Class tests, unit tests, trimester test, oral question-answer, home assignment, etc., are some ways of formative evaluation.

There will be separate evaluation of theoretical and practical learning. Summative evaluation embraces both internal and external evaluation.

a) Internal Evaluation

Student's knowledge, skills and competencies will be measured through internal evaluation in both the Grades 11 and 12. The internal evaluation carries 25 percent of weightage for final evaluation of student achievement. The following table shows the criteria for the internal evaluation:

S. N.	Criteria	Marks
1	Classroom participation (Daily attendance, home assignment and classwork, participation in learning, participation in other activities)	3
2	Trimester exam (3 marks from each trimester exam)	6
3	Practical work	10
4	Project work, project report and presentation	6
	Total	25

The criteria for evaluating practical work and project works are in the table below.

S.N.	Criteria for Evaluation of Practical Work	Elaboration of criteria	Marks
1.	Laboratory experiment	Correctness of apparatus setup/preparation	1
		Observation/experimentation	1
		Tabulation	1
		Data processing and analysis	1
		Conclusion (Value of constants or prediction with justification)	1
2.	Viva-voce	Understanding of objective of the experiment	1
		Skills of the handling of apparatus in use	1
3	Practical work records	Records (number and quality)	3
	Total		10

Project Works Evaluation

S.N.	Criteria for Project Works Evaluation	Marks
1.	Reports (background, objective, materials and methods, finding, conclusion)	4
2.	Presentation	2
	Total	6

b) External Evaluation

External evaluation will take the form of written examination which carries 75 marks. The types and number questions will be as per the test specification chart developed by the Curriculum Development Centre.

General Law

Grades: 11 and 12

**Subject Code: Gel.415 (Grade 11),
Gel .416 (Grade 12)**

Credit Hours: 5

Working Hours: 160

1. Introduction

General Law is the territorial law of a country. It provides realistic knowledge of law which is useful for everybody in day to day real life situation. The study of General Law in secondary level is important to enhance the capacity of students relating to the provision of national law and also to prepare committed human resources who will pursue higher education in the field of law.

This curriculum incorporates concept, Nature and Purpose of Law, Function of Law in Society, Autonomy of Law and Legal system, Structure of Law in Nepal, Rule of Law, Separation of Power, Dispute settlement etc. It also consists Theory of Rights and Classification of Rights, Enforcement of Fundamental Rights, Law relating to Land, Property, Intellectual Property, Transaction, Investigation and Prosecution system in Nepal, Jurisdiction of Courts and Quasi-Judicial Bodies in Nepal.

The curriculum has been offered as per the structure of National Curriculum Framework. It provides a comprehensive outline of level-wise competencies, grade-wise leaning outcomes and scope and sequence of contents, suggested practical/project activities, learning facilitation process and assessment strategies so as to enhance the learning on the subject systematic.

2. Level-wise Competencies

At the end of this course, the students will have developed the following competencies:

1. Explain the characteristics of law.
2. Compare and contrast various types of society and the existence of law.
3. Describe the functions of law in society.
4. Demonstrate the understanding of autonomy of law in Nepal and identify the sources of legal system.
5. Explain the structure of law and categorize federal law, state law and local level law.
6. Assess the general principles of civil law and civil rights in Nepal.
7. Illustrate the position of sanctity of natural person and examine legal provisions relating to natural person.
8. Evaluate the position of rule of law and separation of powers in Nepal.
9. Distinguish between formal dispute settlement through judiciary and alternative dispute settlement processes.
10. Explain the nature and theory of right and classification of rights.
11. Analyze enforcement of fundamental rights in Nepal.
12. Compare and contrast law relating to land, government property, public property, community property and private property in Nepal.
13. Explain intellectual property and its categories.

14. Demonstrate an understanding of laws relating to transaction, kinds of deeds to be registered and secured transaction.
15. Illustrate the position of legal deeds and draft the legal deeds frequently used in legal transactions in Nepal.
16. Introduce criminal law and explain its nature and principles.
17. Identify new forms of crimes emerging in Nepal and describe the legal provisions to control them.
18. Describe the criminal investigation and prosecution system in Nepal.
19. Explain jurisdiction of courts and quasi-judicial bodies in Nepal.

3. Grade-wise Learning Outcomes

3.1 Grade 11

Unit	Content Area	Learning Outcomes
1	Concept, Nature and Purposes of law	1.1 Explain the characteristics of law. 1.2 Analyze the nature of law. 1.3 Interpret the purposes of law.
2	Law and Society	2.1 Define society and explain social welfare. 2.2 Compare and contrast various types of society. 2.3 Interpret position of law in society. 2.4 Disseminate that law operates in society for its needs and law as an essential factor in society.
3	Functions of Law in Society	3.1 Analyze the functions of law in society. 3.2 Examine political and economic functions of law in society 3.3 Explain law as one of the effective instrument of regulating society.
4.	Autonomy of Law and Legal System	4.1 Discuss the position of autonomy of law in Nepal. 4.2 Explain the meaning of legal system and status of Nepali legal system. 4.3 Explain the sources of legal system.
5	Structure of Law in Nepal	5.1 Categorize public law, private law, federal law, state law and local level law. 5.2 Explain the structure of written laws- constitution, statutes, <i>Muluki</i> Criminal and Civil Codes 2074 (2017), rules, regulations, by-laws, ordinances, case law, executive orders.
6	Principles of Civil	6.1 Assess the general principles of civil law.

	Law and Civil Rights of Nepal	6.2 Define rights. 6.3 Explain the provisions relating to civil rights enshrined in the <i>Muluki Civil Code 2017 (2074 B.5)</i> .
7.	Sanctity of Natural Person and Law Relating to Natural Person	7.1 State and explain sanctity of natural person. 7.2 Differentiate natural person from legal person. 7.3 Describe legal provisions relating to natural person in Nepal.
8.	Rule of law and Separation of Powers	8.1 Define rule of law. 8.2 Evaluate the position of rule of law in Nepal. 8.3 Discuss on the position of separation of powers in Nepal.
9.	Dispute Settlement Mechanism: Formal Court System and Alternative Dispute Resolution	9.1 Interpret the dispute resolution through the formal court system in Nepal. 9.2 Discuss the role of courts establishing criminal and civil justice system. 9.3 Explain the role of investigation and prosecution systems in Nepal. 9.4 Examine the status of alternative dispute resolution in Nepal.

3.2 Grade 12

Unit	Content Area	Learning Outcomes
1	Nature and Theory and Classification of Rights.	1.1 Explain the nature and theory of rights. 1.2 Interpret the classification of rights. 1.3 Show an understanding of human rights, fundamental rights and legal rights. 1.4 Discuss the kinds of legal rights.
2	Enforcement of Fundamental Rights in Nepal	2.1 Explain the enforcement of fundamental rights in Nepal. 2.2 Interpret the legal position of right to social security, social justice, right to employment, right to education legal provisions relating to right of senior citizens and right of children in Nepal.
3	Land and Property Law in Nepal	3.1 Explain the laws relating to land in Nepal. 3.2 Distinguish between government property, public property, community property and private property. 3.3 Examine the legal provisions relating to trust (<i>guthi</i>) in Nepal.
4.	Law Relating to	4.1 Explain the meaning and importance of intellectual property.

	Intellectual Property	4.2 Categorize intellectual property. 4.3 Explain the position of intellectual property laws in Nepal. 4.4 Show an understanding of the position of industrial and cyber property in Nepal. 4.5 Differentiate between copyright and neighboring rights and categorize copyrights. 4.6 Categorize cyber property of Nepal. 4.7 State the laws relating to intellectual property in Nepal.
5	Laws Relating to Transaction and Secured Transaction	5.1 Enlist the documents which are required to be registered. 5.2 Explain the need of registration of deeds and position of law relating to secured transaction in Nepal.
6	General Introduction to Legal Deeds and Drafting of Deeds	6.1 Assess the necessity of drafting of deeds. 6.2 Draft the legal documents for instance, petition, FIR, contract paper, deed of will, power of attorney etc.
7.	Introduction to Criminal Law and New Forms of Crimes	7.1 Explain the nature of criminal law, principles of criminal law and elements of crime. 7.2 Assess the new forms of crimes, such as organized crime, cyber-crime, offenses relating to violence against women (rape, marital rape, <i>chhaupadi</i> system etc.)
8.	Criminal Investigation and Prosecution system in Nepal	8.1 Evaluate the investigation system in Nepal. 8.2 Show an understanding of the position of prosecution system and power of government attorney to take decision of initiating case in the court in Nepal.
9.	Jurisdiction of Courts and Quasi- Judicial Bodies in Nepal	9.1 Interpret the jurisdictions of District Court, High Courts and Supreme Court in Nepal. 9.2 Explain the jurisdiction of quasi-judicial bodies in Nepal.

4. Scope and Sequence of Contents

4.1 Grade 11

Unit	Content Area	Elaboration of Contents	Working Hours
1	Concept, Nature and Purpose of Law	1.1 Concept of Law 1.2 Nature of law 1.3 Purpose of law 1.4 Characteristics of law	20

		1.5 Importance of law	
2	Law and Society	2.1 Law and society 2.1.1 Relation of law and society 2.1.2 Society and social welfare 2.2 Types of society: homogenous society, heterogeneous society, international society. 2.3 Position of law in society	16
3	Functions of Law in Society	3.1 Social functions of law 3.2 Political functions of law 3.3 Economic functions of law	16
4.	Autonomy of law and legal system	4.1 Autonomy of law (legislation, codification, formal organization, precedent) 4.2 Autonomy of law-law seen as containing and regulating state power 4.3 Meaning of legal system 4.4 Sources of legal system (basic law (constitutional law, legislation, common law, codification, customary law, precedent)	12
5	Structure of Law in Nepal	5.1 Public law and private Law 5.2 Federal law 5.3 State law (seven states in Nepal) 5.4 Local level law (municipalities and Village Bodies) 5.5 Written laws in Nepal: constitution, statutes, codes, rules, regulations, by-laws, bills, ordinances and executive orders.	12
6	Principles of Civil Law and Civil Rights in Nepal	6.1 General principles of civil law 6.2 Meaning and importance of civil rights 6.3 Provisions civil rights in Nepal	12
7.	Sanctity of Natural Person and Law Relating to Natural Person	7.1 Sanctity of natural person-purity, inviolability and integrity of person 7.2 Differences between natural person and legal person 7.3 Legal provisions relating to natural person in Nepal	10
8.	Rule of law and	8.1 Meaning of rule of law	10

	Separation of Powers	8.2 Development of rule of law 8.3 Origin of the concept of separation of powers 8.4 Position of separation of powers in Nepal	
9.	Dispute settlement mechanism: Formal Court System and Alternative Dispute Resolution	9.1 Role of court in the settlement of disputes 9.2 Role of court in establishing civil justice and criminal justice in Nepal 9.3 Role of investigation officer and public prosecutor helping to settle disputes 9.4 Status of alternative dispute resolution (mediation, conciliation and arbitration) in Nepal	12
		Total	120

4.2 Grade 12

Unit	Content Area	Elaboration of contents	Working Hours
1	Nature Theory and Classification of Rights	1.1 Nature of rights 1.2 Theory of rights 1.3 Classification of rights 1.3.1 Human rights 1.3.2 Fundamental rights 1.3.3 Legal rights	14
2	Enforcement of Fundamental Rights in Nepal	2.1 Right to housing 2.2 Right to education 2.3 Right to employment 2.4 Right to privacy 2.5 Right to food and food sovereignty 2.6 Crime and punishment against racial discrimination and untouchability 2.7 Consumer protection 2.8 Social security and social justice 2.9 Protection of crime victim 2.10 Protection of senior citizen 2.11 Right of children	16
3	Law Relating Land and Property.	3.1 Law relating to land 3.2 Land ceiling for family and citizen of Nepal	14

		<p>and exemption from land ceiling</p> <p>3.3 Government property</p> <p>3.4 Public property</p> <p>3.5 Community property</p> <p>3.6 Trust (<i>Guthi</i>)</p>	
4.	Law Relating to Intellectual Property	<p>4.1 Meaning and importance of intellectual property</p> <p>4.2 Categories of intellectual property</p> <p>4.2.1 Industrial property: patents, trademark, industrial design, integrated circuit, geographical indication etc.</p> <p>4.2.2 Copyright and neighboring rights</p> <p>Copyright: literary works, artistic works, architectural works and related rights</p> <p>4.3 Cyber property: copyrighted matter, software, protocol, web page, layout designs, domain name, text image, semi-conductor, virtual currency (bit coin).</p> <p>4.4 Laws relating to intellectual property in Nepal.</p>	16
5	Laws Relating to Transaction and Secured Transaction	<p>5.1 Provisions relating to transaction</p> <p>5.2 Legal provisions relating to secured transaction</p> <p>5.3 Registration of deeds</p> <p>5.3.1 Kinds of deeds to be registered</p> <p>5.3.2 Transmission, registration and de-registration</p>	12
6	General Introduction to legal Deeds and Drafting of Deeds	<p>6.1 First information report</p> <p>6.2 Lawsuit (complaint)</p> <p>6.3 Defense reply (rejoinder)</p> <p>6.4 Power of attorney (<i>warisnama</i>)</p> <p>6.5 Petition (application)</p> <p>6.6 Letter of agreement</p> <p>6.7 Deed of will (<i>bakaspatra</i>)</p> <p>6.8 Contract paper</p> <p>6.9 Sale deed (<i>rajinama</i>)</p>	16

7.	Introduction to Criminal Law and New Forms of Crimes	<p>7.1 Meaning and types of crime</p> <p>7.2 Nature and principles of criminal law</p> <p>7.3 Elements of crime</p> <p>7.4 New forms of crime in Nepal</p> <p>7.4.1 Organized crime: drug trafficking, human trafficking, money laundering, smuggling, arms trafficking</p> <p>7.4.2 Cyber-crime: cyber-crime committed in cyber space, cyber bullying, defamation, phishing, spoofing, online fraud, cyber terrorism, cyber warfare, cyber theft-credit and debit card fraud, account hack, money transfer, unauthorized use, child pornography, racial hatred information sharing etc.</p> <p>7.4.3 New forms of sexual offense: marital rape, sexual harassment, crime against women (<i>chhaupadi pratha</i>), allegation against witchcraft.</p>	10
8.	Criminal Investigation and Prosecution system in Nepal	<p>8.1 Investigation system in Nepal: FIR and preliminary report, protection of informant, field/situation report, due process of law. submission of case file by the investigating authority to the Government Attorney Office</p> <p>8.2 The prosecution system in Nepal: criminal procedure, effective prosecution, powers, functions and autonomy of prosecutors.</p>	10
9.	Jurisdiction of Courts and Quasi-Judicial Bodies in Nepal	<p>9.1 Jurisdiction of district court, high court, supreme court, special court</p> <p>9.2 Function, procedures and jurisdiction of quasi-judicial bodies.</p>	12
		Total	120

5. Practical Activities

Practical is integral part of Secondary Education Curriculum. It focuses more on skill development than knowledge building. It consists of project work, group work, presentation, observation, internship etc. Total of 40 hours has been designated to practical activities and will be carried out under the guidance and monitoring of teacher. Following are only sample practical activities, teacher can assign any relevant practical activity as per requirement.

5.1 Grade 11

Unit	Content Area	Activities	Working Hours
1.	Law and Society	2.1 Visit a nearby police office, government attorney office or court and talk to the personnel there on how they exercise the coercive power of law. Make a short report and present in the classroom. Collect the information from other sources if the visit to the offices is not possible.	6
2.	Functions of Law in Society	3.1 Observe the formal control assured by law in heterogeneous society at the nearest city area, prepare a short report and present in the classroom.	4
3.	Autonomy of law and legal system	4.1 Collect printed or electronic form of the constitution, statutes, <i>Muluki</i> Civil and Criminal Codes of Nepal and verdicts of courts and organize a discussion programme on autonomy of law & legal system.	4
4.	Structure of Law in Nepal	5.1 Visit the office of a municipality and /or a village body. Study the public and private law/s they are practicing. Write a short note showing the difference between them.	4
5.	Principles of Civil Law Civil Rights in Nepal	6.1 Visit the houses of indigenous peoples, oppressed class, backward class, marginalized people, Dalits and senior citizens and people with disabilities. Observe their living condition and write a brief report on how their rights are protected by laws.	4
6.	Sanctity of Natural Person and Law Relating to Natural Person	7.1 Listen to the preaching of a spiritual leader. Observe the behavior of good teachers as well as ordinary people in the surrounding. Make a brief note and present in the classroom.	4
7.	Rule of law and Separation of Powers	8.1 Write an essay with arguments in favor of no one is above the law of the country.	4
8.	Dispute settlement mechanism: Formal Court System and Alternative Dispute Resolution.	9.1 Perform role play/simulation of solving any issue in group (about the damage of crops of other persons by domestic animals) by means of ADR (mediation, family courts, conciliation and arbitration). 9.2 Observe a dispute settlement at the office of municipality/village body. If possible, visit a nearby court as well. Find how the dispute is	10

		settled by the local body. Ask some community leaders how such disputes used to be solved in the past in the community. Write a case study report on the judicial, quasi-judicial and traditional and community based mechanism and processes of dispute settlement.	
Total			40

Note: Each student should maintain a file to keep all the records of the practical activities. For the internal assessment, the same is to be taken as the reference.

5.2 Grade 12

S. N.	Content Area	Activities	Working hours
1.	Nature Theory and Classification of Rights	1.1 Explain orally and in written form about category of rights, for instance, Human Rights, Fundamental rights and Legal Rights	2
2.	Enforcement of Fundamental Rights in Nepal	2.1 Write briefly on the problems of enforcement of right to housing, right to employment, protection of crime victim, right of senior citizen and children in Nepal	2
3.	Law and Property, Law in Nepal	3.1 Visit the private land of individuals, government land, public land of your community and write a report on how the land is managed and utilized. Write a report relating to the laws of land management and land use in Nepal.	4
4.	Law Relating to Intellectual Property	4.1 Prepare for a speech on the importance and present situation of intellectual property right in Nepal. Organize a speech competition in your class.	4
5.	Laws Relating to Transaction and Secured Transaction	5.1 Prepare the list of deeds required to register for legal validity. Prepare the matters to be set out in the deed according to the nature of transaction (for instance, name, surname, reason of transaction, volume of transaction etc.)	4
6.	General Introduction to legal Deeds and Drafting of Deeds	6.1 Prepare First Information Report (FIR), 6.2 Prepare Power of Attorney (warisnama), 6.3 Prepare Agreement Letter (employment agreement, house rent agreement, land lease agreement) 6.4 Prepare deed of will (<i>bakaspatra</i>)	10

		6.5 Prepare sale of land or house deed (<i>rajinama</i>) 6.6 Write writ petition	
7.	Introduction to Criminal Law and New Form of Crimes	7.1 Collect news from appropriate sources of sexual harassment in work place or public places and vehicles 7.2 Provide some examples of allegation against witch like Radha Chaudhary, aged 18 who was being repeatedly thrashed at <i>Ghodaghodi</i> (March 8, 2018), <i>Chhaupadi pratha</i> and allegation against such crime) 7.3 Collect examples of cyber-crime	4
8.	Criminal Investigation and Prosecution System in Nepal	8.1 Prepare Charge sheet 8.2 Prepare Field/situation Report (<i>Muchulka</i>). 8.3 Prepare case file	6
9.	Jurisdiction of Courts and Quasi- Judicial Bodies in Nepal	9.1 Mention the quasi-judicial bodies by visiting the field 9.2 Write the major jurisdiction of courts	4
Total			40

Note: Each student should maintain a file to keep all the records of the project/practical activities. For the internal assessment, the same is to be taken as the reference

6. Learning Facilitation Method and Process

The teacher shall use appropriate methods and techniques for facilitating learning on the part of the students. The selection of methods and techniques depends on the learning objectives, subject matter, class size, and classroom facilities and so on. Some methods and techniques appropriate for delivering the course could be:

- Socratic method
- Question & answer
- Group/individual work
- Discussion
- Problem solving
- Demonstration
- Observation
- Project method
- Field visit
- Case method
- Inquiry

- Collaborative learning
- Interactive lecture
- Role play and simulation
- Seminar
- Clinical method

7. Student Assessment Method and Process

Assessment is an important aspect of teaching learning process which serves two purposes: assessment of learning and assessment for learning. Both formative and summative evaluation will be carried out to measure the student's learning. Formative assessment is mainly to bring improvement in students' learning and it is to be done on continuous basis. The following strategies could be used for the formative assessment.

- Assessment of students' everyday learning through appropriate technique like question answer, home work.
- Presentation of assignments by the students.
- Students' participation in discussion and other class tasks.
- Project work completion.
- Weekly, monthly and trimester tests.

Summative assessment will be done through internal and external evaluation.

a. Internal Evaluation

The internal evaluation carries 25% of weightage for final evaluation of student achievement. The internal assessment consists of different aspects as shown in the table below.

S. N.	Criteria	Marks
1	Classroom participation (daily attendance, home assignment and class work, participation in activities)	3
2	Trimester exam (3 marks from each trimester exam)	6
3	Project/practical works, reports and presentation, viva	16
Total		25

b. External Evaluation

The external evaluation of the students' learning will carry 75% weightage and will be based on written examination. The types and number of question will be as per the test specification chart developed by the Curriculum Development Centre.

Finance

Grade: 11 and 12

Subject Code: Fin. 417 (Grade 11), Fin. 418 (Grade 12)

Credit Hour: 5

Annual Working hours: 160

1. Introduction

Business finance is an important area of study which incorporates the fundamental aspects of economy. Finance at its origin, concerned with financial instruments and institutions only, has now been expanded to the areas like mathematics, statistics, working capital management, investment decision, financial analysis, risk, insurance, and international finance. Moreover, increased globalization and technology are dramatically transforming financial services and markets. Nowadays, there are growing concerns on financial issues such as growth and development of economy, rise and fall of stock markets, dividends, project budgets, imports, exports, ethical issues and so on.

This curriculum aims at presenting the basic financial literacy and fundamental principles of finance that facilitates in financial decisions in a simpler and lucid manner. This course contains basic contents of business finance and brings together some theoretical and practical perspectives. Hence, it is important to those who wish to enter the job market or continue their studies at university level.

Basic finance has been offered as one of the optional subjects in both Grades 11 and 12 according to the national curriculum framework. Along with level-wise competencies, grade-wise leaning outcomes and scope and sequence of contents, suggested practical/project activities, learning facilitation process and assessment strategies have been incorporated in the curriculum.

2. Level-wise Competencies

On completion of Grade 11 and 12, the students will build up the following competencies.

1. Describe meaning and functions of business finance
2. Explain different financial instruments used to mobilize financial resources
3. Identify and describe the role of financial institutions and financial markets
4. Develop basic understanding and skills on investing in primary market, trading in secondary market and using banking transactions
5. Explain the functions of micro finance and cooperatives and their transactions process
6. Describe the principles, types and procedures of insurance
7. Explain the functions of mutual fund
8. Calculate the interest rate, present value, future value of cash flows and the value of bond and common stock
9. Analyze financial statements
10. Identify the sources of fund with their features, advantages and disadvantages
11. Compute payback period and net present value
12. Describe working capital and its importance

13. Demonstrate the understanding of exchange rate quotation and compute the cross rate.

3. Grade-wise Learning Outcomes

3.1 Learning outcomes (Grade 11)

S. N.	Content Domain/area	Learning Outcomes
1	Introduction to Business Finance	1.1 Describe the meaning of business finance. 1.2 Explain the finance functions. 1.3 Describe the goal of a firm. 1.4 Identify finance functions in organization structure.
2	Business Entity and Financial Environment	2.1 List out key features of sole proprietorship, partnership, company. 2.2 Differentiate company from sole proprietorship and partnership. 2.3 Describe the financial environment. 2.4 Explain various types of financial institutions. 2.5 Describe the role of financial institutions.
3	Financial Assets	3.1 Explain various types of financial assets. 3.2 Distinguish between financial assets and real assets. 3.3 Differentiate ownership versus creditorship; fixed versus variable; and long-term versus short-term financial assets. 3.4 Describe different types of short-term and long-term instruments.
4	Financial Markets	4.1 Explain the concept, types and roles of financial markets. 4.2 Identify the differences between primary market and secondary market. 4.3 Identify the differences between money market and capital market. 4.4 Explain the meaning of organized securities, exchanges and over-the-counter market. 4.5 Write the meaning of IPO, FPO and rights offering. 4.6 Describe the process of buying and selling securities in secondary markets. 4.7 Explain the stock market quotations. 4.8 Describe the functions of NEPSE and SEBON.
5	Commercial Banks	5.1 Explain the meaning, types and functions of banks.

		<p>5.2 Describe types of accounts/ deposits.</p> <p>5.3 Classify the bank loans/ credits in various categories.</p> <p>5.4 Explain the innovations in banking technology.</p> <p>5.5 Explain the meaning and functions of Nepal Rastra Bank.</p> <p>5.6 Describe the various classes of financial institutions by NRB.</p>
6	Micro Finance and Cooperatives	<p>6.1 Explain the concept, importance and functions of micro finance.</p> <p>6.2 Differentiate between banks and micro finance.</p> <p>6.3 Explain the meaning and types of cooperatives.</p> <p>6.4 Differentiate between micro finance and saving credit cooperatives.</p>
7	Risk and Insurance	<p>7.1 Describe the meaning of risk and classify its types.</p> <p>7.2 Explain the meaning and objectives of risk management.</p> <p>7.3 Explain the meaning and identify basic characteristics of insurance.</p> <p>7.4 Describe the evolution, functions and types of insurance.</p> <p>7.5 Appreciate the benefits of insurance.</p> <p>7.6 Identify the nature of insurable risk.</p> <p>7.7 Understand fundamental legal principles of insurance.</p> <p>7.8 Explain the features of insurance contract.</p> <p>7.9 Understand the meaning and objectives of reinsurance.</p> <p>7.10 Describe the methods of reinsurance.</p> <p>7.11 Describe the role of Nepal insurance board.</p>
8	Life and non-life Insurance	<p>8.1 Explain the concept and importance of life insurance and non-life insurance.</p> <p>8.2 Explain the types of life insurance and non-life insurance.</p> <p>8.3 Identify and explain the basic elements of life insurance contract.</p> <p>8.4 Explain the procedures of affecting life insurance policy.</p> <p>8.5 Calculate life insurance premium.</p>

		8.6 Describe the concept of micro insurance.
9	Mutual Fund, Pension Fund and other Financial Service Companies	<p>9.1 Describe the concept, advantages and drawbacks of mutual fund.</p> <p>9.2 Calculate net asset value (NAV) of mutual fund.</p> <p>9.3 Distinguish between open- and closed-end funds.</p> <p>9.4 Explain the growth of different types of mutual funds in Nepal.</p> <p>9.5 Describe the role of pension fund companies and their prospect.</p> <p>9.6 Describe the meaning and functions of merchant bankers.</p> <p>9.7 Describe the meaning and importance of credit rating agency, Deposit and Credit Guarantee Corporation, Credit Information Bureau.</p>
10	Time value of money	<p>10.1 Explain the concept of time value of money.</p> <p>10.2 Use the cash flow time line to represent cash flows occurred in different time period.</p> <p>10.3 Explain the types of cash flows.</p> <p>10.4 Calculate the present and future value of a present sum of money.</p> <p>10.5 Explain the meaning of annuity cash flows.</p> <p>10.6 Calculate the future value and present value of annuity cash flows.</p> <p>10.7 Calculate the present value of perpetuity.</p> <p>10.8 Calculate the present value and future value of uneven cash flows stream.</p> <p>10.9 Compare nominal and effective rate.</p> <p>10.10 Prepare amortization schedule for amortized term loan.</p>

3.2 Learning Outcomes (Grade 12)

S. N.	Content Domain/Area	Learning Outcomes
1	Introduction to Business Finance	<p>1.1 Describe the concept and meaning of business finance.</p> <p>1.2 Explain the relationship of finance with economics and accountancy.</p> <p>1.3 Describe the responsibilities of a financial manager.</p> <p>1.4 Explain the ethical issues in financial decision.</p>
2	Financial Statements	2.1 Describe the basic concepts of financial statements.

	and Reporting	<p>2.2 Identify and apply the contents of balance sheet.</p> <p>2.3 Describe the contents of income and cash flow statement.</p> <p>2.4 Identify the contents of statement of changes in equity structure.</p> <p>2.5 Explain note to accounts.</p> <p>2.6 Describe the common size statements.</p> <p>2.7 Describe annual report.</p>
3	Financial Analysis	<p>3.1 Describe the importance of ratio analysis.</p> <p>3.2 Compute and interpret the Liquidity ratios.</p> <p>3.3 Compute and interpret the Asset Management ratios and the Debt Management ratios.</p> <p>3.4 Compute and interpret the profitability ratios and the market value ratios.</p> <p>3.5 Describe the DuPont equation.</p>
4	Source of Fund	<p>4.1 Describe the concept and features of common stock, preferred stock and debt.</p> <p>4.2 Explain the advantages and disadvantages of common stock, preferred stock and debt.</p>
5	Capital Structure	<p>5.1 Describe capital structure and financial structure.</p> <p>5.2 Acquire the knowledge of optimal capital structure.</p> <p>5.3 Describe the factors affecting capital structure decisions.</p> <p>5.4 Identify the business risk and financial risk.</p> <p>5.5 Explain Break-even Analysis and compute operating BEP.</p>
6	Bond and Stock Valuation	<p>6.1 Calculate the value of bond including semiannual compounding.</p> <p>6.2 Calculate book value of common stock.</p> <p>6.3 Calculate the value of common stock for finite holding periods.</p> <p>6.4 Determine the value of common stock under zero and constant dividend growth model.</p>
7	Capital Investment Decision	<p>7.1 Describe the meaning and importance of investment decision.</p> <p>7.2 Acquire the knowledge of various types of investment proposals.</p>

		7.3 Describe the steps of investment proposal evaluation techniques. 7.4 Compute the PBP and NPV.
8	Working Capital and Current Assets Management	8.1 Describe the concept, types and importance of working capital. 8.2 Explain the determinants of working capital. 8.3 Describe the concept of cash conversion cycle and compute CCC. 8.4 Understand various types of current assets. 8.5 Explain the concept and importance of cash and marketable securities management. 8.6 Explain the concept and importance of receivable management and inventory management.
9	Dividends and Dividend Payment Procedure	9.1 Describe the meaning, concept and forms of dividend. 9.2 Identify and explain the different types of dividend payout schemes. 9.3 Describe the dividend payment procedure. 9.4 Explain the factors influencing dividend decision.
10	International Finance	10.1 Describe the MNEs. 10.2 Differentiate between multinational and domestic financial management. 10.3 Acquire the knowledge of exchange rate. 10.4 Compute cross rate.

4. Scope and Sequence of Contents

Grade 11

S. N.	Content Area	Elaboration of Contents	Working Hour
1	Introduction to Business Finance	1.1 Meaning of business finance 1.2 Finance functions 1.3 Goals of the firm 1.4 Organization of finance functions	10
2	Business Entity and Financial Environment	2.1 Forms of business organization: 2.1.1 Sole proprietorship 2.1.2 Partnership 2.1.3 Company	10

		<p>2.2 Business and taxes</p> <p>2.3 Financial environment</p> <p>2.4 Financial assets</p> <p>2.5 Financial market</p> <p>2.6 Financial intermediaries: Introduction, types and role of financial institution</p> <p>2.7 Other institutions</p>	
3	Financial Assets	<p>3.1 Meaning and characteristics of financial assets</p> <p>3.2 Real vs. financial assets</p> <p>3.3 Instruments of financial assets</p> <p>3.4 Long-term vs. short-term</p> <p>3.5 Ownership vs. creditorship</p> <p>3.6 Fixed return vs. variable return instruments</p> <p>3.7 Derivatives</p> <p>3.8 Long-term instruments: Common stock, preferred stock and bonds/Debentures</p> <p>3.9 Short-term instruments: Treasury bill, bankers' acceptance, commercial paper, promissory notes, bill of exchange, letter of credit, certificate of deposits</p>	10
4	Financial Markets	<p>4.1 Concept and types of financial markets</p> <p>4.2 Primary and secondary markets</p> <p>4.3 Money and capital markets</p> <p>4.4 The secondary market: organized exchanges and over-the-counter market</p> <p>4.5 Role of financial markets</p> <p>4.6 Participation in primary markets: Initial public offering (IPO), further public offering (FPO), rights offering</p> <p>4.7 Demat account, CRN (Central-ASBA registration number) number</p> <p>4.8 Participation in secondary markets: Stock broker, dealer, market maker, know your client (KYC) form, buy and sell order, stock quotations</p> <p>4.9 Nepal Stock Exchange: Introduction and functions</p> <p>4.10 Securities Board of Nepal: Introduction and</p>	14

		functions	
5	Commercial Banks	5.1 Meaning and types of banks 5.2 Functions of bank 5.3 Services offered by commercial banks 5.4 Types of accounts (deposits) 5.5 Categories of loans (credit) 5.6 Innovations in Banking technology: 5.6.1 Online banking 5.6.2 Mobile banking 5.6.3 Internet banking 5.6.4 Swifts 5.7 Regulator of banks: Nepal Rastra Bank (NRB) 5.8 Functions of NRB 5.9 NRB classification of financial institutions: 5.9.1 Commercial bank 5.9.2 Development bank 5.9.3 Finance company 5.9.4 Micro finance	14
6	Micro Finance and Cooperatives	6.1 Concept and importance of micro finance 6.2 Functions of micro finance 6.3 Difference between banks and microfinance 6.4 Meaning and types of cooperatives 6.5 Organization of cooperatives 6.6 Difference between micro finance and saving and credit cooperatives	10
7	Risk and Insurance	7.1 Risk: Concept and types 7.2 Concept and evolution of insurance 7.3 Benefits of insurance 7.4 Nature of insurable risks 7.5 Principles of insurance 7.6 Types of insurance 7.7 Features of insurance contract 7.8 Meaning, objectives and methods of reinsurance 7.9 Regulator of insurance companies: Nepal	12

		Insurance Board	
8	Life and non-life Insurance	8.1 Concept and importance of life insurance 8.2 Elements of life insurance contract 8.3 Procedures of affecting life insurance policy 8.4 Role of agents 8.5 Computation of life insurance premium 8.6 Types of life insurance 8.7 Concept and importance of non-life insurance 8.8 Types of non-life insurance and procedures 8.9 Concept and importance of micro insurance	10
9	Mutual Fund, Pension Fund and other Financial Service Companies	9.1 Mutual funds: Concept and advantages 9.2 Net asset value (NAV) of mutual funds 9.3 Open-end and close-end mutual fund 9.4 Difference between open-end and closed-end mutual fund 9.5 Growth of mutual funds in Nepal 9.6 Concept of pension fund companies 9.7 Role of pension fund companies 9.8 Meaning and role of merchant bankers 9.9 Functions of merchant bankers 9.10 Credit rating agency, Deposit and Credit Guarantee Fund, Credit Information Bureau	10
10	Time value of money	10.1 Concept of time value of money 10.2 Meaning of compounding and discounting 10.3 Concept of cash flow 10.4 Types of cash flow 10.5 Cash flow time line 10.6 Future value and present value of single cash flow 10.7 Solving for interest rates and time period 10.8 Annuities: Meaning and types 10.9 Future value of ordinary annuity and annuity due 10.10 Present value of ordinary annuity and annuity due	20

		10.11 Solving for annuity payments, interest rates and number of periods 10.12 Present value of perpetuities 10.13 Future and present value of uneven cash flows 10.14 Semi-annual and other compounding periods 10.15 Loan installment and loan repayment schedule	
Total			120

4.2 Grade 12

S. N.	Content Area	Elaboration of Contents	Working Hours
1	Introduction to Business Finance	1.1 An overview of business finance 1.2 Relationship of finance with economics and accountancy 1.3 Roles and responsibilities of a financial manager 1.4 Ethical concerns in financial decision	10
2	Financial Statements and Reporting	2.1 Nature of financial statements 2.2 Need for financial statements 2.3 Major components of financial statements: balance sheet, income statement, cash flow statement, statement of changes in equity structure and note to accounts 2.4 Common size statements 2.5 Annual report and its major components 2.6 Users of financial statements	8
3	Financial Analysis	3.1 Uses and importance of financial ratio analysis 3.2 Concept of index analysis 3.3 Types of ratios – Liquidity (current ratio, quick ratio), turnover (inventory turnover ratio, receivable turnover ratio, fixed assets turnover ratio, total assets turnover ratio), leverage (debt ratio, debt to assets ratio, equity multiplier), profitability (net profit margin, gross profit margin, return on assets, return on equity) and market value (price-earnings ratio, market to book ratio) 3.4 Du-pont system 3.5 Limitations of ratio analysis	12
4	Source of Fund	4.1 Sources of capital/fund; on the basis of time (short term vs. long term); on the basis of ownership	15

		(debt vs. borrowed) 4.2 Short term sources: types, advantages and disadvantages 4.3 Debt: features, advantages and disadvantages 4.4 Preferred stock: features, advantages and disadvantages 4.5 Common stock: features, advantages and disadvantages	
5	Capital Structure	5.1 Capital structure and financial structure 5.2 Meaning and features of optimal capital structure 5.3 Concept of business risk and financial risk 5.4 Break-even analysis: Determining operating BEP	13
6	Bond and Stock Valuation	6.1 Meaning and key characteristics of bonds 6.2 Valuation of bonds: Perpetual bonds, zero coupon bonds, coupon bonds with finite maturity 6.3 Bonds with semiannual coupons 6.4 Meaning and key features of common stock 6.5 Book value of common stock 6.6 Common stock valuation: Single holding periods Multiple holding periods 6.7 The dividend discount model: zero growth model and constant growth model.	12
7	Capital Investment Decision	7.1 Concept, features and importance of investment decision 7.2 Types of investment proposals: Independent, dependent, mutually exclusive, expansion, diversification and replacement 7.3 Steps involved in the evaluation of investment 7.4 Payback period and net present value	16
8	Working Capital and Current Assets Management	8.1 Concept and types working capital 8.2 Importance of working capital 8.3 Determinants of working capital 8.4 Gross working capital and net working capital 8.5 Cash conversion cycle 8.6 Current assets management: concept and importance of cash management, receivables management and inventory management	14
9	Dividends and Dividend Payment Procedure	9.1 Concept and forms of dividends 9.2 Dividend payment schemes: stable, constant pay-out and low regular plus extra 9.3 Dividend payment procedure	10

		9.4 Factors influencing dividend decision	
10	International Finance	10.1 Multinational corporations 10.2 Multinational versus domestic financial management 10.3 Exchange rates and quotation 10.4 Computation of cross exchange rate 10.5 Trading in foreign exchange: Concepts of spot rates and forward rates	10
	Total		120

5 Suggested Practical/project Activities

Some examples of practical/project work activities to be performed by students of Grade 11 and Grade 12.

Grade 11							
S. N.	Content Area	Project Works	Working Hour				
1	Introduction to Business Finance	Visit any two business firms of your locality and the web page of any one organization and note their goals.	3				
2	Business Entity and Financial Environment	Visit any five business firms of your locality. List out their characteristics and classify them into the categories of sole proprietorship, partnership, company.	2				
3	Financial Assets	Select an organization of your choice and fill in the following table with reference to the selected organization. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Examples of real asset</th> <th style="text-align: center;">Examples of financial assets</th> </tr> </thead> <tbody> <tr> <td style="height: 20px;"></td> <td style="height: 20px;"></td> </tr> </tbody> </table>	Examples of real asset	Examples of financial assets			5
Examples of real asset	Examples of financial assets						
4	Financial Markets	4.1 Suppose you want to purchase shares through primary market, list out the requirements and steps to be followed while investing in primary market. 4.2 Visit a brokerage firm and collect KYC form to trade in secondary market. List out the documents required for KYC, fill in the form properly and attach required documents. 4.3 List out requirements and steps to be followed while purchasing shares in secondary market.	6				
5	Commercial Banks	5.1 Visit a branch of a commercial bank/development bank/finance company in your local area and list out the functions it performs on the basis of an interview with one of the officers of the	5				

		<p>organization.</p> <p>5.2 Visit the website of a commercial bank/development bank/finance company and list out the services offered by the institution.</p> <p>5.3 Visit a financial institution and collect the application form for opening a saving account. List out the documents required to open a saving account, fill in the form properly and attach the required documents.</p> <p>5.4 Visit websites of Nepal Rastra Bank (NRB) and list out:</p> <ul style="list-style-type: none"> - Number of commercial banks / Class A financial institutions - Number of Development banks/ Class B financial institutions - Number of finance companies/ Class C financial institutions 	
6	Micro Finance and Cooperatives	Is there any branch of micro finance and or cooperative in your locality? If yes, list out the services offered by them; then compare and contrast the functions of micro finance and saving and credit cooperative.	5
7	Risk and Insurance	Prepare a list of various types of risks and their examples.	6
8	Life and non-life Insurance	<p>8.1 Form a team of five to seven students in your class. Visit any branch (or website) of life insurance company and collect information from the company branch (or website). Conduct an interview with the manager of the company to get information about various life insurance policies offered by the company. Present a report covering the type of each policy and their features in your class in the presence of your subject teacher.</p> <p>8.2 Visit any branch of non-life insurance company in your local area (or website of non-life insurance company if branch is not accessible). Gather the information relating to various non-life insurance policies offered by them. Discuss and prepare short report on the type of risks coverage under those policies.</p>	
9	Mutual Fund, Pension Fund and other Financial Service Companies	Visit a merchant banker (or website of a merchant banker); then list out the functions and services offered by the institution.	5

10	Time value of money	List out the short-term and long-term interest rates charged by any two financial institutions on the money they lend and make a comparison showing how and why they are different.	3
	Total		40

Grade 12			Working Hour
S. N.	Content Domain/area	Activities	
1	Introduction	Visit a nearby organization in your locality and interview the manager about his/her responsibilities and the importance of finance in Nepalese organizations and prepare and present a report to the class.	1
2	Financial Statements and Reporting	Collect the daily newspaper and find out the financial statements in the business pages or annual report, then list out the items included in the balance sheet, the income statement, cash flow statement, statement of changes in equity structure and note to accounts separately.	2
3	Financial Analysis	Collect the daily newspaper and find out the financial statements in the business pages or annual report, then calculate the ratios you studied in the text separately for two firms of the same industry and compare the financial health.	4
4	Source of Fund	Visit a nearby organization in your locality and interview the manager about the sources of fund in their business. List out them on the basis of interview. Calculate the percentage of each source and write the advantages and disadvantages of them.	5
5	Capital Structure	Watch the business news in television for a month and list out the companies with the long-term source of financing. Find out the sources of long-term capital (Why are the companies interested in using those sources?)	5
6	Bond and Stock Valuation	6.1 Visit the website of a company that has issued bonds (or website of issue manager), download prospectus and list out the key features of bonds. 6.2 Calculate the value of a bond issued by any	4

		Nepalese company and justify your required rate of return.	
7	Capital Investment Decision	A mini case can be provided with the data.	6
8	Working Capital and Current Assets Management	A mini case can be provided with the data.	4
9	Dividends and Dividend Payment Procedure	Collect the newspaper for the last few days and find out the news related to the dividend distribution. If the related news is not found in newspaper, visit the website of listed companies on Nepal Stock Exchange and find out the companies that have the history of dividend payment. Collect the information from there; and list out the types of dividend and explain the dividend payment procedure.	5
10	International Finance	A real case can be exercised with the help of the exchange rates published by Nepal Rastra Bank in daily newspapers or website.	4
	Total		40

6. Learning Facilitation Method and Process

So as to facilitate the content of the course, the teacher will use a variety of student centered methods and strategies so that they will develop the habit of independent learning. Besides other subject specific methods, the following and methods and techniques could be employed in delivering the course.

- Case observation
- Field visit
- Library assignment
- Project work
- Group and individual work
- Presentation
- Lecture and discussion

7. Student Assessment

Assessment is an important aspect of teaching learning process which will both serve the purpose of assessment for learning and assessment of learning. Both formative and summative evaluation will be carried out to measure the students' learning. Formative assessment is mainly to bring improvement in students' learning and it is to be carried out in the continuous basis. The following strategies are to be utilized for the formative assessment.

- Assessment of students' everyday learning
- Presentation of home assignments by the students
- Students' participation in discussions
- Project work completion
- Weekly, Monthly and trimester tests

Summative assessment will be carried out through internal and external evaluation.

A. Internal Evaluation

Student's knowledge, skills and competencies will be measured through internal evaluation in both the Grades 11 and 12. As an internal evaluation, two trimester examinations will be conducted. The internal evaluation carries 25 percent of weightage for final evaluation of student achievement. The following table shows the criteria for the internal evaluation:

SN	Criteria	Marks
1	Classroom participation (Daily attendance, home assignment, classwork, individual, group and class participation in learning, participation in academic and other activities)	3
2	Trimester exam (3 marks from each trimester exam)	6
3	Project work, project report and presentation	16
	Total	25

B. External examination

External evaluation of the students will be based on the written examination. It carries 75 percent of the total weightage. The types and number questions will be as per the test specification chart developed by the Curriculum Development Centre.

बौद्ध अध्ययन

कक्षा : ११ र १२

विषय सङ्केत : [BUD. 421] (कक्षा ११), [BUD. 422] (कक्षा १२)

पाठ्यघण्टा : ५

वार्षिक कार्यघण्टा : १६०

१. परिचय

बुद्धको जीवन यात्रा, बुद्ध वचन र बौद्ध दर्शन विश्वभर प्रसिद्ध र स्थापित छन् । यिनै विषयक्षेत्रमा आधारित शिक्षा प्रणालीले पनि राष्ट्रिय तथा अन्तर्राष्ट्रिय रूपमा लोकप्रियता र निरन्तरता पाइराखेका छन् । यस शिक्षा प्रणालीको परम्परागत मौलिक अभ्यास, नवीनतम अभ्यास र सन्दर्भ तथा सर्वव्यापकतालाई समेत आधार बनाई राष्ट्रिय पाठ्यक्रम प्रारूप, २०७६ को मार्गदर्शनबमोजिम विद्यालय शिक्षाको माध्यमिक तह (कक्षा ११ र १२) मा बौद्ध अध्ययन विषयको पाठ्यक्रम निर्माण गरिएको हो । यस पाठ्यक्रममा तल्लो तहमा प्राप्त गरेका विविध विषयका विषयवस्तुगत ज्ञान तथा सिप र क्रियात्मक अनुभवहरूलाई समेट्दै स्वाध्ययनको पूर्वाधारका लागि आवश्यक विषयवस्तुहरू समावेश गरिएका छन् । पाठ्यक्रमलाई समयसापेक्ष, व्यावहारिक र सक्षमतामा आधारित बनाउन सान्दर्भिक पाठ्यवस्तुको छनोट र स्तरीकरण गरिएको छ । विद्यार्थीको संज्ञानात्मक क्षमता, स्तर र समसामयिक सन्दर्भ जस्ता पक्षमा जोड दिई विकास गरिएको यस पाठ्यक्रमले विद्यार्थीमा बुद्ध र बुद्ध धर्मदर्शनसम्बन्धी सैद्धान्तिक र व्यावहारिक ज्ञान विकास गर्ने छ । यसका साथै यस पाठ्यक्रमले सम्बन्धित विषयमा उच्च शिक्षाको आधारसमेत तयार गर्ने छ ।

यस पाठ्यक्रममा बुद्धको जीवन यात्रा, लुम्बिनी उद्यान, आधारभूत बुद्ध शिक्षा, बुद्ध र व्यक्तित्व रूपान्तरण, बुद्ध र प्रकृति, बुद्ध र समाज सुधार, बौद्ध प्रतीकको प्रयोग र अर्थ, बुद्धको महापरिनिर्माण पश्चात् बौद्ध धर्मको विकास, बौद्ध सङ्घ जस्ता विषयवस्तु समावेश गरिएको छ । त्यसै गरी यस पाठ्यक्रममा बुद्ध र लैङ्गिक समता तथा बौद्ध दृष्टिमा जीव र जगत, विश्वका प्रसिद्ध व्यक्तित्वहरूमा बुद्धको प्रभाव, प्रसिद्ध बुद्ध वचन, नेपालको बौद्ध सम्पदा जस्ता विषयवस्तु समेटिएको छ । उल्लिखित विषयवस्तु समेटिएको यस विषयको पाठ्यक्रमबाट विद्यार्थीमा बुद्ध र बुद्ध धर्मदर्शनसम्बन्धी विशेष ज्ञान हासिल हुने छ ।

यस पाठ्यक्रममा परिचय, तहगत सक्षमता, कक्षाकगत सिकाइ उपलब्धि, विषयवस्तुको क्षेत्र र क्रम, सिकाइ सहजीकरण प्रक्रिया र विद्यार्थी मूल्याङ्कनलाई समेटिएको छ । यस क्रममा पाठ्यक्रम विकासको विषयगत औचित्य, पाठ्यक्रममा रहेका मुख्य विशेषता तथा पाठ्यक्रमको स्वरूपलाई समेटेरी परिचय, विषयगत रूपमा अपेक्षित ज्ञान, सिप, अभिवृत्ति, मूल्य र कार्य तत्परतालाई समेटेरी त्यसको क्रियात्मक स्वरूपमा सक्षमता, सिकाइको स्तर र सक्षमताको विशिष्टीकृत विस्तृतीकरण गरी सिकाइ उपलब्धि, सक्षमता, सिकाइ उपलब्धि एवम् अघिल्ला कक्षासँग लम्बीय सन्तुलनका आधारमा विषयवस्तुको क्षेत्र र क्रम, विषयगत विशिष्टपन र मौलिकतालाई समेटेरी सिकाइ सहजीकरणका विधि तथा प्रक्रिया समावेश गरिएको छ । यसमा विद्यार्थीको निर्माणात्मक र निर्णयात्मक मूल्याङ्कनका विधि तथा प्रक्रिया उल्लेख गरी विद्यार्थी मूल्याङ्कनलाई व्यवस्थित गरिएको छ ।

२. तहगत सक्षमता

माध्यमिक तह कक्षा ११ र १२ मा बौद्ध अध्ययन विषयको अध्ययन पूरा गरेपछि विद्यार्थीहरू निम्नलिखित कार्य गर्न सक्षम हुने छन्:

१. बुद्धको जीवन यात्रा र राजकुमार सिद्धार्थको करुणामयी स्वभावको बोध तथा अनुसरण
२. लुम्बिनी उद्यान र आधारभूत बुद्ध शिक्षा सम्बद्ध विषयवस्तुको विश्लेषण र अभिव्यक्ति
३. बौद्ध दर्शनका मुख्य मूल्यमान्यताहरूको जानकारी र अवलम्बन
४. व्यक्तिगत तथा सामाजिक रूपान्तरणका लागि बुद्ध र बौद्ध दर्शनको अवलम्बन
५. नेपालको बौद्ध सम्पदाको संरक्षण, प्रवर्धन र विकासमा योगदान
६. बौद्ध संस्कृति र परम्परा संरक्षण र जगेर्नामा सहयोग तथा सहभागिता

७. बुद्धको महापरिनिर्वाण पश्चात् बौद्ध परम्पराको विकासको बोध र निरन्तरताका लागि सहयोग
८. बौद्ध सङ्घका बारेमा जानकारी हासिल गरी बौद्ध कला र संस्कृतिको विकास र संवर्धनप्रति अग्रसरता
९. मानव जीवनका विशेष मूल्यमान्यता पहिचान र तदनुरूप व्यवहार प्रदर्शन

३. कक्षागत सिकाइ उपलब्धि

कक्षा ११

माध्यमिक तह कक्षा ११ मा बौद्ध अध्ययन विषयको अध्ययन पूरा गरेपछि विद्यार्थीहरू निम्नलिखित कार्यहरू गर्न सक्षम हुने छन् :

१. जन्म, चार निमित्त दृश्य, गृहत्याग र बुद्धत्व प्राप्तमा आधारित भई बुद्धको जीवन यात्रा बताउन
२. पहिलो धर्मचक्र प्रवर्तन तथा सङ्घ निर्माण र महापरिनिर्माणका विषयवस्तु बोध तथा अभिव्यक्त गर्न
३. बौद्ध ग्रन्थ निदान कथा र ललितविस्तरको प्रस्तुति गर्न
४. लुम्बिनी उद्यानमा रहेका धार्मिक, सांस्कृतिक तथा पुरातात्विक विषयवस्तुको वर्णन गर्न
५. विभिन्न बुद्ध, प्रमुख श्रावक/श्राविका, आर्य स्थविर/स्थविरा र बुद्धका प्रमुख गृहस्थ अनुयायीहरूका मुख्य मुख्य कार्य बताउन
६. राजहंसको कथाका विषयवस्तुको बोध गरी धारणा विकास र प्रस्तुति गर्न
७. पञ्चशीलका विषयक्षेत्र बोध गरी तदनुरूप व्यवहार प्रदर्शन गर्न
८. समथा ध्यानसम्बद्ध विषयवस्तु ज्ञान गरी वर्णन गर्न
९. बुद्धकालीन तथा महापरिनिर्माणपश्चात् बुद्धको शिक्षा ग्रहण गरी रूपान्तरण भएका व्यक्तित्वहरूको जीवनी बताउन
१०. बुद्धको जीवनमा प्रकृतिसँगको सम्बन्ध पहिचान गरी प्रकृतिसम्बन्धी बुद्धको शिक्षा बताउन
११. बुद्धकालीन समाजका बारेमा छोटकरीमा वर्णन गर्न
१२. सबै खाले भेदभाव विरुद्ध बुद्धले लिएको नीति र कार्य प्रस्तुत गर्न
१३. बौद्ध संस्कृतिमा प्रतीकको प्रयोग र अर्थ बोध गरी बौद्ध संस्कार र संस्कृतिको वर्णन गर्न

कक्षा १२

माध्यमिक तह कक्षा १२ मा बौद्ध अध्ययन विषयको अध्ययन पूरा गरेपछि विद्यार्थीहरू निम्नलिखित कार्यहरू गर्न सक्षम हुने छन् :

१. राष्ट्रिय तथा अन्तर्राष्ट्रिय रूपमा ख्याति प्राप्त व्यक्तित्वहरू विचारमा आधारित भई बुद्धको व्यक्तित्व विश्लेषण गर्न
२. बुद्धका प्रेरणादायी वचनहरूको सूची निर्माण गरी प्रस्तुत गर्न
३. गोटिहवा, निगिलहवा र लुम्बिनीसँग सम्बन्धित बौद्ध इतिहास पहिचान र वर्णन गर्न
४. प्रसिद्ध बौद्ध गुरुहरूको जीवनी बताउन
५. प्रसिद्ध बौद्धस्थलहरूको भौगोलिक र सांस्कृतिक महत्त्व बताउन
६. सम्यक् महादान, मच्छेन्द्रनाथ जात्रा, सागादावालगायतका बौद्ध चाडपर्वहरूका बारेमा सङ्क्षेपमा वर्णन गर्न
७. बुद्धको अस्थिधातुको विभाजन तथा धातु स्तुप निर्माणसम्बन्धी प्रसङ्ग उल्लेख गर्न

८. सङ्घ भेला र बौद्ध संस्कृति विस्तारमा यसको योगदान बताउन
९. बौद्ध सङ्घको संरचना, नियम र काम कर्तव्य बताउन
१०. लैङ्गिक सवालमा बुद्धको धारणा विश्लेषण गर्न
११. पञ्चस्कन्धमा आधारित भई व्यक्तित्व निर्माणसम्बन्धी बुद्धको धारणा प्रस्तुत गर्न
१२. चारमहाभूत, त्रिलक्षण र प्रतीत्यसमुत्पादका मुख्य मुख्य विषयवस्तु पहिचान गरी प्रस्तुत गर्न
१३. ध्यानका विभिन्न पक्ष र अभ्यासगत प्रक्रिया बोध गरी आधारभूत रूपमा अभ्यास गर्न

४. विषयवस्तुको क्षेत्र र क्रम

कक्षा ११

कक्षा ११			कक्षा १२		
विषयक्षेत्र	विषयवस्तु र यसको विस्तृतीकरण	पाठ्य घण्टा	विषयक्षेत्र	विषयवस्तु र यसको विस्तृतीकरण	पाठ्य घण्टा
बुद्धको जीवन यात्रा	१.१ जन्म १.२ राजहंसको कथा १.३ चार निमित्त दृश्यहरू १.४ गृहत्याग १.५ बुद्धत्व प्राप्ति १.६ प्रथम धर्मचक्र प्रवर्तन तथा सङ्घ निर्माण १.७ महापरिनिर्वाण १.८ बुद्धको अस्थिधातुको विभाजन		विश्वका प्रसिद्ध व्यक्तित्वहरूमा बुद्धको प्रभाव	१.१ सामाजिक अभियन्ता तथा मानव अधिकारकर्मी : डा. भीमराव अम्बेदकर १.२ वैज्ञानिक अल्बर्ट : आइन्स्टाइन १.३ गरिबी निवारण अभियानकर्ता : ए.टी. आर्यरत्न १.४ अर्थशास्त्री : डू एफ सुमाय्कर १.५ विपश्यनाचार्य : सत्यनारायण गोयन्का १.६ सर्जकहरू (कलाकार : रिचर्ड गेर)	
लुम्बिनी उद्यान	२.१ बौद्ध ग्रन्थहरू : निदान कथा र ललितविस्तरमा वर्णन २.२ चिनियाँ यात्रुहरूको वर्णन २.३ सम्राट् अशोकको अभिलेखसहितको शिलास्तम्भ २.४ बुद्धजन्मस्थलमा रहेको मूर्ति २.५ पुरातात्विक उत्खननहरूमा जनरल		प्रसिद्ध बुद्ध वचन	२.१ अङ्गुत्तरनिकाय ३:६५, धम्मपद १ : ५ र १५ ३:३७ र ४२ ६:८१, ८ १४:१८३, १५:२०४, १७:२२३ १८ २३९र २४६	

	खड्गशमशेर, फुरर, देवलामित्र, जापान बुद्धिस्ट फाउन्डेसन तथा डुहाम विश्वविद्यालयको योगदान				
आधारभूत बुद्ध शिक्षा	<ul style="list-style-type: none"> ३.१. पञ्चशील ३.१.१ हिंसा नगर्नु ३.१.२ चोरी नगर्नु ३.१.३ व्यवहार नगर्नु ३.१.४ भुटो नबोल्नु ३.१.५ नसालु पदार्थको सेवन नगर्नु ३.२. समथ ध्यान ३.३ प्रज्ञा ३.३.१ चार आर्य सत्य र आर्य अष्टाङ्गिक मार्ग ३.३.२ प्रतीत्यसमुत्पाद (कार्यकारणको सिद्धान्त) ३.३.३ कर्म र कर्मफलको सिद्धान्त 		नेपालको बौद्ध सम्पदा	<ul style="list-style-type: none"> ३.१. बुद्धहरूको जन्मभूमि नेपाल ३.१.१ गोटीहवा ३.१.२ निगलहवा ३.१.३ लुम्बिनी ३.२. नेपालानका प्रमुख बौद्ध गुरुहरू ३.२.१ प्रजापति गौतमी ३.२.२ बुद्धभद्र ३.३.३ शान्तिकर ३.३.४ शील मन्जु ३.३.५ बन्धुदत्त ३.३. नेपालका प्रमुख बौद्ध स्थलहरू ३.३.१ स्वयम्भू ३.३.२ बौद्ध ३.३.३ नमोबुद्ध (काभ्रे) ३.३.४ कपिलवस्तु ३.३.५ रामग्राम ३.४ बौद्ध चाडपर्वहरू ३.२ बुद्ध जयन्ती (बैशाख पूर्णिमा) सम्यक् महादान ३.४.२ पञ्चदान ३.४.३ कठिन दान ३.४.५ मच्छेन्द्रनाथ जात्रा ३.४.६ सागादावा 	
बुद्ध र व्यक्तित्व रूपान्तरण	<ul style="list-style-type: none"> ४.१. दश सुचरित्र (दश कुशल) र दश दुष्चरित्र (दश अकुशल) ४.१.१ शरीरबाट तीनओटा कुशल र अकुशल ४.१.२ वचनबाट चारओटा कुशल र अकुशल 		बुद्धको महापरिनिर्वाण पश्चात् बौद्ध धर्मको विकास	<ul style="list-style-type: none"> ४.१ बुद्धको अस्थिधातुको विभाजन तथा धातु स्तूप निर्माण ४.२ प्रथम सङ्घ भेला (सङ्गीति) र त्यसको उपलब्धि : बुद्ध वचन सङ्ग्रह ४.३ द्वितीय सङ्घ भेला 	

	<p>४.१.३ मनबाट तीनओटा कुशल र अकुशल</p> <p>४.२. इतिहासको विभिन्न कालखण्डमा बुद्धको शिक्षा ग्रहण गरी रूपान्तरण भएका व्यक्तित्वहरू (बुद्धकालीन)</p> <p>४.२.१ यशकुमार</p> <p>४.२.२ सारिपुत्र तथा मौद्गल्यान</p> <p>४.३.२ अङ्गुलिमाल</p> <p>४.३.३ पटाचारा</p> <p>४.३. बुद्धको महापरिनिर्वाणपश्चात्</p> <p>४.३.१ सम्राट् अशोक</p> <p>४.३.२ राजा मिलिन्द</p>			<p>(सङ्गीति) र त्यसका उपलब्धि : दुई वादमा विभाजन, कालान्तरमा १८ निकायको विकास</p> <p>४.४ तृतीय सङ्घ भेला (सङ्गीति) र त्यसको उपलब्धि : अभिधम्मको विकास तथा विभिन्न देशहरूमा धर्मदूतमार्फत बुद्धधर्मको विस्तार</p>	
बुद्ध र प्रकृति	<p>५.१. बुद्धको जीवन र प्रकृति</p> <p>५.१.१ लुम्बिनी उद्यानमा जन्म</p> <p>५.१.२ बोधगयामा बोधीवृक्षमुनि बुद्धत्व प्राप्ति</p> <p>५.१.३ सारनाथको मृगदावनमा पहिलो धर्मचक्र प्रवर्तन</p> <p>५.१.४ कुशीनगरमा महापरिनिर्वाण</p> <p>५.२. विभिन्न वनमा रहेका आवासीय विहारहरू : भेलुवन, आम्रवन</p> <p>५.३. प्रकृतिसम्बन्धी बुद्धको शिक्षा</p> <p>५.३.१ संयुक्त निकायको वनरोप सुत्त</p> <p>५.३.२ चुल्लवग्ग पालीको सेनासनक्खण्डक</p> <p>५.३.३ भिक्खुणी पातिमोक्खा</p> <p>५.३.४ चुल्लवग्ग पालीको खुड्डक वत्थुक्खण्डक जातक कथाहरू : कुसनाली र तच्चसुकर</p>		बौद्ध सङ्घ	<p>५.१ सङ्घको संरचना</p> <p>५.२ सङ्घ नियम</p> <p>५.३ सङ्घको काम कर्तव्य</p>	
बुद्ध र समाज	<p>६.१. बुद्धकालीन समाजको परिचय</p> <p>६.२. बुद्धकालीन समाजको</p>		बुद्ध र लैङ्गिक	<p>६.१ कौशल नरेशसँगको सन्दर्भ</p>	

सुधार	विभेदपूर्ण अवस्थाको चित्रण (वर्ण, जातीय, वर्ग, लैङ्गिक) ६.२.१ उपाली (हजाम) ६.२.२ सुनीत (कुचीकार) ६.२.३ सोपाक (अछुत) ६.२.४ सुमङ्गल (तल्लो जात) ६.२.५ सुप्रबुद्ध (कुष्ठरोगी) ६.२.५ विशाखा (महिला) ६.२.६ अङ्गुलिमाल (हिंसक अपराधी) ६.२.७ अम्बपाली (गणिका)		समता	६.२ महिलाहरूलाई सङ्घमा प्रवेश	
बौद्ध प्रतीकको प्रयोग र अर्थ	७.१ धर्मचक्र ७.२ अष्टमङ्गल ७.३ वज्र र घण्टा ७.४ मणि ७.५ बौद्ध झन्डा ७.६ कमलको फूल ७.७ बोधिवृक्ष		बौद्ध दृष्टिमा जीव र जगत्	७.१ मानवीय व्यक्तित्वसम्बन्धी बुद्धको दृष्टिकोण ७.१.१ नाम रूपको सम्मुच्च ७.१.२ पञ्चस्कन्ध (रूप, वेदना, संज्ञा, संस्कार र विज्ञान) ७.२ जीव र जगत्को स्वभाव ७.२.१ चारमहाभूत ७.२.२ प्रतीत्यसमुत्पाद ७.२.३ त्रिलक्षण (अनित्य, दुःख, अनात्म) ७.२.४ कर्मफल ७.३ चतुर्ब्रह्मविहार ७.३.१ मैत्री ७.३.२ करुणा ७.३.३ मुदिता ७.३.४ उपेक्षा ७.४ षट्पारमिता ७.४.१ दान ७.४.१ शील ७.४.२ क्षान्ति ७.४.३ वीर्य ७.४.४ ध्यान ७.४.५ प्रज्ञा	

				७.५. ध्यान ७.५.१ विपश्यना	
जम्मा					

५. प्रयोगात्मक तथा परियोजना कार्य

बौद्ध अध्ययन विषयका सम्भावित प्रयोगात्मक तथा परियोजना कार्य निम्नलिखित छन् :

क्र. सं.	कक्षा ११			कक्षा १२		
	विषयक्षेत्र	प्रयोगात्मक कार्य विवरण	पाठ्य घण्टा	विषयक्षेत्र	प्रयोगात्मक कार्य विवरण	पाठ्य घण्टा
१	बुद्धको जीवन यात्रा	बुद्धकोजीवन चरित्र लेखी कक्षामा प्रस्तुत गर्ने	५	विश्वका प्रसिद्ध व्यक्तित्वहरूमा बुद्धको प्रभाव	बुद्ध धर्म मान्ने पाँच जना स्थानीय व्यक्तिलाई प्रभाव कसरी पन्यो भन्ने प्रश्न सोधी त्यसका आधारमा प्रतिवेदन तयार पार्ने बुद्ध धर्मको	५
	लुम्बिनी उद्यान	निदान कथा, ललितविस्तरका मुख्य विषयवस्तु तालिकामा लेखी कक्षामा प्रदर्शन गर्ने	५	प्रसिद्ध बुद्ध वचन	बुद्धका सन्देशमूलक विषयवस्तुपरक प्रसङ्ग सुनाएर अनुमान, पूर्वानुमान, प्रश्नोत्तर, शब्दबोध, अर्थबोध, सन्दर्भबोध, भावबोध, मुख्य बुँदा टिपोट आदिसँग सम्बन्धित प्रश्नहरू सोधी भन्न वा लेखन लगाउने	१०
	आधारभूत बुद्ध शिक्षा	हप्तामा एक पटक समथ ध्यान गर्ने	५	नेपालको बौद्ध सम्पदा	१. बुद्धको जन्मभूमि वा नजिकको बौद्धस्थल भ्रमण गरी त्यहाँ देखेका कुरा समेटि प्रतिवेदन तयार पारी कक्षामा प्रस्तुत गर्ने वा कुनै एक बौद्ध चाडपर्व मनाउने तरिका र उक्त चाडपर्वमा खाएने कुरा तथा लगाइने पहिरन उल्लेख गरी प्रतिवेदन तयार पार्ने	५
	बुद्ध र व्यक्तित्व	दश सुचरित्र र दश दुष्चरित्र लेखी कक्षामा प्रस्तुत	५	बुद्धको महापरिनिर्वाणपश्चात्	बुद्धको महापरिनिर्वाणपश्चात्	५

रूपान्तरण	गर्ने		बौद्ध धर्मको विकास	बौद्ध धर्मको विस्तारलाई रेखाचित्रमा देखाउने	
बुद्ध र प्रकृति	शिक्षकले तोकिएका शास्त्रीय मूल्यमान्यता वा सिद्धान्तसम्बद्ध विषयवस्तु, चित्र, परिवेश आदिको मौखिक वर्णन गर्ने	७	बौद्ध सङ्घ	स्थानीय बौद्ध मार्गलम्बीलाई सोधी बौद्ध सङ्घका नियमहरू लेखेर कक्षामा प्रदर्शन गर्ने	५
बुद्ध र समाज सुधार	बुद्ध धर्मका ज्ञातालाई सोधी बुद्धकालीन समाजको वर्ण, जातीय, वर्ग, लैङ्गिक व्यवस्थाका मुख्य विशेषता तालिकामा प्रस्तुत गर्ने	५	बुद्ध र लैङ्गिक समता	स्थानीय बौद्ध धर्मावलम्बीलाई सोधेर बुद्ध धर्ममा महिलाको अवस्था विषयमा टिपोट तयार पारी विद्यालयको भित्ते पत्रिकामा प्रदर्शन गर्ने	५
बौद्ध प्रतीकको प्रयोग र अर्थ	धर्मचक्र, अष्टमङ्गल, वज्र र घण्टा, मणि, बौद्ध झन्डा, कमलको फूल र बोधिवृक्षको चित्र बनाई तिनको विवरण लेखेर कक्षामा प्रस्तुत गर्ने	८	बौद्ध दृष्टिमा जीव र जगत्	कुनै निर्धारित शास्त्रीय मूल्यमान्यता वा सिद्धान्त छनोट गरी त्यसको वर्णन, उपयोग प्रक्रिया, सान्दर्भिकता र त्यसका बारेको स्वानुभूति भन्ने	५

६. सिकाइ सहजीकरण विधि तथा प्रक्रिया

बौद्ध अध्ययन विषयले बुद्धको जीवनी, बौद्ध दर्शन र बौद्ध शिक्षाका माध्यमले समग्र व्यक्तित्व विकास, अनुशासित र सकारात्मक सोचलाई परिपुष्ट गर्नुका साथै सरल जीवनशैली अपनाउन प्रेरित गर्छ । यस विषयको सिकाइ सहजीकरण प्रक्रियामा निर्धारित विषयवस्तुको सन्तुलित रूपमा छनोट र प्रयोग गर्नु सान्दर्भिक हुने देखिन्छ । विशेषतः “गरेर सिक” (learning by doing) को सिद्धान्तअनुसार बौद्ध अध्ययन विषयका सिकाइ सहजीकरण क्रियाकलापलाई अर्थपूर्ण, रुचिकर र प्रभावकारी बनाउन विषयवस्तुको प्रकृतिअनुसारको शिक्षण विधिको छनोट र प्रयोग गर्नुपर्छ । शिक्षण विधिको छनोट गर्दा विद्यार्थीको रुचि, क्षमता, स्तर, उमेर आदिलाई ध्यान दिई विद्यार्थीलाई नै सहभागी गराएर विद्यार्थीकेन्द्रित शिक्षण विधि प्रयोग गरी बढीभन्दा बढी ज्ञान र सिप विकास गराउनुपर्दछ । शिक्षकले सहयोगीको भूमिका निर्वाह गरी विद्यार्थीलाई परियोजना कार्य (project work) का रूपमा स्थलगत अध्ययन भ्रमण, सामग्री सङ्कलन, अध्ययन तथा विश्लेषण, सिकाइलाई व्यवहारमा प्रदर्शन, सकारात्मक सोच र आचरणको अनुसरण, पञ्चशीलको पालना जस्ता पक्षमा जोड दिन आवश्यक हुन्छ ।

सिकाइ सहजीकरणलाई प्रभावकारी र गुणस्तरीय बनाउन बौद्ध अध्ययन विषयमा समावेश गरिएका विषयक्षेत्रलाई एकीकृत रूपमा अध्ययन गराई विषयवस्तुको ज्ञान, सिप र धारणाको विकास गराउनुपर्दछ । विषयवस्तुको व्यावहारिक ज्ञान दिनका लागि आआफ्नो टोल, समुदाय, गोन्पा, विहार, बौद्ध अध्ययन केन्द्रहरूसँग सम्बन्ध राखी क्रियाकलापहरू गराउनुपर्दछ । यी विषयवस्तुका आधारमा विद्यार्थीहरूलाई आफ्ना धार्मिक समुदायमा सान्दर्भिक थप विषयवस्तु खोज गरी सिकेका कुराहरूलाई सिर्जनात्मक विश्लेषण गर्ने प्रतिभाको विकास गर्न प्रोत्साहित गरिनुपर्दछ । यो विषय अध्यापनमा विभिन्न विधिहरू प्रयोग गर्न सकिन्छ, जस्तै : प्रश्नोत्तर विधि, प्रदर्शन विधि, समस्या समाधान विधि, अवलोकन विधि, छलफल विधि, प्रयोग विधि, अभिनय विधि, परियोजना विधि, प्रवचन/वाचन विधि, ध्यान विधि, आदि । जुनसुकै क्रियाकलाप गराउँदा पनि विद्यार्थीकेन्द्रित हुनु आवश्यक हुन्छ । अध्यापन गर्दा विद्यार्थीहरूको सहभागितालाई प्रोत्साहित गर्नुपर्दछ । विद्यार्थीहरू आफैलाई कुनै कुनै समस्या समाधान गर्न गाह्रो अप्ठ्यारो पर्न सक्छ त्यस्तो अवस्थामा मात्र कमीकमजोरीलाई राम्ररी केलाई शिक्षकद्वारा सहयोग पुऱ्याई समाधान गरिदिनु उचित हुन्छ ।

७. विद्यार्थी मूल्याङ्कन

विद्यार्थीको सिकाइ उपलब्धि सुनिश्चित गर्न निर्माणात्मक र निर्णयात्मक दुवै प्रकारको मूल्याङ्कन गर्नुपर्ने छ । विद्यार्थीको सिकाइ उपलब्धि सुधारका लागि कक्षा शिक्षणकै क्रममा कक्षाकार्य, परियोजना कार्य, प्रस्तुतीकरण, उपलब्धि परीक्षा जस्ता क्रियाकलाप गराई सैद्धान्तिक तथा प्रयोगात्मक ज्ञान तथा सिप हासिल गराउन आवश्यक छ । यसको प्रभावकारी रूपमा कार्यान्वयन तथा विद्यार्थीको सिकाइस्तर सुधार गर्न सिकाइ सहजीकरण क्रियाकलापको अभिन्न अङ्गका रूपमा निर्माणात्मक मूल्याङ्कनलाई उपयोग गर्नुपर्छ । निर्माणात्मक मूल्याङ्कनको सिकाइ उपलब्धिको निश्चित भारलाई निर्णयात्मक मूल्याङ्कनमा समेत जोडिने छ ।

पाठ्यक्रमले निर्धारण गरेका उद्देश्यअनुरूप विद्यार्थीहरूले ज्ञान, सिप तथा अभिवृत्ति प्राप्त गर्न सके सकेनन् भन्ने कुरा पत्ता लगाउने महत्त्वपूर्ण संयन्त्र मूल्याङ्कन हो । विद्यार्थीहरूको मूल्याङ्कन गर्दा सिकाइ उपलब्धिहरूलाई ध्यान दिई सक्षमता र सिकाइ उपलब्धिअनुरूप सिकाइको सबै स्तरलाई समेटेर गर्नुपर्दछ । आन्तरिक र बाह्य मूल्याङ्कनमार्फत यस विषयको मूल्याङ्कन हुने छ । कक्षा ११ र १२ मा ५ पाठ्यघण्टा रहने व्यवस्था गरिएको छ । कुल पाठ्यघण्टामध्ये २५ प्रतिशत आन्तरिक र ७५ प्रतिशत बाह्य मूल्याङ्कन हुने छ । यसै गरी बाह्य मूल्याङ्कनअन्तर्गत लिखित परीक्षा सञ्चालन हुने छ । विद्यार्थी मूल्याङ्कनअन्तर्गत निर्माणात्मक र निर्णयात्मक मूल्याङ्कन दुवै तरिकाबाट नै गरिने छ । यस विषयका पाठ्यक्रममा समावेश गरिएका तहगत सक्षमताहरू, कक्षागत सिकाइ उपलब्धि र तिनका विषयवस्तु, सोसँग सम्बन्धित सिप, सिकाइ सहभागिता र सिकाइ सक्रियताका आधारमा विद्यार्थीहरूको सिकाइको मूल्याङ्कन गर्नुपर्दछ ।

(क) आन्तरिक मूल्याङ्कन

सिकाइका क्रममा विद्यार्थीले के कति सिके भन्ने पक्षको मूल्याङ्कन गरी नसिकेको भए नसिकनुको कारण अन्वेषण गरी पुनः सिकाइन्छ । यस्तो मूल्याङ्कन कक्षाकोठामा सिकाइ सहजीकरण प्रक्रियाकै क्रममा कक्षाकार्य, गृहकार्य, कक्षा सहभागिता, व्यावहारिक परिवर्तन, हाजिरीका आधारमा गरेर अभिलेख राख्नुपर्छ । साथै एकाइ तथा त्रैमासिक परीक्षाहरू सञ्चालन गरी विद्यार्थीको सिकाइको मूल्याङ्कन गर्नुपर्छ । मूल्याङ्कन नतिजाका आधारमा आवश्यकतानुसार विद्यार्थीलाई तुरन्त पृष्ठपोषण प्रदान गर्नुका साथै आवश्यकतानुसार सुधारात्मक तथा उपचारात्मक शिक्षण गरी विद्यार्थीलाई सिकाइ सुधारको अवसर प्रदान गर्नुपर्छ । यस्तो आन्तरिक मूल्याङ्कनको मुख्य उद्देश्य सिकाइ सुधार गर्नु भए पनि यसको केही भार निर्णयात्मक मूल्याङ्कनमा पनि समावेश गरिने छ । कक्षा ११ र १२ प्रत्येकमा आन्तरिक मूल्याङ्कनबाट निम्नअनुसारको २५ अङ्क निर्णयात्मक मूल्याङ्कनमा समावेश गरिने छ ।

सि. नं.	मूल्याङ्कनका आधार	अङ्क
१	कक्षा सहभागिता	३
२	त्रैमासिक परीक्षाको अङ्कबाट	६
३	परियोजना कार्य	८
४	विषयवस्तुको बोध र मौखिक तथा लिखित अभिव्यक्ति	८
जम्मा		२५

(ख) बाह्य मूल्याङ्कन

यस विषयमा कक्षा ११ र १२ प्रत्येकमा कुल भारतमध्ये ७५ प्रतिशत भार बाह्य मूल्याङ्कन हुने छ । कक्षा ११ र १२ प्रत्येक कक्षामा लागि लिइने परीक्षाका लागि पाठ्यक्रम विकास केन्द्रले तयार गरेको विशिष्टीकरण तालिकाअनुसार प्रश्नपत्र निर्माण गर्नुपर्ने छ । यस विषयको परीक्षामा विशेष गरेर ज्ञान/बोध, समस्या समाधान, समालोचनात्मक, सिर्जनासँग सम्बन्धित प्रश्नहरू सोधिने छन् । पाठ्यक्रमले निर्धारण गरेका उद्देश्यअनुरूप विद्यार्थीहरूले ज्ञान, सिप, अभिवृत्ति प्राप्त गरे नगरेको मूल्याङ्कन गरिन्छ ।

प्रायोगिक कला

Applied Arts

कक्षा ११ र १२

विषय सङ्केत : Apa. 423 (कक्षा ११) Apa. 424 (कक्षा १२)

पाठ्यघण्टा : ५

वार्षिक कार्य घण्टा : १६०

१. परिचय

विद्यालय तहको प्रायोगिक कला विषयको पाठ्यक्रमको मूल लक्ष्य लोकप्रिय र उत्पादित सामग्रीसँग सम्बन्धित व्यवसायिक कलाका रूपमा गरिने कार्यलाई जनाउँछ । उत्पादन र व्यवसायसँग प्रत्यक्ष सम्बन्ध राख्ने यस कलाको परम्परागत मौलिक अभ्यास, नवीनतम अभ्यासलाई जोड दिई पाठ्यक्रम निर्माण गरिएको हो । यस पाठ्यक्रममा तल्लो तहमा प्राप्त गरेका विविध विषयका विषयगत ज्ञान तथा सिप र क्रियात्मक अनुभवलाई समेट्दै प्रायोगिक कलाका विषयवस्तु समावेश गरिएको छ । प्रायोगिक कलाको पहिचान, बोध, योजना उपयोग र व्यवस्थापन गर्न यसमा स्वाध्ययनको पूर्वाधारका लागि आवश्यक विषयवस्तुहरू समावेश गरिएका छन् । यस विषयका विषयवस्तुहरूको सहजीकरणका लागि कक्षा ११ र १२ गरी हरेक कक्षामा पाठ्यभार १६० कार्यघण्टा वा ५ पाठ्यघण्टा कायम गरी क्षेत्रगत रूपमा समेत बाँडफाँड गरिएको छ । यसमा विषयवस्तुको सीमा निर्धारण गरिनुका साथै सिकाइ क्रियाकलाप र मूल्याङ्कन प्रक्रियालाई बढी वस्तुगत र व्यावहारिक बनाउने प्रयास गरिएको छ ।

प्रायोगिक कलाको सिद्धान्त रेखाचित्र तथा डिजाइनका विविध पक्ष र पाटा जस्ता विषयवस्तु समेटी तयार पारिएको यस विषयको पाठ्यक्रम तयार पार्दा विभिन्न समयमा सरोकारवाला, अध्यापक तथा अभिभावकहरूको पाठ्यक्रम विकास केन्द्रमा दिएका राय सुझाव तथा सरसल्लाहलाई आत्मसात् गर्दै शिक्षा सिद्धान्तअनुरूप व्यवस्थित गरिएको छ । उक्त विषयवस्तु समायोजन गर्दा पाठ्यक्रमलाई सरल, प्रायोगिक, समयसापेक्ष र स्तरीय बनाउनुपर्ने पक्षलाई ध्यान दिइएको छ । साथै विषयको उल्लिखित तथ्यलाई ध्यानमा राखी प्रायोगिक कला विषयलाई ५० प्रतिशत प्रयोगात्मक र ५० प्रतिशत सैद्धान्तिक (लिखित तथा अन्य) मूल्याङ्कनमा आधारित हुने गरी सिकाइ सहजीकरण तथा मूल्याङ्कन प्रक्रियालाई व्यवस्थित गरिएको छ ।

यस पाठ्यक्रममा यस क्रममा पाठ्यक्रम लेखनको विषयगत औचित्य, पाठ्यक्रममा रहेका मुख्य विशेषता तथा पाठ्यक्रमको स्वरूपलाई समेटी परिचय, विषयगत रूपमा अपेक्षित ज्ञान, सिप, अभिवृत्ति, मूल्य र कार्य तत्परतालाई समेटी त्यसको क्रियात्मक स्वरूपमा सक्षमता समावेश गरिएको छ । त्यसै गरी यसमा सिकाइका स्तर र सक्षमताको विशिष्टीकृत विस्तृतीकरण गरी सिकाइ उपलब्धि र सक्षमतालाई सम्बन्धित गरिएको छ भने कक्षासँगको लम्बीय सन्तुलनका आधारमा विषयवस्तुको क्षेत्र र क्रम, विषयगत विशिष्टता र मौलिकतालाई समेटिएको छ । यसमा सिकाइ सहजीकरणका विधि तथा प्रक्रियाका साथसाथै निर्माणात्मक र निर्णयात्मक मूल्याङ्कनका विधि तथा प्रक्रिया उल्लेख गरी विद्यार्थी मूल्याङ्कनलाई व्यवस्थित गरिएको छ ।

२. तहगत सक्षमता

माध्यमिक तह कक्षा ११ र १२ मा प्रायोगिक कला (Applied Arts) विषयको अध्ययन पूरा गरेपछि विद्यार्थीहरू निम्नलिखित कार्यहरू गरी सक्षम हुने छन्:

१. प्रायोगिक कलाको व्यावहारिक ज्ञान हासिल तथा यसको विकासक्रमको बोध र प्रयोग
२. प्रायोगिक कलासम्बन्धी विधि, प्रविधि तथा सिद्धान्तको बोध र दैनिक जीवनमा प्रयोग
३. रेखाचित्र र दृष्टान्तचित्रसम्बन्धी व्यावहारिक विधिको बोध र उपयोग
४. डिजाइन अनुसन्धान (Design Research) को अध्ययन, अनुसन्धान र यसको उपयोग
५. टाइपोग्राफीको विश्लेषण र प्रयोग

६. रडका प्रकार र व्यावहारिक रूपमा उपयोग
७. कम्प्युटर एप्लिकेसनसम्बन्धी ज्ञान, बोध र सिर्जनात्मक प्रयोग
८. फोटोग्राफीसम्बन्धी व्यावहारिक ज्ञान र विधिको उपयोग
९. छपाई कार्यको अवस्थाको अध्ययन र प्रयोग

३. कक्षागत सिकाइ उपलब्धि

कक्षा ११			कक्षा १२	
क्र.स.	एकाइ र विषयक्षेत्र	सिकाइ उपलब्धि	एकाइ र विषयक्षेत्र	सिकाइ उपलब्धि
१.	डिजाइन	<ul style="list-style-type: none"> ● प्रायोगिक कलाको परिचय बताउन ● समाजमा डिजाइनको अवस्था र यसले पारेको प्रभाव, यसको क्षेत्रका बारेमा जानकारी ● डिजाइनको भूमिका र जिम्मेवारीका बारेमा जानकारी 	ग्राफिक डिजाइन	<ul style="list-style-type: none"> ● ग्राफिक डिजाइनको इतिहासका बारेमा बताउन ● ग्राफिक डिजाइनको ऐतिहासिकता बोध गरी प्रस्तुत गर्न ● नेपाली प्रयोगात्मक कलाको इतिहासका मुख्य पक्षहरू प्रस्तुत गर्न
२.	डिजाइनका तत्व र सिद्धान्तहरू	<ul style="list-style-type: none"> ● डिजाइनका तत्वहरूको जानकारी लिई प्रयोग गर्न ● डिजाइनको महत्व र सिद्धान्तहरूको बोध गरी प्रस्तुत गर्न 	छपाई प्रविधि	<ul style="list-style-type: none"> ● छपाई प्रविधिको बोध गरी प्रयोगात्मक अभ्यास गर्न ● ब्लक, सिल्क, डिजिटल तथा अफसेट प्रिन्टिङको परिचय दिन ● छपाई कार्य निर्माणका प्रक्रिया अबलम्बन गरी उपयोग गर्न ● स्थानीय वस्तुबाट गरिने छपाईको अवस्था अध्ययन गरी प्रयोग गर्न

३.	औजार तथा सामग्री	<ul style="list-style-type: none"> ● औजार तथा सामग्रीहरूको प्रदर्शन गरी प्रयोग गर्न 	दृष्टान्तचित्र (Illustration)	<ul style="list-style-type: none"> ● कथा, कविता, निबन्ध वा अन्य कुनै विषयमा आधारित दृष्टान्त चित्रका बारेमा दिन ● विभिन्न चराचुरुङ्गी तथा जनावरहरूका दृष्टान्तचित्रसम्बन्धी अध्ययन गरी प्रस्तुत गर्न ● मानिसको शरीरको दृष्टान्तचित्रको अध्ययन गरी उपयोगका बारेमा बताउन ● प्राकृतिक अवस्थाको अध्ययन गरी व्यवहारमा उपयोग गर्न
४.	रङ (Color)	<ul style="list-style-type: none"> ● रङको परिचय दिन ● रङ लगाउने तरिकाको बोध गरी अभ्यास गर्न ● रङसम्बन्धी तालिकाको बारेमा ज्ञान हासिल गर्न ● रङका प्रकारहरूको जानकारी लिई अवस्थाअनुसार रङको प्रयोग गर्न 	लोगो (Logo)	<ul style="list-style-type: none"> ● लोगोको परिचय दिन ● लोगो निर्माण गर्ने तरिकाको बोध गरी अभ्यास गर्न
५.	प्याटर्न (Pattern)	<ul style="list-style-type: none"> ● प्याटर्नमा आधारित डिजाइनको परिचय दिन ● प्याटर्नमा आधारित डिजाइनका प्रकारलाई तालिकामा प्रस्तुत गर्न ● प्याटर्नमा आधारित डिजाइन निर्माण गर्दा प्रयोग गर्ने विधिहरूको जानकारी लिई प्रयोग गर्न ● प्याटर्नमा आधारित डिजाइनका प्रकारलाई तालिकामा प्रस्तुत गर्न ● प्याटर्नमा आधारित डिजाइन निर्माण गर्दा प्रयोग गर्ने विधिहरूको ज्ञान हासिल गरी प्रयोग गर्न 	लेआउट र कम्पोजिसन (Layout and Composition)	<ul style="list-style-type: none"> ● लेआउट र कम्पोजिसनको परिचय दिन ● लेआउट डिजाइनका आधारभूत विषयका बारेमा जानकारी दिन ● प्रकाशन अथवा सम्पादकीय डिजाइनका बारेमा ज्ञान हासिल गर्दै प्रयोग गर्न ● पेज, किताब तथा पुस्तकको आवरणको परिचय दिन ● पेज, किताब तथा पुस्तकको आवरणका बारेमा अध्ययन गर्न ● पेज, किताब तथा पुस्तकको आवरण निर्माणसम्बन्धी अभ्यास गर्न ● म्यागेजिन तथा न्युजपेपरको

		<ul style="list-style-type: none"> स्थानीय रूपमा प्रयोग गरिएका प्याट्रन तथा टेक्साटाइल डिजाइनको उपयोगका बारेमा बताई प्रयोग गर्न 		डिजाइनका बारेमा ज्ञान हासिल गर्दै प्रयोग गर्न
६.	दृष्टान्तचित्र (Illustration)	<ul style="list-style-type: none"> दृष्टान्तचित्रका बारेमा जानकारी लिई यसका उद्देश्य बताउन दृष्टान्तचित्रको प्रकार र प्रयोग गर्ने तरिकाको अभ्यास गर्न विभिन्न स्थिरवस्तु तथा जीवजन्तुको दृष्टान्तचित्र बनाई व्यवहारमा प्रयोग गर्न 	पोस्टर (Poster)	<ul style="list-style-type: none"> पोस्टरको परिचय दिन पोस्टरमा प्रयोग गरिने विभिन्न रङ बोध गरी अभ्यास गर्न पोस्टरमा प्रयोग गरिने विभिन्न रङ प्रयोग गर्ने विधिहरूको जानकारी लिई पोस्टरलाई आकर्षक बनाउन रङको तालमेल मिलाउन पोस्टर निर्माणका सम्बन्धमा बोध गरी प्रस्तुत गर्न पोस्टर निर्माणको सामाजिक सन्देशमूलक, व्यावसायिक उपयोगका क्षेत्र पहिचान गरी रङ भनें तरिकाको प्रयोग गर्न
७.	टाइपोग्राफी	<ul style="list-style-type: none"> टाइपोग्राफीको बोध गरी अभ्यास गर्न विभिन्न समयमा भएका (देवनागरी, रोमन, मातृभाषाका लिपि) लिपिहरूको ज्ञान लिई प्रयोग गर्न टाइपोग्राफीको प्रयोग गर्ने विधिहरूको उपयोग गर्न टाइपोग्राफीको प्रकारहरूको बारेमा सङ्क्षिप्त वर्णन गरी व्यवहारमा प्रयोग गर्न भावपूर्ण शब्दहरू (Expressive words) सम्बन्धी जानकारी लिई प्रयोग गर्न 	कम्प्युटर एप्लिकेसनको प्रयोग	<ul style="list-style-type: none"> कम्प्युटर एप्लिकेसनसम्बन्धी ज्ञान हासिल गरी परिचय दिन इमेज म्यानुपेलेसनको परिचय दिई अभ्यास गर्न लेआउट एप्लिकेसनको परिचय दिई अभ्यास गर्ने <p>पत्रिका, पुस्तक र तथा लेआउट डिजाइन कार्य निर्माणसम्बन्धी अभ्यास गर्न</p>
८.	फोटोग्राफी	<ul style="list-style-type: none"> फोटोग्राफीको परिचय दिन फोटोग्राफीका प्रकारहरूको बोध गरी प्रस्तुत गर्न 	डिजाइन अनुसन्धान परियोजना (Design Research)	<ul style="list-style-type: none"> स्थानीय रूपमा प्रचलित प्रयोगात्मक कला खोज गरी प्रस्तुत गर्न

		<ul style="list-style-type: none"> • फोटोग्राफीको प्रयोग गर्न 	Project)	<ul style="list-style-type: none"> • प्रयोगात्मक कला र प्रयोगको अवस्थाको जानकारी लिई उपयोग गर्न • प्रयोगात्मक कलाको आकार तथा आकृतिको परिचय र अवस्थाको अध्ययन अनुसन्धान गरी प्रयोग गर्न • विभिन्न जनजातिमा प्रचलित लोककलामा आधारित कलाकृतिसम्बन्धी ज्ञान हासिल
--	--	------------------------------------------------------------------------------	----------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

४. विषयवस्तुको क्षेत्र र तालिका (Scope and Sequence of Contents)

Unit	Class 11			Class 12		
	Scope	Content	Hrs	Scope	Content	Hrs
1	Design	<ul style="list-style-type: none"> ▪ Introduction to Design ▪ Roles of Design in Society ▪ Impact/Function of Design ▪ Scope of Design ▪ Application of Design ▪ Roles and Responsibility of Designers 	5	Graphic Design	<ul style="list-style-type: none"> • History of Graphic Design <ul style="list-style-type: none"> ○ Development of Graphic Design in the world ○ Development of Graphic Design in Nepal 	5
2	Elements and Principles of Design	<ul style="list-style-type: none"> ▪ Elements of Design <ul style="list-style-type: none"> ○ <i>line</i> ○ <i>Shape</i> ○ <i>Space</i> ○ <i>Form</i> ○ <i>Texture</i> ○ <i>Value</i> ○ <i>Colour</i> ▪ Principles of Design <ul style="list-style-type: none"> ○ <i>Balance</i> ○ <i>Rhythm</i> 	20	Printing Technology	<ul style="list-style-type: none"> • Introduction to Printing Technology • Types of Printing <ul style="list-style-type: none"> ○ <i>Block Printing</i> ○ <i>Silk Screen Printing</i> ○ <i>Digital Printing</i> ○ <i>Offset Printing</i> 	10

		<ul style="list-style-type: none"> ○ <i>Unity</i> ○ <i>Variety</i> ○ <i>Harmony</i> ○ <i>Contrast</i> ○ <i>Proportion</i> ○ <i>Emphasis</i> ○ <i>Repetition</i> 				
3	Materials and Methods	<ul style="list-style-type: none"> ● Introduction to Materials and Methods used in Graphic Design ● Surface <ul style="list-style-type: none"> ○ <i>Paper</i> ○ <i>Other Surfaces</i> ● Pencils ● Color Pencils ● Pen and Ink (Nibs, Calligraphic Pens, Signpen, Marker etc) ● Poster Color / Designer Color ● Brush, Palette and other painting tools 	15	Illustration II	<ul style="list-style-type: none"> ● Children Book Illustration ● Book Illustration ● Caricature ● Comic Book ● Cartoon 	5
4	Color	<ul style="list-style-type: none"> ▪ Introduction to Color ▪ Primary ▪ Secondary ▪ Tertiary ▪ Additive and Subtractive Colors 	5	Logo	<ul style="list-style-type: none"> ● Introduction to Logo ● Fundamental of Logo Design ● Types of Logo 	5

5	Pattern	<p>Introduction to Pattern Design</p> <ul style="list-style-type: none"> • Types of Pattern <ul style="list-style-type: none"> ○ <i>Seamless</i> ○ <i>Central</i> ○ <i>Corner</i> ○ <i>Border</i> • Usages of Pattern <ul style="list-style-type: none"> ▪ Local and Indigenous Pattern Design 	5	Layout and Composition	<ul style="list-style-type: none"> • Introduction to Layout • Fundamentals of Layout Design <ul style="list-style-type: none"> ○ <i>Alignment</i> ○ <i>Composition</i> ○ <i>Format</i> ○ <i>Structure and Grid System for Layout Design</i> • Publication Design /Editorial Design <ul style="list-style-type: none"> ○ <i>Page / Book Layout / Book Cover</i> ○ <i>Magazine</i> ○ <i>Newspaper</i> 	20
6	Illustration I	<ul style="list-style-type: none"> • Introduction to Illustration • Types of Illustration • Perspective and its importance in drawing illustrations 	5	Poster	<ul style="list-style-type: none"> • Introduction to Poster • Fundamentals of Poster Design • Types of Posters <ul style="list-style-type: none"> ○ <i>Political</i> ○ <i>Social</i> ○ <i>Commercial</i> 	5
7	Typography	<ul style="list-style-type: none"> • Introduction to Typography • Devanagari, Roman and Local Scripts • Types of Typography <ul style="list-style-type: none"> ▪ <i>Serif</i> ▪ <i>San-serif</i> 	10	Computer Application	<ul style="list-style-type: none"> • Introduction to New Technology in Design • Usage of software in Graphic Design <ul style="list-style-type: none"> ○ <i>Image Making (Introduction</i> 	20

					<p>to drawing and illustration software)</p> <ul style="list-style-type: none"> ○ Image Manipulation (Introduction to photo editing software) ○ Layout Design Application (Introduction to layout software) 	
8	Photography	<ul style="list-style-type: none"> ● History of Photography ● Types of Camera and Lenses ● Technical Aspects of Photography ● Compositional Rules in Photography 	15	Design Research Project	<ul style="list-style-type: none"> ● Basic Introduction to Research ● Independent Research Project on local and indigenous design, patterns, approaches, practice, designers etc. 	10
Total			80			80

५. प्रयोगात्मक तथा परियोजना कार्य (Practical and Project Works)

यस विषयमा तल उल्लिखित प्रयोगात्मक तथा परियोजना कार्य गराई तिनको अभिलेख राख्नुपर्ने छ । यसका अतिरिक्त शिक्षकले स्थानीय परिवेश अनुरूपका स्थानीय कार्यकलाप समेत गराउन सक्ने छन् ।

Unit	Class 11			Class 12		
	Scope	Content	Hrs	Scope	Content	Hrs
1	Design	<ul style="list-style-type: none"> ▪ Scrapbook I <p>(Individual workload to collect various design related publications, materials and images printed on papers, magazines, catalogs, online etc for personal</p>	5	Graphic Design	<ul style="list-style-type: none"> ▪ Scrapbook II <p>(Individual workload to collect various design related publications, materials and images printed on</p>	5

		<i>and peers' reference)</i>			<i>papers, magazines, catalogs, online etc for personal and peers' reference)</i>	
2	Elements and Principles of Design	<ul style="list-style-type: none"> ▪ Exploration of Elements and Principles of Design using different art materials. ▪ Elements of Design <ul style="list-style-type: none"> ○ <i>line</i> ○ <i>Shape</i> ○ <i>Space</i> ○ <i>Form</i> ○ <i>Texture</i> ○ <i>Value</i> ○ <i>Color</i> ▪ Principles of Design <ul style="list-style-type: none"> ○ <i>Balance</i> ○ <i>Rhythm</i> ○ <i>Unity</i> ○ <i>Variety</i> ○ <i>Harmony</i> ○ <i>Contrast</i> ○ <i>Proportion</i> ○ <i>Emphasis</i> ○ <i>Repetition</i> 	15	Printing Technology	<ul style="list-style-type: none"> • Block Printing • Stencil Printing • Printing process based on local knowledge and resources 	5
3	Materials and Methods	<ul style="list-style-type: none"> • Preparation of Nibs from local materials viz. bamboo, quill etc. • Collection, Exploration and 	5	Illustration II	<ul style="list-style-type: none"> • Drawing with basic shapes and forms II • Study of human figures 	20

		Experimentation with various art materials			<ul style="list-style-type: none"> • Illustration base on a text (<i>Poem, story, essay etc</i>) • Caricature / Cartoon 	
4	Color	<ul style="list-style-type: none"> ▪ Preparation of color chart based on <ul style="list-style-type: none"> ○ <i>Primary</i> ○ <i>Secondary</i> ○ <i>Tertiary</i> ▪ Preparation of color combinations based on suggested themes viz seasons, moods, emotions, ethnicity, food, culture, locality 	10	Logo	<ul style="list-style-type: none"> • Logo Sketches • Black and White Logo • Color Logo 	5
5	Pattern	<ul style="list-style-type: none"> • Development of different patterns based on <ul style="list-style-type: none"> ○ <i>Seamless</i> ○ <i>Central</i> ○ <i>Corner</i> ○ <i>Border</i> ▪ Local and indigenous pattern design 	5	Layout and Composition	<u>Manual Design Exercise</u> <ul style="list-style-type: none"> • Stationery Design <ul style="list-style-type: none"> ○ Visiting Card ○ Letter Head ○ Envelop • Invitation Card • Book Cover • Threefold Brochure 	20
6	Illustration I	<ul style="list-style-type: none"> • Drawing with basic shapes and forms • Study of Perspective <ul style="list-style-type: none"> ○ <i>One Point</i> ○ <i>Two Points</i> • Study of birds and animals • Basic illustrations with 	20	Poster	<ul style="list-style-type: none"> • Designing a poster based on following issues <ul style="list-style-type: none"> ○ Social ○ Commercial 	5

		birds and animals as characters				
7	Typography	<ul style="list-style-type: none"> Anatomy of Typography (Devanagari / Roman) Types of Typography <ul style="list-style-type: none"> Serif San-serif Expressive Words Design a word/s based on local script 	10	Computer Application	<ul style="list-style-type: none"> A general practice with Digital Tools <ul style="list-style-type: none"> Image Making Image Manipulation Layout Design 	10
8	Photography	<ul style="list-style-type: none"> Use of camera with the understanding of aperture, shutter speed, depth of field and other technical aspects Portrait photography Daily life's photography Outdoor photography 	10	Design Research Project	<ul style="list-style-type: none"> Field Visit, Interviews, Documentation and Archiving Submission of a report based on local and indigenous design, patterns, approaches, practice, designers etc. 	10
		Total	80			80

६. सिकाइ सहजीकरण प्रक्रिया

यस पाठ्यक्रमले प्रायोगिक कलाका बारेमा सैद्धान्तिक तथा प्रयोगात्मक दुवै प्रकारको ज्ञान प्रदान गर्दछ । यस विषयमा विषयगत विषयवस्तुका साथै प्रयोगात्मक क्रियाकलापहरू पनि समावेश गरिएका छन् । यस पाठ्यक्रमले विद्यार्थीलाई प्रयोगात्मक ज्ञान प्रदान गर्ने कुरामा जोड दिएको छ । यसले विद्यार्थीमा विषय क्षेत्रगत ज्ञान, सिप र आत्मविश्वास प्रदान गर्दछ । यस पाठ्यक्रमको उद्देश्य हासिल गर्न शिक्षक कक्षाकोठामा र स्थलगत भ्रमणका बेला पूर्ण रूपले विद्यार्थीसँग घुलमिल हुनु आवश्यक हुन्छ । सिकाइ सहजीकरण क्रियाकलापहरू सञ्चालन गर्न सम्भव भएसम्म स्थानीय रूपमा उपलब्ध सामग्रीहरूलाई नै उपयोग गर्नुपर्छ । यस पाठ्यक्रमको समग्र उद्देश्य हासिल गर्न शिक्षकले विभिन्न सिकाइ विधिहरूको प्रयोग गर्न सक्दछन् । यसका लागि निम्नानुसारका जस्तै सिकाइ विधिहरूको उपयोग गर्न सकिनेछः

- समूहगत छलफल विधि
- अवलोकन भ्रमण विधि
- प्रदर्शनी विधि

- वैयक्तिक अध्ययन विधि
- प्रश्नोत्तर विधि
- प्रयोग विधि
- परियोजना कार्य
- समस्या समाधान विधि

सिकाइ सहजीकरण प्रक्रिया सञ्चालन गर्दा शिक्षकले निम्नानुसारका पक्षमा ध्यान दिनुपर्नेछ :

- शिक्षकले वार्षिक शैक्षणिक योजना, एकाइ योजना र दैनिक पाठ्योपयोग निर्माण गरी सोअनुसार सिकाइ प्रक्रिया सञ्चालन गर्नुपर्छ ।
- प्रायोगिक कला शिक्षासम्बद्ध सहजीकरण क्रियाकलापहरू सञ्चालन गर्दा विद्यार्थीहरूका पूर्वअनुभव, अवधारणा, उनीहरूको बसोबास क्षेत्रको अवस्था, बसोबास क्षेत्रमा विद्यमान प्राकृतिक तथा सांस्कृतिक विशेषताहरू, विद्यार्थीको अभिरुचि तथा धार्मिक सांस्कृतिक विश्वास आदि समेतलाई ध्यान दिनुपर्छ । यो विषय प्रयोगात्मक विषयसमेत भएकाले प्रदर्शन, अवलोकन र उपयोगलाई विशेष प्राथमिकता दिनुपर्छ ।
- सैद्धान्तिक विषयवस्तुको प्रस्तुतिपछि विद्यार्थीहरूलाई यथासम्भव उदाहरण, स्थलगत भ्रमण एवम् प्रयोगात्मक कार्य गर्न लगाउनुपर्छ ।
- सिकाइ सहजीकरण प्रक्रियामा विद्यार्थीमा समझदारी, क्रियात्मक सोचाइ तथा प्रयोगात्मक सिप र अभिवृत्तिको विकास गर्ने क्रियाकलापलाई जोड दिनुपर्छ । सिकाइलाई बोधमा मात्र सीमित नराखी ज्ञानमा पूर्णता प्रदान गर्नका लागि पर्याप्त अवसर दिई प्राप्त ज्ञानलाई सिर्जनात्मक प्रयोगमा रूपान्तरण गर्न सक्ने अवस्थामा पुऱ्याउनुपर्छ ।
- प्रायोगिक कलाको अध्ययनका क्रममा पेन्सिल, पोस्टर रङ, पेन्सिल कलर, पेन एण्ड इन्क आदिको साथै शीर्षक अनुसार प्रयोग गरी प्रयोगात्मक कार्य गर्न लगाउनुपर्छ ।
- सिकाइ सहजीकरणका क्षेत्रमा विद्यालयमा उपलब्ध हुन नसक्ने सामग्री र तिनीहरूको प्रयोगका सम्बन्धमा स्थानीय स्तरका सम्बन्धित क्षेत्रमा क्रियाशील संस्थाहरू, सामुदायिक स्रोत र अभिभावकसँग सम्पर्क गर्नुपर्छ । यस्ता स्रोतहरूको प्रयोग गर्दा सम्बन्धित ठाउँमा नै लगेर तिनको प्रयोग र सञ्चालित क्रियाकलाप आवश्यकताअनुसार प्रदर्शन गर्नुपर्छ ।
- शिक्षकले कुनै पनि शिक्षण विधि अपनाउनुभन्दा पहिले निम्नलिखित कुरामा ध्यान दिनुपर्ने हुन्छह
 - (क) विद्यार्थीको बुझ्ने क्षमता र परिपक्वता
 - (ख) आफूले रोजेको विधिहरूबाट अध्यापन सफल हुने विश्वास
 - (ग) सफलता प्राप्तिका लागि विद्यार्थीमा अभिरुचि जागरण
 - (घ) विद्यार्थीमा सिर्जनशील रूपमा विचार गर्ने र सहयोग गर्ने भावना
 - (ङ) स्थानीय स्तरमा उपलब्ध हुने साधन स्रोत तथा विज्ञ ।

७. विद्यार्थी मूल्याङ्कन प्रक्रिया

विद्यार्थीको सिकाइ उपलब्धि सुनिश्चित गर्न निर्माणात्मक र निर्णयात्मक दुवै प्रकारको मूल्याङ्कन गर्नुपर्ने छ । विद्यार्थीको सिकाइ उपलब्धि सुधारका लागि कक्षा शिक्षणकै क्रममा कक्षाकार्य, परियोजना कार्य, प्रस्तुतीकरण, उपलब्धि परीक्षा जस्ता क्रियाकलाप गराई सैद्धान्तिक तथा प्रयोगात्मक ज्ञान तथा सिप हासिल गराउन आवश्यक छ । यसको प्रभावकारी रूपमा

कार्यान्वयन तथा विद्यार्थीको सिकाइस्तर सुधार गर्न सिकाइ सहजीकरण क्रियाकलापको अभिन्न अङ्गका रूपमा निर्माणात्मक मूल्याङ्कनलाई उपयोग गर्नुपर्छ । निर्माणात्मक मूल्याङ्कनको सिकाइ उपलब्धिको निश्चित भारलाई निर्णयात्मक मूल्याङ्कनमा समेत जोडिने छ । पाठ्यक्रमले निर्धारण गरेका उद्देश्यअनुरूप विद्यार्थीहरूले ज्ञान, सिप तथा अभिवृत्ति प्राप्त गर्न सके सकेनन् भन्ने कुरा पत्ता लगाउने महत्वपूर्ण संयन्त्र मूल्याङ्कन हो । विद्यार्थीहरूको मूल्याङ्कन गर्दा सिकाइ उपलब्धिहरूलाई ध्यान दिई सक्षमता र सिकाइ उपलब्धिअनुरूप सिकाइको सबै स्तरलाई समेटेर गर्नुपर्दछ । आन्तरिक र बाह्य मूल्याङ्कनमार्फत यस विषयको मूल्याङ्कन हुने छ । कक्षा ११ र १२ मा ५ पाठ्यघण्टा रहने व्यवस्था गरिएको छ । कुल पाठ्यघण्टामध्ये ५० प्रतिशत आन्तरिक र ५० प्रतिशत बाह्य मूल्याङ्कन हुने छ । यसै गरी बाह्य मूल्याङ्कनअन्तर्गत लिखित परीक्षा सञ्चालन हुने छ । विद्यार्थी मूल्याङ्कनअन्तर्गत निर्माणात्मक र निर्णयात्मक मूल्याङ्कन दुवै तरिकाबाट नै गरिने छ । यस विषयका पाठ्यक्रममा समावेश गरिएका तहगत सक्षमताहरू, कक्षागत सिकाइ उपलब्धि र तिनका विषयवस्तु, सोसँग सम्बन्धित सिप, सिकाइ सहभागिता र सिकाइ सक्रियताका आधारमा विद्यार्थीहरूको सिकाइको मूल्याङ्कन गर्नुपर्दछ ।

(क) आन्तरिक मूल्याङ्कन

आन्तरिक तथा प्रयोगात्मक मूल्याङ्कनका लागि प्रत्येक विद्यार्थीहरूले गरेका कार्य र उनीहरूमा आएको व्यवहार परिवर्तनको अभिलेख राखी सोका आधारमा अङ्क प्रदान गर्नुपर्दछ । विद्यार्थीहरूले सिके नसिकेको पत्ता लगाई नसिकेको भए कारण पहिचान गरी पुनः सिकाइन्छ भने यस्तो मूल्याङ्कन प्रक्रियालाई निर्माणात्मक मूल्याङ्कन भनिन्छ । कक्षा ११ र १२ को प्रायोगिक कला विषय सिकाइका क्रममा कक्षाकोठामा कक्षागत शिक्षण सिकाइकै अभिन्न अङ्गका रूपमा गृहकार्य, कक्षाकार्य, परियोजना कार्य, सामुदायिक कार्य, सह/अतिरिक्त क्रियाकलाप, एकाइ परीक्षा, मासिक परीक्षा जस्ता मूल्याङ्कनका साधनहरूको प्रयोग गर्न सकिने छ र मूल्याङ्कनका लागि विद्यार्थीको अभिलेख राख्नुपर्छ । सोका आधारमा नै सिकाइ अवस्था यकिन गरिन्छ र आवश्यकतानुसार उपचारात्मक शिक्षण सिकाइ क्रियाकलाप सञ्चालन गर्नुपर्छ । विशेष सिकाइ आवश्यकता भएका विद्यार्थीका लागि विषय शिक्षकले नै उपयुक्त प्रक्रिया अपनाई मूल्याङ्कन गर्नुपर्छ । शिक्षकले यस प्रकारको मूल्याङ्कन निरन्तर रूपमा गरी विद्यार्थीहरूमा अपेक्षित सिप र व्यवहार विकासमा जोड दिनुपर्छ । आन्तरिक मूल्याङ्कनका आधारहरू यस प्रकार हुने छन् ।

क्र.सं.	क्षेत्र	अङ्कभार
१.	कक्षा सहभागिता	३
२.	त्रैमासिक परीक्षाको मूल्याङ्कन	६
३.	परियोजना तथा प्रयोगात्मक कार्य, प्रतिवेदन लेखन तथा प्रतिवेदनको प्रस्तुति	१६
४	बाह्य विज्ञद्वारा स्थलगत प्रयोगात्मक कार्य र अन्तर्वार्ता	२५
जम्मा		५०

(ख) बाह्य मूल्याङ्कन

यस विषयमा कक्षा ११ र १२ प्रत्येकमा कुल भारमध्ये ५० प्रतिशत भार बाह्य मूल्याङ्कन हुने छ । कक्षा ११ र १२ प्रत्येक कक्षामा लागि लिइने परीक्षाका लागि पाठ्यक्रम विकास केन्द्रले तयार गरेको विशिष्टीकरण तालिकाअनुसार प्रश्नपत्र निर्माण गर्नुपर्ने छ । यस विषयको परीक्षामा विशेष गरेर ज्ञान/बोध, समस्या समाधान, समालोचनात्मक, सिर्जनासँग सम्बन्धित प्रश्नहरू सोधिनेछन् । पाठ्यक्रमले निर्धारण गरेका उद्देश्यअनुरूप विद्यार्थीहरूले ज्ञान, सिप, अभिवृत्ति प्राप्त गरे नगरेको मूल्याङ्कन गरिन्छ । सबै बाह्य परीक्षामा अक्षराङ्कन पद्धतिको प्रयोग गरिने छ ।

गायन

कक्षा : ११ र १२

विषय सङ्केत : Sin.425 (कक्षा ११) Sin.426 (कक्षा १२)

पाठ्यघण्टा : ५

कार्यघण्टा : १६०

१. परिचय

सङ्गीत सांस्कृतिक कला हो । यसको संरक्षण, संवर्धन र जगेर्नाका लागि विद्यालय शिक्षामा सङ्गीतको शिक्षणको अपरिहार्यता हो । स्वर, ताल, लय आदिका साथ गायन, वादन गर्ने क्रियालाई सङ्गीत भनिन्छ । नेपाली संस्कृतिमा सङ्गीतको महत्वपूर्ण स्थान छ । नेपालमा शास्त्रीय सङ्गीत, लोक सङ्गीत, आधुनिक सङ्गीतका अतिरिक्त परम्परागत सङ्गीतको पनि महत्वपूर्ण स्थान रहेको छ । सङ्गीतको बोध, संरक्षण, सदुपयोग र व्यवस्थापन गर्ने तथा सैद्धान्तिक तथा प्रयोगात्मक पक्षका बारेमा आधारभूत ज्ञान तथा सिप प्रदान गर्ने उद्देश्यका साथ कक्षा ११ र १२ को गायन विषयको पाठ्यक्रम विकास गरिएको हो । राष्ट्रिय पाठ्यक्रम प्रारूप, २०७६ को मार्गदर्शनबमोजिम विद्यालय शिक्षाको माध्यमिक तह (कक्षा ११ र १२) मा गायन विषयको यस पाठ्यक्रममा गायनसम्बद्ध आधारभूत विषयवस्तु समावेश गरिएको छ । यस पाठ्यक्रमको अध्ययनपश्चात् वाद्यवादनसम्बद्ध विभिन्न सामग्री, सुर र तालसम्बद्ध पक्ष तथा तिनका बिचको अन्तरसम्बन्ध, क्रियाकलाप तथा प्रभावहरूका बारेमा परिचित गराई त्यसको सदुपयोग गर्न उत्प्रेरित गर्ने अपेक्षा राखिएको छ । यसका साथै यस पाठ्यक्रमले सम्बन्धित विषयमा उच्च शिक्षाको आधारसमेत तयार गर्ने अपेक्षा छ ।

गायन विषयको यस पाठ्यक्रममा लोक तथा शास्त्रीय सङ्गीतको अवधारणा, आधारभूत ज्ञान, महत्व र आवश्यकता, लोक तथाशास्त्रीय गायनमा प्रयोग हुने प्रमुख शब्दावली, स्वरलिपि तथा वाद्ययन्त्रहरूको बोध र गायनका सबै प्रकार तथा शैली, सङ्गीतमा स्वरलिपि, अलङ्कार, ताल र रचनाहरूको महत्त्व, आधुनिक गीतको इतिहास, शास्त्रीय गायक, वादकहरूको योगदान समावेश गर्ने प्रयास गरिएको छ । यसमा आफूले सिकेका ताल रचनाहरूलाई प्रचलित स्वरलिपिमा लिपिबद्ध गरी प्रस्तुति र लेख्य अभिव्यक्ति क्षमताको विकासमा समेत जोड दिने गरी विषयवस्तु छनोट गरिएको छ । शास्त्रीय सङ्गीतमा प्रयोग हुने र भौगोलिक वर्गीकरणानुरूप नेपालमा रहेका विविध जात धर्म र समाजमा आआनै प्रकारका ताल बाजा र स्वर प्रयोग हुँदै आइरहेको परिवेशमा यस पाठ्यक्रममा उल्लिखित विषयवस्तुमा सैद्धान्तिक तथा प्रयोगात्मक पक्षको सिकाइ गर्न विद्यार्थीकेन्द्रित सिकाइ सहजीकरण विधि तथा प्रक्रियामा जोड दिइएको छ । यस पाठ्यक्रमले ज्ञान पक्षमा भन्दा पनि सिप तथा अभिवृत्तिमा जोड दिई विषयको अध्ययनलाई व्यावहारिक र प्रयोगात्मक बनाउने प्रयास गरेको छ । गायनको क्षेत्रमा आएका नयाँ नयाँ अवधारणा र परिवर्तित प्रविधि र पद्धतिलाई समेत ध्यान दिएर यो पाठ्यक्रम तयार गरिएको छ । यस विषयको पाठ्यक्रम विकास गर्दा उल्लिखित विषयवस्तुको अवधारणा विकास, अभ्यास र निरन्तर सिकाइ तथा मूल्याङ्कनबिचको सन्तुलन कायम गरिएको छ ।

यस पाठ्यक्रममा यस क्रममा पाठ्यक्रम लेखनको विषयगत औचित्य, पाठ्यक्रममा रहेका मुख्य विशेषता तथा पाठ्यक्रमको स्वरूपलाई समेटेरी परिचय, विषयगत रूपमा अपेक्षित ज्ञान, सिप, अभिवृत्ति, मूल्य र कार्य तत्परतालाई समेटेरी त्यसको क्रियात्मक स्वरूपमा सक्षमता समावेश गरिएको छ । त्यसै गरी यसमा सिकाइका स्तर र सक्षमताको विशिष्टीकृत विस्तृतीकरण गरी सिकाइ उपलब्धि र सक्षमतालाई सम्बन्धित गरिएको छ भने कक्षासँगको लम्बीय सन्तुलनका आधारमा विषयवस्तुको क्षेत्र र क्रम, विषयगत विशिष्टता र मौलिकतालाई समेटिएको छ । यसमा सिकाइ सहजीकरणका विधि तथा प्रक्रियाका साथसाथै निर्माणात्मक र निर्णयात्मक मूल्याङ्कनका विधि तथा प्रक्रिया उल्लेख गरी विद्यार्थी मूल्याङ्कनलाई व्यवस्थित गरिएको छ ।

२. तहगत सक्षमता

माध्यमिक तह(कक्षा ११- १२) कोसङ्गीत विषयको अध्ययनपश्चात् विद्यार्थीहरू निम्नलिखित कार्य गर्न सक्षम हुनेछन् :

१. गायनको परिचय, परिभाषा तथा मूल सिद्धान्तको आधारभूत पक्षको बोध र व्यवहारमा प्रयोग
२. नेपाली लोक, आधुनिक तथा शास्त्रीय गायनको इतिहासको गहन अध्ययन गरी तिनको संरक्षण, संवर्धन, प्रवर्धन तथा उपयोग

३. गायनमा प्रयोग हुने पारिभाषिक शब्दावली, स्वरलिपि तथा वाद्ययन्त्रहरूको आधारभूत ज्ञान, अभ्यास, महत्त्वबोध तथा प्रस्तुति
४. राग, ताल, अलङ्कार, स्वरलिपिअनुसार लोक गायन, आधुनिक गायन तथा शास्त्रीय गायनको प्रयोग र अभ्यास
५. आफूले सिकेका सङ्गीतलाई गायनमा प्रस्तुति र लेख्य अभिव्यक्तिको विकास
६. पाश्चात्य सङ्गीत आधारभूत पक्षको बोध, प्रयोग र अभ्यास

३. कक्षागत सिकाइउपलब्धि

कक्षा ११			कक्षा १२	
क्र.स.	विषयक्षेत्र	सिकाइ उपलब्धि	विषयक्षेत्र	सिकाइ उपलब्धि
१.	नेपाली लोकगीत	<p>१.१ लोकगीत गायनको सामान्य परिचय दिन</p> <p>१.२. झ्याउरे, देउडा, च्याब्रुड, शोर्पा, मैथिली, फागु, मालश्री गीतको परिचय दिन</p> <p>१.३.नेपाली लोकगीत/सङ्गीतमा प्रयुक्त भाका र लय, बोली, चरण, थेंगो, टुक्का, रहनी, फुँदा, भाका टिप्नु, भाका छोप्नु, रहनी, टुप्पा र फेद, दोहरी, जुहारीको अर्थ बताउन</p>	नेपाली लोकगीत	<p>१.१. नेपाली लोकगीत गायनको ऐतिहासिक विकासक्रम बताउन</p> <p>१.२. चुड्के, घाँसे, वसन्त, टप्पा गीत, सालेजु गीत, भोजपुरी गीत गाउन</p> <p>१.३. तलका लोकगीत, सङ्गीतसँग सम्बन्धित नेपालका विभिन्न जाति, संस्था, पात्र तथा विषयको परिचय दिन :</p> <p>हुड्के, घाटुली, देउसे, भैली, रोदी, खलः, डवली, गर्रा, कर्खा</p> <p>१.४ हुड्के, घाटुली, देउसी, भैली, रोदी, खलः, डवली, गर्रा, कर्खामा प्रयोग हुने गीत, वाद्यवादन र तालको परिचय दिन</p> <p>१.५. मेलवादेवी, सेतुराम, मित्रसेन थापा, धर्मराज थापाको परिचय दिन</p>
२.	शास्त्रीय गीत	<p>२.१. शास्त्रीय गायनको परिचय दिन र यसका विविध पक्षहरूबारे बताउन</p> <p>२.२. राग भूपाली, राग यमन, राग काफी र राग वृन्दावनी सारङ्गको परिचय दिन</p> <p>२.३. शास्त्रीय गायनमा प्रयोग हुने ध्वनि, स्वर, आन्दोलन, नाद, श्रुति, थाट, सप्तक, वर्ण, थाट, जाति, राग, वादी,संवादी,</p>	नेपाली शास्त्रीय गायन	<p>२.१. नेपाली शास्त्रीय गायनको ऐतिहासिक विकासक्रम बताउन</p> <p>२.२. शास्त्रीय गायनअन्तर्गत प्रचलनमा रहेका गायन ख्याल, ठुमरी, गजल, भजन आदि शैलीहरूको प्रयोग गर्न</p> <p>२.३ पूवाङ्गवादी राग, उत्तराङ्गवादी राग, सन्धिप्रकाश राग, परमेल प्रवेशक राग, अष्टवदर्शक स्वर गाउन</p> <p>२.४ दश थाटको रचना नियम बताउन</p>

		<p>विवादी, वर्ज्यस्वर, स्थायी, अन्तरा, मुखडाको अर्थ बताउन</p> <p>२.४. शास्त्रीय रागमा प्रयोग हुने तालहरूको साधारण ज्ञान बताउन</p>		
३.	स्वरलिपि पद्धति	३.१. विष्णुनारायण भातखण्डे र विष्णु दिगम्बर पलुष्करका स्वरलिपि पद्धतिको परिचय दिन	शास्त्रीय रागहरू र सम्बद्ध विद्वान्हरू	<p>३.१. राग भैरव, राग खमाज, राग विहाग, राग आशावरी र राग देशको परिचय दिन</p> <p>३.२. राग भैरव, राग खमाज, राग विहाग, राग आशावरी र राग देशलाई स्वरलिपिमा लेख्ने अभ्यास गर्न</p> <p>३.३. लय, तिहाइ, पूवाङ्गवादी, उत्तराङ्गवादी, राग, थाट, मिड, कण, मुर्की, गमक, खट्काको परिचय दिन</p> <p>३.५. यज्ञराज शर्मा, नरराज ढकाल, गणेशवहादुर भण्डारी, रामप्रसाद राय थारु र शतिसचन्द्र रेग्मीको परिचय दिन</p>
४.	पाश्चात्य सङ्गीत	<p>४.१. पाश्चात्य स्टाफ स्वरलिपि पद्धतिको साधारण ज्ञान बताउन</p> <p>४.२. पाश्चात्य तथा पूर्वीय स्वर नामहरूको तुलनात्मक अध्ययन गर्न</p> <p>४.३. पाश्चात्य सङ्गीतमा प्रयोग हुने क्रोम्याटिक स्केल, डायटोनिक स्केल, मेलोडी, हार्मोनी, कर्ड, ड्रिफ्टका अर्थ बताउन</p> <p>४.४. पाश्चात्य सङ्गीतमा प्रयोग हुने की सिग्नेचर, टाइम सिग्नेचर, नोट, लेजर लाइन, ट्रेबल क्लेफ, बास क्लेफ, लायट, सार्पकोचिहन लेखी अभ्यास गर्न</p>	नेपाली आधुनिक गीत तथा गायन	<p>४.१. नेपाली आधुनिकगीतको परिभाषा, उत्पत्ति, ऐतिहासिक पृष्ठभूमि तथा विकासक्रम बताउन</p> <p>४.२. आधुनिकगीत रेकर्ड गर्ने मेलवादेवी, सेतुराम, रत्नदास प्रकाश, मित्रसेन थापाको सामान्य दिन</p> <p>४.३. आधुनिक गीतमा प्रयोग हुने किबोर्ड, हार्मोनियम, गिटार बजाउन</p>

४. विषयवस्तुको क्षेत्र र क्रम

एकाइ	कक्षा ११			कक्षा १२		
	विषयक्षेत्र	विषयवस्तुको विस्तृतीकरण	कार्य घण्टा	विषयक्षेत्र	विषयवस्तुको विस्तृतीकरण	कार्य घण्टा
१.	नेपाली लोकगीत	१.१ लोकगीत गायनको सामान्य परिचय १.२. झ्याउरे, देउडा, च्याब्रुड, शोर्पा, मैथिली, फागु, मालश्री गीतको परिचय १.३. भाका र लय, बोली, चरण, थैगो, टुक्का, रहनी, फुँदा, भाका टिप्नु, भाका छोप्नु, रहनी, टुप्पा र फेद, दोहरी, जुहारीको परिचय	२४	नेपाली लोकगीत	१.१. नेपाली लोकगीत गायनको ऐतिहासिक विकासक्रम १.२. चुड्के, घाँसे, वसन्त, टप्पा गीत, सालेजु गीत, भोजपुरी गीतको परिचय १.३. हुड्के, घाटुली, देउसे, भैली, रोदी, खलः, डवली, गर्रा, कर्खाको परिचय १.४ हुड्के, घाटुली, देउसे, भैली, रोदी, खलः, डवली, गर्रा, कर्खामा प्रयोग हुने गीत, वाद्यवादन र तालको परिचय १.५. मेलवादेवी, सेतुराम, मित्रसेन थापा, धर्मराज थापाको परिचय	२८
२.	शास्त्रीय गीत	२.१. शास्त्रीय गायनको परिचय र यसका विविध पक्षहरू २.२. राग भूपाली, राग यमन, राग काफी र राग वृन्दावनी सारङ्गको परिचय २.३. ध्वनि, स्वर, आन्दोलन, नाद, श्रुति, थाट, सप्तक, वर्ण, थाट, जाति, राग, वादी, संवादी, विवादी, वर्ज्यस्वर, स्थायी, अन्तरा, मुखडाको परिचय २.४. शास्त्रीय रागमा प्रयोग हुने तालहरूको ज्ञान :	२८	नेपाली शास्त्रीय गायन	२.१. नेपाली शास्त्रीय गायनको ऐतिहासिक विकासक्रम २.२. ख्याल, ठुमरी, गजल, भजनको परिचय २.३ पूवाङ्गवादी राग, उत्तराङ्गवादी राग, सन्धिप्रकाश राग, परमेल प्रवेशक राग, अध्वदर्शक स्वरको परिचय २.४ दश थाटको रचना नियमको परिचय	१८
३.	स्वरलिपि पद्धति	३.१. विष्णुनारायण भातखण्डे र विष्णु दिगम्बर	१०	शास्त्रीय रागहरू र	३.१. राग भैरव, राग खमाज, राग विहाग, राग	१८

		पलुष्करका स्वरलिपि पद्धतिको परिचय		सम्बद्ध विद्वान्हरू	आशावरी र राग देशको परिचय ३.२. राग भैरव, राग खमाज, राग विहाग, राग आशावरी र राग देशलाई स्वरलिपिमा लेखन ३.३. लय, तिहाइ, पूवाङ्गवादी, उत्तराङ्गवादी, राग, थाट, मिड, कण, मुर्की, गमक, खट्काको परिचय ३.५. यज्ञराज शर्मा, नरराज ढकाल, गणेशवहादुर भण्डारी, रामप्रसाद राय थारु र शतिसचन्द्र रेग्मीको परिचय	
४.	पाश्चात्य सङ्गीत	४.१. पाश्चात्य स्टाफ स्वरलिपि पद्धतिको साधारण ज्ञान ४.२. पाश्चात्य तथा पूर्वीय स्वर नामहरूको तुलनात्मक अध्ययन ४.३. पाश्चात्य सङ्गीतमा प्रयोग हुने क्रोम्याटिक स्केल, डायटोनिक स्केल, मेलोडी, हार्मोनी, कर्ड, ड्वेटको परिचय ४.४. की सिग्नेचर, टाइम सिग्नेचर, नोट, लेजर लाइन, ट्रेबल क्लेफ, बास क्लेफ, लायट, सार्पको चिह्न लेख्ने अभ्यास	१८	नेपाली आधुनिक गीत गायन	४.१. नेपाली आधुनिक गीतको परिभाषा, उत्पत्ति र ऐतिहासिक पृष्ठभूमि तथा विकासक्रम ४.२. आधुनिकगीत रेकर्ड गर्ने मेलवादेवी, सेतुराम, रत्नदास प्रकाश, मित्रसेन थापाको परिचय ४.३. आधुनिक गीतमा प्रयोग हुने किबोर्ड, हार्मोनियम र गिटारको परिचय तथा बजाउने अभ्यास	१६
	जम्मा		८०			८०

५. प्रयोगात्मक तथा परियोजना कार्य

यस विषयमा तल उल्लिखित प्रयोगात्मक तथा परियोजना कार्य गराई तिनको अभिलेख राख्नुपर्ने छ । यसका अतिरिक्त शिक्षकले स्थानीय परिवेश अनुरूपका स्थानीय कार्यकलाप समेत गराउन सक्ने छन् ।

कक्षा ११			कक्षा १२		
विषयक्षेत्र	सम्भावित क्रियाकलाप	कार्य घण्टा	विषयक्षेत्र	सम्भावित क्रियाकलाप	कार्य घण्टा
१. नेपाली लोकगीत	<p>१.१. कक्षाकोठा वा विद्यालयको प्राङ्गणमा निम्नलिखित लोकगीत गाउने :</p> <p>झ्याउरे, देउडा, च्याबुङ, शोर्पा, मैथिली, फागु गीत</p> <p>१.२. भातखण्डे स्वरलिपिमा लेखिएका तीनओटा लोक गीतहरू हेरेर वाद्य र तालमा गाउने र शिक्षक वा विज्ञले दिएको सुझाव टिपोट गर्ने</p>	२२	नेपाली लोकगीत	<p>१.१. निम्नलिखित लोकगीतको स्वरलिपि र ताललिपि तयार गरी गाउने र शिक्षकले दिएका सुझाव टिपोट गर्ने :</p> <p>चुडके, घाँसे, बसन्त, सिलु, टप्पा, सालेजु, ख्याली, भोजपुरी, सोरठी</p> <p>१.२. नेपाली लोकगीतमा प्रयोग हुने निम्नलिखित लोक तालहरूलाई तालीमा देखाउने र शिक्षकको सुझाव टिपोट गर्ने :</p> <p>सोरठी ताल, खँजडी ताल, च्याभुङ ताल र समला ताल</p>	२६
२. शास्त्रीय गीत	<p>२.१. राग भूपाली, यमन, दुर्गा, काफीको आलाप, तानसहित मध्यलयमा गाउने र बजाउने तथा गाएको मिति तथा विज्ञको सुझाव टिपोट गर्ने</p> <p>२.२. भातखण्डे स्वरलिपिमा लेखिएका लोक गीतहरू हेरेर वाद्य र तालमा गाउने तथा गाएको मिति तथा विज्ञको सुझाव टिपोट गर्ने</p> <p>२.३. शुद्ध तथा विकृत स्वरमा आधारित दशओटा सामान्य अलङ्कारको अभ्यास गर्ने र अभ्यास गर्दा शिक्षकले दिएको</p>	२८	शास्त्रीय राग	<p>२.१. कक्षाकोठा वा विद्यालयको प्राङ्गणमा राग भैरव, राग खमाज, रागविहाग, रागआशावरीलाई स्वरलिपि र ताललिपिमा लेख्ने/गाउने र शिक्षक वा विज्ञको सुझाव टिपोट गर्ने</p> <p>२.३. आवश्यक अङ्गसहित राग भैरव, राग खमाज, रागविहाग, रागआशावरीलाई दुगुन र तिगुन गरी द्रुत लय र विलम्बित लयमा गाउने</p> <p>२.४. आवश्यक अङ्गसहितसहित ध्रुपद वा धमार गाउने</p> <p>२.५. तानपुरा बजाउने र बजाउने तरिका लेख्ने</p>	२६

	<p>सुभाब टिपोट गरी अभिलेख राख्ने</p> <p>२.३ सुरपेटी हार्मोनियम र तानपुरा बजाउने तथा यी बाजा बजाउने तरिका लेख्ने</p>				
३. पाश्चात्य गायन	<p>३.१. पाश्चात्य स्टाफ स्वरलिपिमा लेखिएको कुनै एक गीत गाउने र शिक्षकले दिएको पृष्ठपोषणका आधारमा गायनका सबल र सुधारापेक्षी पक्ष टिपोट गर्ने</p> <p>३.२. पाश्चात्य तथा पूर्वीय स्वर नामहरूको तुलनात्मक सूची बनाई कक्षामा प्रस्तुत गर्ने</p> <p>३.३. की सिग्नेचर, टाइम सिग्नेचर, नोट, लेजर लाइन, ट्रेबल क्लेफ, बास क्लेफ, लायट र सार्पको लिपि चिह्न तयार पारी कक्षामा प्रस्तुत गर्ने</p>	२०	शास्त्रीय तथा आधुनिक गायन	<p>३.१. थाटमा आधारित अलङ्कारहरूलाई तालमा गाउने र गाउने तरिका लेख्ने</p> <p>३.२. एउटा लोकप्रिय आधुनिकगीत वा राष्ट्रिय गीत वा भजन गीतलाई हार्मोनियम, गिटारसँग गाउने</p>	११
४. लोक, आधुनिक, शास्त्रीय तथा पाश्चात्य ताल	<p>३.१ लोक वाद्यहरूको ताललाई हातमा ताली दिई देखाउने अभ्यास</p> <p>३.२. शास्त्रीय रागमा प्रयोग हुनेताललाई हातमा ताली दिई देखाउने र प्राप्त सुभाब टिपोट गर्ने</p> <p>३.३ हार्मोनियम वा गिटार बजाउने र बजाउने तरिका लेखी प्रस्तुत गर्ने</p>	१०	आधुनिक गीत	<p>४.१. भिन्न दुई कुनै एक तालमा नेपाली आधुनिकगीत गाउने</p> <p>४.२ नारायण गोपाल/प्रेमध्वजद्वारा गाइएको प्रचलित कुनै दुई गीतहरू गाउने</p> <p>४.३ विद्यालयमा गीत गायन प्रतियोगिता आयोजनामा गरी एउटा गीत गाउने र दर्शक तथा विज्ञका प्रतिक्रिया लेख्ने</p>	१७
	जम्मा	६०			६०

५. सिकाइ सहजीकरण प्रक्रिया

यसै पाठ्यक्रमले विद्यार्थीहरूको ज्ञान र सिपका विकासका साथै मानसिक विकास र मनोवृत्तिमा सकारात्मक परिवर्तन ल्याउने मनसाय राखेको छ । यसका लागि शिक्षकले भिन्न भिन्न क्षेत्रमा गईसमसामयिक, शास्त्रीय र पौराणिक गीत सङ्गीत र तिनका गतिविधिहरूमा समावेश भई कार्य पूरा गर्न विद्यार्थीलाई सहयोग गर्नुपर्छ । विद्यालयभित्र र बाहिर पाइने तथा स्थानीय सामग्रीलाई समेत शिक्षण सामग्रीको रूपमा प्रयोग गर्न सकिन्छ । गायन विषयको शिक्षणमा विद्यार्थीहरूले एकल तथा सामूहिक प्रस्तुति र खोजका माध्यमबाट सिकने गतिविधिहरू सञ्चालन गर्नुपर्छ ।

यस विषयको सिकाइ सहजीकरण कार्यलाई प्रभावकारी बनाउन विषयवस्तुको प्रकृतिअनुसार निम्नानुसारका शिक्षण विधि प्रयोगमा ल्याउन सकिन्छ :

(क) छलफल विधि (ख) प्रयोगात्मक विधि (ग) श्रवण विधि (घ) खोज विधि (ङ) परियोजना विधि

(च) मञ्च प्रदर्शन विधि (छ) सोधपुछ विधि (ज) भूमिका निर्वाह विधि (झ) परियोजना तथा प्रस्तुति विधि (ञ) अभ्यास (Drill)

गायन प्रयोगात्मक विषय भएकाले प्रदर्शन, अवलोकन र उपयोगलाई विशेष प्राथमिकता दिनुपर्दछ । सैद्धान्तिक विषयवस्तुको प्रस्तुतिपछि विद्यार्थीहरूलाई यथासम्भव उदाहरण एवम् प्रयोगात्मक कार्य गर्न लगाउनुपर्दछ । सिकाइ सहजीकरण प्रक्रियामा विद्यार्थीमा समझदारी, क्रियात्मक सोचाइ तथा प्रयोगात्मक सिप र अभिवृत्तिको विकास गर्ने क्रियाकलापलाई जोड दिनुपर्छ । सिकाइलाई बोधमा मात्र सीमित नराखी पूर्णता प्रदान गर्नका लागि पर्याप्त अवसर दिई सिर्जनात्मक प्रयोगका लागि मञ्चमा प्रदर्शन गर्नसक्ने अवस्थामा पुऱ्याउनुपर्छ । सिकाइ सहजीकरण कक्षामा उपलब्ध हुन नसक्ने स्थितिमा सम्बन्धित ठाउँमा नै लगेर तिनको प्रयोग र सञ्चालित क्रियाकलाप आवश्यकतानुसार सिकनु र प्रदर्शनसमेत गर्नुपर्छ । शिक्षकले कुनै पनि शिक्षण विधि अपनाउनुभन्दा पहिले विद्यार्थीको बुझ्ने क्षमता र परिपक्वता, आफूले रोजेका विधिहरूबाट अध्यापन सफल हुने विश्वास, सफलता प्राप्तिका लागि विद्यार्थीमा अभिर्ख जागरण, विद्यार्थीमा सिर्जनशील रूपमा विचार गर्ने र सहयोग गर्ने भावना तथा भौगोलिक र स्थानीय स्तरमा उपलब्ध हुने साधन स्रोत तथा विज्ञको प्रयोगसम्बन्धी पक्षमा ध्यान पुऱ्याउनुपर्छ ।

६. विद्यार्थी मूल्याङ्कन

विद्यार्थीको सिकाइ उपलब्धि सुनिश्चित गर्न निर्माणात्मक र निर्णयात्मक दुवै प्रकारको मूल्याङ्कन गर्नुपर्ने छ । विद्यार्थीको सिकाइ उपलब्धि सुधारका लागि कक्षा शिक्षणकै क्रममा कक्षाकार्य, परियोजना कार्य, प्रस्तुतीकरण, उपलब्धि परीक्षा जस्ता क्रियाकलाप गराई सैद्धान्तिक तथा प्रयोगात्मक ज्ञान तथा सिप हासिल गराउन आवश्यक छ । यसको प्रभावकारी रूपमा कार्यान्वयन तथा विद्यार्थीको सिकाइस्तर सुधार गर्न सिकाइ सहजीकरण क्रियाकलापको अभिन्न अङ्गका रूपमा निर्माणात्मक मूल्याङ्कनलाई उपयोग गर्नुपर्छ । निर्माणात्मक मूल्याङ्कनको सिकाइ उपलब्धिको निश्चित भारलाई निर्णयात्मक मूल्याङ्कनमा समेत जोडिने छ ।

पाठ्यक्रमले निर्धारण गरेका उद्देश्यअनुरूप विद्यार्थीहरूले ज्ञान, सिप तथा अभिवृत्ति प्राप्त गर्न सके सकेनन् भन्ने कुरा पत्ता लगाउने महत्त्वपूर्ण संयन्त्र मूल्याङ्कन हो । विद्यार्थीहरूको मूल्याङ्कन गर्दा सिकाइ उपलब्धिहरूलाई ध्यान दिई सक्षमता र सिकाइ उपलब्धिअनुरूप सिकाइको सबै स्तरलाई समेटेर गर्नुपर्दछ । आन्तरिक र बाह्य मूल्याङ्कनमार्फत यस विषयको मूल्याङ्कन हुने छ । मूल्याङ्कनको कुल भारमध्ये ५० प्रतिशत आन्तरिक र ५० प्रतिशत बाह्य मूल्याङ्कन हुने छ । बाह्य मूल्याङ्कनअन्तर्गत लिखित परीक्षा सञ्चालन हुने छ । विद्यार्थी मूल्याङ्कनअन्तर्गत निर्माणात्मक र निर्णयात्मक मूल्याङ्कन दुवै तरिकाबाट नै गरिनेछ । यस विषयका पाठ्यक्रममा समावेश गरिएका तहगत सक्षमताहरू, कक्षागत सिकाइ उपलब्धि र तिनका विषयवस्तुसोसँग सम्बन्धित सिप, सिकाइ सहभागिता र सिकाइसक्रियताका आधारमा विद्यार्थीहरूको सिकाइको मूल्याङ्कन गर्नुपर्दछ ।

(अ) आन्तरिक मूल्याङ्कन

सिकाइका क्रममा विद्यार्थीले के कति सिके भन्ने पक्षको मूल्याङ्कन गरी नसिकेको भए नसिकनुको कारण अन्वेषण गरी पुनः सिकाइन्छ । यस्तो मूल्याङ्कन कक्षाकोठामा सिकाइ सहजीकरण प्रक्रियाकै क्रममा कक्षाकार्य, गृहकार्य, कक्षा सहभागिता, व्यावहारिक परिवर्तन, हाजिरीका आधारमा अभिलेख राख्नुपर्छ । साथै यस क्रममा आवश्यकतानुसार विद्यार्थीलाई तुरुन्त पृष्ठपोषण दिनुपर्छ र विद्यार्थीमा सुधारको वातावरण तयार गरिदिनुपर्छ । यसअन्तर्गत पाठ्यक्रममा निर्धारित विषय क्षेत्र

लगायतका पक्षका आधारमा व्यवहार परिवर्तन, प्राप्त ज्ञान तथा सिपको निरन्तर अभ्यास एवम् उपयोगमा केन्द्रित भई निरन्तर विद्यार्थी मूल्याङ्कन गरी अभिलेख राख्नुपर्दछ ।

गायन विषयमा कक्षा ११ र १२ मा कुल भारमध्ये ५० भार आन्तरिक मूल्याङ्कनहुनेछ । यसको मूल्याङ्कन निम्नानुसार हुने छ :

क्र.सं.	क्षेत्र	अङ्कभार
१.	कक्षा सहभागिता	३
२.	त्रैमासिक परीक्षाको मूल्याङ्कन	६
३.	परियोजना तथा प्रयोगात्मक कार्य, प्रतिवेदन लेखन तथा प्रतिवेदनको प्रस्तुति	१६
४	बाह्य विज्ञद्वारा स्थलगत प्रयोगात्मक कार्य तथा अन्तर्वार्ता	२५
जम्मा		५०

(ख) बाह्य मूल्याङ्कन

कक्षा ११ र १२ मा कुल भारमध्ये ५० प्रतिशत भार बाह्य मूल्याङ्कन हुने छ । कक्षा ११ र १२ प्रत्येक कक्षामा लागि लिइने परीक्षाका लागि पाठ्यक्रम विकास केन्द्रले तयार गरेको विशिष्टीकरण तालिकाअनुसार प्रश्नपत्र निर्माण गर्नुपर्ने छ । यस विषयको परीक्षामा विशेष गरेर ज्ञान/बोध, समस्या समाधान, समालोचनात्मक, सिर्जनासँग सम्बन्धित प्रश्नहरू सोधिनेछन् । पाठ्यक्रमले निर्धारण गरेका उद्देश्यअनुरूप विद्यार्थीहरूले ज्ञान, सिप, अभिवृत्ति प्राप्त गरे नगरेको मूल्याङ्कन गरिन्छ । सबै बाह्य परीक्षामा अक्षराङ्कन पद्धतिको प्रयोग गरिने छ ।

Apiculture and Sericulture

Grades: 11 and 12

**Subject code: Aps. 429 (Grade 11),
Aps. 430 (Grade 12)**

Credit hrs: 5

Working hrs: 160

1. Introduction

Being an agricultural country, apiculture and sericulture are important fields of studies for the Nepali students. Apiculture and sericulture has been offered as one of the optional subjects in grade 11 and 12. This curriculum has been developed to inculcate the basic knowledge to the students on apiculture and sericulture. This course provides the students about the basics of bee keeping skills and knowledge of silkworm rearing. This course aims to enable the students to take care of and manage queen bee, drone bee and worker bee as well as silkworm.

The curriculum includes the contents from two sectors: apiculture and sericulture. The first section consists of the introduction to apiculture, biology, apiaries and its management and the second section consists of the introduction to sericulture, life cycle of silkworm, silkworm rearing and cocoon production technique.

It is Prepared in accordance with the National Curriculum Framework, the curriculum consists of the level-wise competencies, grade-wise leaning outcomes, scope and sequence of contents, suggested practical/project activities, learning facilitation process and student assessment procedure.

2. Level wise Competencies

At the end of grade 12, the students will have the following competencies:

1. Develop knowledge and skill of apiculture and sericulture.
2. Differentiate between different species of honey bees and silkworm.
3. Impart the wider range of technical skill and knowledge, as well as an understanding of the scientific, moral and commercial principles behind the honey bee and silkworm industry.
4. Analyze and interpret quantitative and qualitative ideas on apiculture and sericulture.
5. Understand and apply appropriate techniques and methods necessary to solve problems in honey bee and silkworm industry.
6. Utilize scientific methods to design and execute honey bee and sericulture projects.
7. Use repeatable observations and testable ideas to understand and explain about apiculture and sericulture, and communicate their work professionally, orally and in writing.
8. Be proficient in the use of appropriate technologies in apiculture and sericulture.

3. Grade-wise Learning outcomes

Grade 11		Grade 12	
Content area	Learning outcomes	Content area	Learning outcomes
1. Introduction to Apiculture	1.1 Define apiculture and state its terminologies. 1.2 Explain the importance and scope of apiculture. 1.3 List out different species of bee. 1.4 Overview the status of beekeeping in Nepal. 1.5 Explain the role of bee with respect to environmental perspective and flora conservation .	1. Honeybee products	1.1 Describe social, nutritional, and medical value of honey. 1.2 Discuss the quality parameters of honey for different honeybee species. 1.3 Point out the uses of honey. 1.4 Point out the uses of bee wax. 1.5 Introduction honey storage techniques . 1.6 Identify the parameters for safe storage of honeybee products. 1.7 State precautions to be applied for quality storage of honey products.
2. Biology and Bee Colony	2.1 Illustrate the life cycle of bee. 2.2 Explain the various types of bees. 2.3 Describe about honey bee colony management and flora conservation	2. Bee feeding during dearth period	2.1 Identify artificial feeding materials for honeybee. 2.2 Prepare artificial feed and recognize feeding technique.
3. Apiaries and management	3.1 Describe about site selection for apiary management. 3.2 Write the technique to handle beehive. 3.3 Explain about colonization and stocking. 3.4 Explain about swarming and its management technique. 3.5 Describe about comb management.	3. Rearing Queen bee	3.1 Point out the colony selection criteria for queen rearing. 3.2 Describe the steps for queen rearing. 3.3 Write the natural reproduction in colony. 3.4 State selection criteria for mother stock and builder colony.
4.	4.1 List out the protective	4. Problems	4.1 Gather knowledge about sign

Equipment and foraging	<p>equipment used in honey bee extraction.</p> <p>4.2 Prepare the hive for baiting.</p> <p>4.3 Manage the foraging technique of honey bee.</p>	inhoneybee	<p>symptoms, prevention and treatment related to different diseases of honeybee.</p> <p>4.2 Identify the nature of damage caused by mites and wax moth.</p> <p>4.3 Discuss preventive and control measures related to mite and wax moth.</p> <p>4.4 Identify nature of damage, prevention and control of pests (wasps, hornets, marten, ants and bee eater birds.)</p> <p>4.5 Describe about pesticide poisoning with its sign and symptoms.</p> <p>4.6 Learn about application method of pesticides.</p> <p>4.7 Identify the safe and harmful pesticides for honeybee.</p>
5. Introduction to Sericulture	<p>5.1 Define sericulture and state its terminologies.</p> <p>5.2 Explain the importance and scope of sericulture.</p> <p>5.3 Explain the different species of silkworm.</p>	5. Life cycle of Silkworm	<p>5.1 Identify the stages of silkworm and larva.</p> <p>5.2 Discuss about site selection and rearing equipment in sericulture.</p>

<p>6. Silkworm rearing</p>	<p>6.1 Introduce sericulture. 6.2 Draw the life cycle of silkworm. 6.3 Describe egg procurement and egg incubation. 6.4 Explain the rearing technique of young age silkworm and late age silkworm. 6.5 Explain the process of mounting in silkworm. 6.6 List out economic important insect-pest and disease of silkworm.</p>	<p>6. Mulberry cultivation</p>	<p>5.1 Develop the concept of nursery management. 5.2 select varieties of mulberry for sericulture. 5.3 Establish new mulberry garden. 5.4 Discuss about site selection and plantation for mulberry cultivation. 5.5 Explain the garden management technique for young age silkworm and late age silkworm. 5.6 Prepare mulberry plants from cutting. 5.7 List out insect pest and disease management in silkworm. Describe integrated pest management in mulberry field.</p>
<p>7. Cocoon assessment</p>	<p>7.1 Observe and identify the cocoon quality. 7.2 Explain the characteristics of cocoon. 7.3 Describe the harvesting technique of cocoon and state the management steps in cocoon. 7.4 Gather the technique of grading cocoon. 7.5 List out post-harvest activities in cocoon</p>	<p>7. Silk production</p>	<p>7.1 Define filature. 7.2 Discuss the process of twisting in silkworm. 7.3 Explain degumming process. 7.4 Explain dying and weaving.</p>
		<p>8. Rearing Equipment</p>	<p>8.1 List out required equipment for rearing larva. 8.2 Explain the safe handling of equipment used in silkworm rearing.</p>

4. Scope and Sequence of Content

Unit	Class 11			Class 12		
	Content Area	Content	Working hrs.	Content Area	Content	Working hrs.
11 1	Introduction to Apiculture	1.1 Definition and common terminologies 1.2 Importance and scope 1.3 Different species of bees 1.4 Beekeeping in Nepal 1.5 Role of bee in environment and flora conservation.	5	Honeybee products	1.1 Social, nutritional and medical value of honey 1.2 Quality parameters of honey for different honeybee species 1.3 Use of honey 1.4 Use of bee wax 1.5 Parameters for safe storage of honeybee products 1.6 Precaution during storage for quality	12
22 2	Biology and Bee Colony	2.1 Life cycle 2.2 Types of bees 2.3 Bee colony and management	8	Bee feeding during dearth period	2.1 Artificial feeding materials 2.2 Artificial feed preparation and feeding	5
3 3	Apiaries and management	3.1 Apiary site selection and establishment 3.2 Handling of bees 3.3 Hives, their types and selection 3.4 Colonization and stocking 3.5 Swarming and management 3.6 Combs and their management	20	Rearing Queen bee	3.1 Colony selection criteria for queen rearing 3.2 Methods of queen rearing 3.3 Natural reproduction in colony 3.4 Criteria for selection of mother stock and builder colony	15
4	Equipment and	4.1 Protective wear and equipment	5	Problems in	4.1 Introduction, sign, symptoms,	20

4	foraging	4.2 Baiting 4.3 Foraging of bees 4.4 Safety measures in honey hunting		honey bee	prevention, and treatment of EFB, TSBV, Nosema disease 4.2 Nature of damage caused by mites and wax moth 4.3 Identification of mites and wax moth, its prevention, control and management 4.4 Identification, nature of damage, prevention and control of wasps, hornets, marten, ants and bee eater birds 4.5 Pesticide poisoning, symptoms and sign of pesticide poisoning, method of pesticide application, harmful pesticide for honey bee	
5	Introduction to Sericulture	5.1 Definition 5.1 General terms 5.1 Scope and importance in Nepal 5.1 Different species of silkworms	5	Life cycle of Silkworm	5.1 Life cycle of silkworm 5.1 Stages of silkworm 5.1 Stages of larva	4
6	Silkworm rearing	6.1 Introduction, life cycle and technique of silkworm rearing 6.2 Material management for rearing 6.3 Egg procurement and incubation	21	Mulberry cultivation	6.1 Sapling production and nursery management 6.2 Varieties of mulberry for sericulture 6.3 Site selection and plantation 6.4 Establishment of new mulberry garden	17

		6.4 Young age silkworm rearing 6.5 late age silkworm rearing 6.6 Mature worm and mounting 6.7 Disease and pest management			6.5 Garden management for young age silkworm rearing 6.6 Garden management for late age silkworm rearing 6.7 Production of mulberry plants from cuttings 6.8 Insect pest and disease management 6.9 Integrated pest management in mulberry field	
7	Cocoon assessment	7.1 Introduction to cocoon, cocoon quality and grades 7.2 Characteristics of cocoon 7.3 Cocoon harvesting and management 7.4 Grading of fresh cocoon 7.5 Post-harvest activities	16	Silk Production	7.1 Filature 7.2 Twisting 7.3 Degumming 7.4 Dying 7.5 Weaving	4
8				Rearing Equipment	8.1 Equipment required for rearing larva-preparation and handling of equipment	3
	Total		80			80

Suggested Practical Activities

Practical is integral part of Secondary Education Curriculum. It focuses more on skill development than knowledge building. It consists of project work, group work, presentation, observation, internship etc. Total of 80 hours has been designated to practical activities and will be carried out under the guidance and monitoring of teacher. Following are only sample practical activities, teacher can assign any relevant practical activity as per requirement.

Grade 11			Grade 12		
Content area	Practical Work	Working hrs.	Content area	Practical Work	Working hrs.
Introduction to Apiculture	<ul style="list-style-type: none"> Visit the bee farm near by your school, observe their characteristics and notice differences among them; note down their scientific name; common name and nesting character. 	4	Honeybee products	<ul style="list-style-type: none"> Discuss the necessary requirements for obtaining good queen and prepare a report on it. (student should given detail procedures on the production and management of a new queen in a hive). 	5
Biology and Bee Colony	<ul style="list-style-type: none"> Illustrate the life cycle of honey bee. Differentiate among queen, worker and drone. Observe their behavior, role and function in hive and prepare a short note on queen, worker and drone. 	10	Bee feeding during dearth period	<ul style="list-style-type: none"> Prepare the procedure to be followed for removing honey from honey comb; demonstrate the honey extraction or harvesting technique; write a short report on it. Search different artificial feeding materials through internet; follow the instructions and prepare artificial feeds and prepare a short report. 	11
Apiaries and management	<ul style="list-style-type: none"> While working with bees, gather all knowledge about working procedures and skills necessary on the part of beekeeper; follow step by step procedure about how to 	25	Rearing Queen bee	–	

	<p>handle bee colony. And prepare a short report on it.</p> <ul style="list-style-type: none"> Identify the colonies to be united; Bring distantly placed colonies closer before uniting; Prepare the procedure for joining and separation of colony; Follow the procedure according to the guidelines of the instructor; Prepare report and present to the class. Identify the different parts of bee hive; handle the different parts of bee hive carefully; identify the different parts of bee hive write a short report and submit it to class teacher. 				
Equipment and foraging	<ul style="list-style-type: none"> Write short notes on necessary equipment like smoker, hive tool, bee brush, frame grip etc. 	8	Problems in honey bee	<ul style="list-style-type: none"> Identify different diseases and pest of honey bee, Search their symptom, Prepare a report and submit it to the teacher. Safely follow the best management of disease and pest and write a short report on it. 	15
Introduction to Sericulture	<ul style="list-style-type: none"> Visit a sericulture farm; Observe the larva and amulet of silkworm. Note down body colour, body length of both adult and larva and note down it on a paper. 	4	Life cycle of Silkworm	<ul style="list-style-type: none"> Illustrate the life cycle of silkworm; observe the egg, larva, pupa and adult of silkworm, note down everything on a paper. 	4

	<ul style="list-style-type: none"> • Visit a sericulture farm to learn about rearing house; collect information regarding rearing appliance, appliances used for feeding, cleaning, spinning larva, disinfection and appliances used for maintaining optimum condition; Prepare a report on the same. • Obtaining quality cocoon; student should be briefed about different methods of mounting, Precaution to be maintained like optimum temperature and humidity; transfer ripe worm while mounting. 	15	Mulberry cultivation	<ul style="list-style-type: none"> • Gather knowledge about different methods of propagation; collect all the required materials and follow the procedure clearly; demonstrate the propagation of mulberry. • Prepare nursery bed for mulberry sapling production; prepare the cutting and pre-treat the cutting; Obtain the knowledge about nursery management. • Follow the planting procedure; Place the equal quantities of organic manure, red soil and sand in each pit and a cutting or sapling is planted; Record all the activities on a piece of paper. • Provide the information about safe use of tools and instrument in orchard. Instruct them to follow integrated weed 	45
--	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----	-----------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----

				<p>management practice, mulching, intercropping, pruning etc.</p> <ul style="list-style-type: none"> • Explain the different method of harvesting in classroom; Provide the concept of leaf picking, branch cutting and whole shoot harvest; Spread the knowledge of preservation of leaves and time of harvest. • Visit a silkworm industry and record the observation like area under mulberry cultivation, varieties; total cost of establishment; amount of cocoon produced etc. Prepare a report and submit to teacher. 	
--	--	--	--	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

<p>Cocoon assessment</p>	<ul style="list-style-type: none"> • Visit sericulture farm. Outline the characteristics of defective cocoons. Cocoon quality should be judged by grading shell percent, filament length, reliability and the percentage of defective cocoons. Assess the different types of cocoon and make a record on a piece of paper. • Identify different diseases and pest of silkworm; understood their symptom and management practice; Prepare a report and submit it to the teacher. 	<p>14</p>			
	<p>Total</p>	<p>80</p>			<p>80</p>

Note: The students should keep the record of everything in a file they do as the practical/project works. The same file will be taken as the reference for awarding the marks in the assessment process. The teacher in coordination with the school administration should make necessary arrangements for the field visits as per the requirement.

5. Learning Facilitation Method and Process:

This course aims to provide both the theoretical knowledge and practical skills to the students. To fulfill the same purposes, the teacher must involve the students in classroom activities as well as practical field visits. Here are some suggested methods and techniques to deliver the course.

- Interactive lecture
- Group/individual work
- Field visits
- Demonstration
- Discussion
- Case study
- Question answer
- Practical/project works
- Audio/visual class
- Web surfing
- Project works
- Problem solving.

7. Students Assessment

Assessment is an important aspect of teaching learning process which will both serve the purposes of assessment for learning and assessment of learning. Both formative and summative evaluation will be carried out to measure the students' learning. Formative assessment is mainly to bring improvement in students' learning and is to be carried out on continuous basis. The following strategies are to be utilized for the formative assessment.

- Assessment of students' learning through appropriate technique like question answer, homework
- Presentation of assignments by the students
- Students' participation in discussion
- Project work completion
- Weekly, monthly and trimester tests.

Summative evaluation will be carried out through internal and external evaluation.

A. Internal Evaluation

Students' knowledge, skills and competencies will be measured through internal evaluation in both grades. The internal evaluation carries 50 percent of weightage for final evaluation. The following table shows the criterial for the internal evaluation.

S. N.	Criteria	Marks
1	Classroom participation (Daily attendance, home assignment and class work, participation in learning, participation in other activities)	3
2	Trimester exam (3 marks from each)	6
3	Project work, report and presentation	16
Total		25
4	Practical work and viva-voice by external examiner	25
Grand total		50

B. External Evaluation

External evaluation of the students will be based on the written examination. It carries 50% of the total weightage. The types and number of question will be as per the test specification chart developed by the Curriculum Development Centre.

सौन्दर्य तथा केशकला शिक्षा

कक्षा : ११ र १२

विषय सङ्केत : Beh.431 (कक्षा ११), Beh.432 (कक्षा १२)

पाठ्यघण्टा : ५

वार्षिक कार्यघण्टा : १६०

१. परिचय

व्यक्तिका शारीरिक अङ्गप्रत्यङ्गहरूको स्वस्थता, सरसफाइ, व्यवस्थापन र शृङ्गारलाई सौन्दर्य कलाका प्रमुख आधारहरूका रूपमा लिइन्छ । विद्यार्थीहरूलाई आफ्ना अङ्गप्रत्यङ्गहरूको उचित हेरचाह गर्नुका साथै तिनीहरूको स्वस्थता र सुन्दरता कायम राख्न, आफूलाई शारीरिक रूपमा तन्दुरुस्त राखी आफ्नो व्यक्तित्वमा निखार ल्याउन र आफूले प्राप्त गरेका सिकाइ अनुभवहरूलाई जीविकोपार्जन र व्यावसायिकतातर्फ उन्मुख गर्न सक्षम बनाउने उद्देश्यले सौन्दर्य तथा केशकला शिक्षा विषयको यो पाठ्यक्रम तयार गरिएको छ । राष्ट्रिय पाठ्यक्रम प्रारूप, २०७६ को मार्गदर्शनबमोजिम विद्यालय शिक्षाको माध्यमिक तह (कक्षा ११ र १२) मा विकसित यस पाठ्यक्रममा शिरदेखि पाउसम्मका विभिन्न बाह्य अङ्गहरूको उचित र व्यवस्थित रूपविन्याससम्बद्ध विषयवस्तुहरूलाई समावेश गरिएको छ । सौन्दर्य तथा केशकला शिक्षा विषयको यस पाठ्यक्रमको अध्ययनपश्चात् विषयवस्तुको विशिष्ट तथा समीक्षात्मक ज्ञान र प्रयोगमा सक्षम बनाउने अपेक्षा राखिएको छ । यसका साथै यस पाठ्यक्रमले सम्बन्धित विषयमा उच्च शिक्षाको आधारसमेत तयार गर्ने अपेक्षा छ ।

सौन्दर्यकला तथा केशकला शिक्षाको यस पाठ्यक्रममा विकास गर्दा सौन्दर्य कलाको परिचय, पोषण र सन्तुलित भोजन, डेपिलेसन र एपिलेसन, हातखुट्टाको सौन्दर्य, केशको स्याहार र शृङ्गार, कपालमा रसायन र रङको प्रयोग, मेनिक्चोर, पेडिक्चोर र नङको स्याहार, छालाको स्याहार, किलिन्जिड, अनुहारको शृङ्गार, फेसियल, स्पा र मसाज थेरापी, मेहन्दी जस्ता विषयवस्तु समावेश गरिएको छ । यस पाठ्यक्रमको कार्यान्वयनका सन्दर्भमा शिक्षकले यस पाठ्यक्रमको विद्यार्थीहरूमा समयको क्रमसँगै परिवर्तित रुचि र माग अनुसारका विषयवस्तुसँग सम्बन्धित समसामयिक ज्ञान, सिप र दक्षताको अद्यावधिक रूपमा विकास गर्ने तर्फ विशेष ध्यान दिने र विद्यालयले पठनपाठन र प्रयोगात्मक अभ्यासका लागि पूर्वाधार र उपयुक्त वातावरण तयार गर्ने छुन भन्ने अपेक्षा गरिएको छ । यस पाठ्यक्रममा उल्लिखित विषयवस्तुमा सैद्धान्तिक तथा प्रयोगात्मक पक्षको सिकाइ गर्न विद्यार्थीकेन्द्रित सिकाइ सहजीकरण विधि तथा प्रक्रियामा जोड दिइएको छ । यसबाट विषयवस्तुमा आधारित भई प्रयोगात्मक क्रियाकलाप, स्थलगत अध्ययन भ्रमण, परियोजना कार्य, खोजमूलक निरन्तर सिकाइ, सिकाइ र मूल्याङ्कनक पद्धतिलाई व्यावहारिक तथा प्रयोगपरक बनाउन सहज हुने अपेक्षा गरिएको छ । यस पाठ्यक्रमले ज्ञान पक्षमा भन्दा पनि सिप तथा अभिवृत्तिमा जोड दिई विषयको अध्ययनलाई व्यावहारिक र प्रयोगात्मक बनाउने प्रयास गरेको छ । सौन्दर्यकला तथा केशकला शिक्षामा आएका नयाँ नयाँ अवधारणा र परिवर्तित प्रविधि र पद्धतिलाई समेत ध्यान दिएर यो पाठ्यक्रम तयार गरिएको छ । यसर्थ सौन्दर्यकला तथा केशकला विषयको पाठ्यक्रम विकास गर्दा उल्लिखित विषयवस्तुको अवधारणा विकास, अभ्यास र निरन्तर सिकाइ तथा मूल्याङ्कनबिचको सन्तुलन कायम गरिएको छ ।

यस पाठ्यक्रममा पाठ्यक्रम विकासको विषयगत औचित्य, पाठ्यक्रममा रहेका मुख्य विशेषता तथा पाठ्यक्रमको स्वरूपलाई समेटी परिचय, विषयगत रूपमा अपेक्षित ज्ञान, सिप, अभिवृत्ति, मूल्य र कार्य तत्परतालाई समेटी त्यसको क्रियात्मक स्वरूपमा सक्षमता, सिकाइको स्तर र सक्षमताको विशिष्टीकृत विस्तृतीकरण गरी सिकाइ उपलब्धि, सक्षमता, सिकाइ उपलब्धि एवम् अधिल्ला कक्षासँग लम्बीय सन्तुलनका आधारमा विषयवस्तुको क्षेत्र र क्रम, विषयगत विशिष्टपन र मौलिकतालाई समेटी सिकाइ सहजीकरणका विधि तथा प्रक्रिया प्रस्तुत गरिएको छ । यसमा निर्माणात्मक र निर्णयात्मक मूल्याङ्कनका विधि तथा प्रक्रियासमेत उल्लेख गरी विद्यार्थी मूल्याङ्कनलाई व्यवस्थित गरिएको छ ।

२. तहगत सक्षमता

माध्यमिक तह (कक्षा ११-१२) को अध्ययन गरेपछि विद्यार्थीहरूले निम्नलिखित सक्षमताको विकास गर्ने छन् :

१. सौन्दर्यकलाका आधारभूत विषयवस्तु तथा सिपको बोध र व्यवहारमा प्रयोग

२. पोषण र सन्तुलित भोजनको महत्त्वको बोध र दैनिक व्यवहारमा उपयोग

३. शरीरमा रहेका अनावश्यक रौंहरू हटाउने विधिको प्रयोग
४. हात तथा खुट्टाको सौन्दर्य र नङको शृङ्गार विधिको बोध र प्रयोग
५. प्रकार र वर्णअनुसार छालाको सुरक्षा, स्याहार तथा सौन्दर्य एवम् शृङ्गार सिप पहिचान र उपयोग
६. केशको स्याहार, कटिङ र शृङ्गार विधिहरूको बोध र व्यवहारमा उपयोग
७. फेसियलका उपयुक्त विधिहरूको छनोट र व्यवहारमा प्रयोग
८. मेहन्दीको तयारी र प्रयोग
९. शारीरिक समस्या समाधानका लागि स्या र मसाजको प्रयोग

३. कक्षागत सिकाइ उपलब्धि

कक्षा ११ र १२ माको अध्ययनपश्चात् विद्यार्थीहरूले निम्नलिखित उपलब्धिहरू हासिल गर्न सक्षम हुने छन् :

कक्षा ११		कक्षा १२	
विषयक्षेत्र	सिकाइ उपलब्धि	विषयक्षेत्र	सिकाइ उपलब्धि
१. सौन्दर्य तथा केशकलाको परिचय	<p>१.१ सौन्दर्य र केशकलाको परिचय दिई यिनको महत्व र आवश्यकता वर्णन गर्न</p> <p>१.२ सौन्दर्य शास्त्रसँग सम्बन्धित विषयक्षेत्रहरूको परिचय दिन र तिनीहरू बिचको अन्तरसम्बन्ध पहिचान गर्न</p> <p>१.३ सौन्दर्य शास्त्र (Aesthetics), सौन्दर्य प्रसाधन (Cosmetics) र सौन्दर्य प्रसाधन शास्त्र (Cosmatology) को परिचय दिन</p>	१. सौन्दर्य तथा केशकलाको परिचय	<p>१.१ नेपालमा सौन्दर्यकला तथा केशकलाको प्रयोगको विगत र वर्तमान अवस्थाको तुलना गर्न</p> <p>१.२ सौन्दर्यकला र केशकलामा प्रयोग गरिने साधनहरूको सूची बनाउन र तिनीहरूको प्रयोग विधि उल्लेख गर्न</p> <p>१.३ आफ्नो बसोबास रहेको स्थानमा सौन्दर्यकला तथा केशकलाको बजारको पहिचान गर्न</p> <p>१.४ सौन्दर्य प्रसाधन तथा केश विन्याससम्बन्धी सेवा प्रदान गर्न</p> <p>१.५ ब्युटी स्यालोनको व्यवस्थापन गर्ने तरिका उल्लेख गरी व्यावहारिक रूपमा प्रयोग गर्न</p>
२. पोषण, सन्तुलित भोजन र व्यायाम	<p>२.१ पोषण, सन्तुलित भोजन र व्यायाम परिचय दिन</p> <p>२.२ शारीरिक सौन्दर्यका लागि पोषण, सन्तुलित भोजन र व्यायामको महत्त्व र आवश्यकता वर्णन गर्न</p> <p>२.३ स्वस्थ छाला र कपालका लागि पोषण र सन्तुलित भोजनको महत्त्व प्रस्तुत गर्न</p> <p>२.४ सन्तुलित भोजनमा हुनुपर्ने तत्वहरूको सूची बनाई तिनीहरूले</p>	२. शरीरका अनावश्यक रौं हटाउने तरिका	<p>२.१ डेपिलेसन र एपिलेसनको परिचय दिन र यसको उपयोगिता वर्णन गर्न</p> <p>२.२ डेपिलेसन र एपिलेसनका लागि आवश्यक सामग्रीहरूको सूची बनाउन र तिनीहरूको प्रयोग विधिको वर्णन गर्न</p> <p>२.३ डेपिलेसन र एपिलेसन विधिको प्रयोग गरी शरीरका अनावश्यक रौं हटाउने तरिका वर्णन गर्न र</p>

	<p>गर्ने काम र ती तत्त्वहरू पाइने स्रोतहरूको सूची बनाउन</p> <p>२.५ किशोरकिशोरी, गर्भवती महिला र प्रौढ व्यक्तिहरूका लागि सन्तुलित भोजनको विवरण तालिकामा प्रस्तुत गर्ने</p> <p>२.६ शारीरिक सुन्दरताका लागि शारीरिक व्यायाम एवम् योगको आवश्यकता र महत्त्व बताउन</p> <p>२.७ शारीरिक सुन्दरता बढाउने योगका आसन तथा व्यायामहरूको पहिचान गर्ने</p>		<p>व्यवहारमा प्रयोग गर्ने</p> <p>२.४ श्रेडिडका लागि आवश्यक सामग्रीहरूको सूची बनाउन र तिनीहरूको प्रयोग विधि वर्णन गर्ने</p> <p>२.५ श्रेडिडको परिचय दिन र यसको प्रयोग गर्ने तरिका वर्णन गर्ने र व्यवहारमा प्रयोग गर्ने</p> <p>२.६ अनुहारको संरचनाअनुसार आँखीभौँका विभिन्न सेपहरू बनाउने सिप प्रदर्शन गर्ने</p>
३. प्राथमिक उपचार, सरसफाइ र निर्मलीकरण	<p>३.१ सौन्दर्य प्रसाधन कार्यका लागि प्राथमिक उपचारको आवश्यकता र महत्त्व बोध गरी यसका विधिहरूको प्रयोग गर्ने सिपको विकास गर्ने</p> <p>३.२ प्राथमिक उपचारको किटबक्स तयार गर्ने</p> <p>३.३ सौन्दर्यका लागि व्यक्तिगत र सामूहिक सरसफाइ एवम् कार्यकक्षको सरसफाइको महत्त्व वर्णन गर्ने र व्यवहारमा प्रयोग गर्ने</p> <p>३.४ निर्मलीकरणको परिचय दिन र यसको आवश्यकता र महत्त्व वर्णन गर्ने</p> <p>३.४ सौन्दर्य सामग्रीहरूको निर्मलीकरणका विधि तथा तरिकाहरूको वर्णन र प्रयोग गर्ने</p>	३. हात र खुट्टाको शृङ्गार	<p>३.१ हात र खुट्टाको शृङ्गार परिचय दिन र यसको आवश्यकता वर्णन गर्ने</p> <p>३.२ हातखुट्टाको शृङ्गारका लागि आवश्यक सामग्रीहरूको प्रयोग गर्ने तरिका वर्णन गर्ने</p> <p>३.३ हातखुट्टाको शृङ्गारका लागि आवश्यक घरेलु सामग्रीको तयारी र प्रयोग गर्ने</p>
४. शरीरका अनावश्यक रौँ हटाउने तरिका	<p>४.१ डेपिलेसन र एपिलेसनको परिचय दिई यिनको महत्त्व र आवश्यकता वर्णन गर्ने</p> <p>४.२ शरीरका अनावश्यक रौँ हटाउन डेपिलेसन विधिको प्रयोग गर्ने</p> <p>४.३ शरीरका अनावश्यक रौँ हटाउन एपिलेसन विधिको प्रयोग गर्ने</p> <p>४.४ शरीरका अनावश्यक रौँ हटाउने घरेलु उपायहरूको पहिचान गरी उपयोग गर्ने</p>	४. केश काट्ने र केशको शृङ्गार	<p>४.१ केश कटिड तथा केशको शृङ्गारको परिचय दिन र यसको महत्त्व प्रस्तुत गर्ने</p> <p>४.२ केश कटिडका लागि आवश्यक सामग्रीहरूको सूची बनाउन र तिनीहरूको प्रयोग गर्ने तरिका वर्णन गर्ने</p> <p>४.३ विभिन्न तरिकाले केश कटिड गर्ने सिपको विकास गर्ने</p> <p>४.४ केश शृङ्गार परिचय दिन र</p>

			<p>यसको महत्त्व उल्लेख गर्न</p> <p>४.५ केश शृङ्गारका लागि आवश्यक सामग्रीहरूको सूची तयार गरी तिनीहरूको प्रयोग विधि प्रस्तुत गर्न</p> <p>४.६ उपयुक्त तरिकाले केश शृङ्गारका सामग्रीहरू प्रयोग गर्ने सिप प्रदर्शन गर्न</p> <p>४.७ विभिन्न प्रकारका जुरोहरू बनाउन</p> <p>४.८ स्थानीय संस्कृति तथा प्रचलन अनुसारको केश कटिड र केश शृङ्गारका तरिकाहरूको पहिचान र प्रयोग गर्न</p>
५. हातखुट्टाको शृङ्गार	<p>५.१ हातखुट्टाको शृङ्गारको परिचय दिई यसको आवश्यकता र महत्त्व उल्लेख गर्न</p> <p>५.२ हातखुट्टाको शृङ्गारका लागि आवश्यक सामग्रीको सूची बनाउन</p> <p>५.३ हातखुट्टाको सौन्दर्यका विधि तथा प्रक्रियाहरूको वर्णन गर्न र व्यवहारमा प्रयोग गर्न</p> <p>५.४ नङको शृङ्गारको परिचय दिन र यसको आवश्यकता र महत्त्व उल्लेख गर्न</p> <p>५.५ नङको बनावट तथा प्रकारको वर्णन गर्न</p> <p>५.६ नङ शृङ्गारका विभिन्न तरिकाहरूको वर्णन गर्न र व्यवहारमा प्रयोग गर्न</p> <p>५.७ हातखुट्टाको सौन्दर्यका लागि घरेलु उपायहरूको पहिचान गर्न र व्यवहारमा प्रयोग गर्न</p>	५. फेसियल	<p>५.१ फेसियलको परिचय दिई यसको आवश्यकता र महत्त्व वर्णन गर्न</p> <p>५.२ फेसियलका लागि आवश्यक सामग्रीहरूको सूची तयार गर्न र तिनीहरूको प्रयोग विधि उल्लेख गर्न</p> <p>५.३ विभिन्न प्रकारका छालाको पहिचान गर्न र छालाको प्रकृतिअनुसार उपयुक्त तरिका अपनाई फेसियल गर्न</p> <p>५.४ अनुहारको छालाका विभिन्न समस्याहरूको पहिचान गर्न र ती समस्याहरूको उपयुक्त तरिका अपनाई समाधान गर्न</p> <p>५.५ घरेलु उपचार पद्धतिअनुसार अनुहारको छालाका विभिन्न समस्याहरूको समाधान गर्न</p>
६. केशको स्याहार र शृङ्गार	<p>६.१ केशको परिचय दिन र यसका कार्यहरू प्रस्तुत गर्न</p> <p>६.२ केशको रचना (Anatomy) वर्णन गर्न र विभिन्न प्रकारहरूका केशहरूको पहिचान गर्न</p>	६. अनुहारको शृङ्गार	<p>६.१ अनुहारको शृङ्गारको परिचय दिन र यसको महत्त्व वर्णन गर्न</p> <p>६.२ उपयुक्त तरिका अपनाई अनुहारको छालाको प्रकृति र वर्ण पहिचान गर्न</p>

	<p>६.३ केशको स्याहारको लागि आवश्यक सामग्रीहरूको सूची बनाउन र प्रयोग गर्न</p> <p>६.४ केश स्याहारका घरेलु उपायहरूको पहिचान र प्रयोग गर्न</p> <p>६.५ केशका विभिन्न समस्याहरू उल्लेख गरी समाधानका उपायहरू अवलम्बन गर्न</p> <p>६.६ स्याम्पु, कन्डिसनर र ब्लोड्राइको उपयोगिता उल्लेख गर्न र उचित प्रयोग गर्न</p> <p>६.७ केशको स्याहारका तरिकाहरूको पहिचान र प्रयोग गर्न</p> <p>६.८ केशको शृङ्गारको परिचय दिन र यसको आवश्यकता र महत्त्व उल्लेख गर्न</p> <p>६.९ केश शृङ्गारको लागि आवश्यक सामग्रीहरूको सूची बनाई प्रयोग गर्ने तरिका उल्लेख गर्न</p> <p>६.१० रोलरद्वारा कपाल सेट गर्ने तरिका उल्लेख गर्न र व्यवहारमा प्रयोग गर्न</p> <p>६.११ एकल चुल्ठो, माछी काँडा, साइड बेन्ड आदि तरिकाले कपाल बाट्ने सिपको व्यवहारमा प्रयोग गर्न</p> <p>६.१२ फ्रेन्च नटजुरो, लोबन जुरो, मेस्सी जुरोलगायतका जुरो बनाउने तरिका उल्लेख गर्न र उक्त प्रकारका जुरो बनाउने सिपको व्यवहारमा प्रयोग गर्न</p> <p>६.१३ नक्कली जुरो लगाउने तरिका (स्विच फिक्सिड) उल्लेख गर्न र व्यवहारमा प्रयोग गर्न</p> <p>६.१४ नक्कली कपाल लगाउने तरिका (बिग फिक्सिड) उल्लेख गर्न र व्यवहारमा प्रयोग गर्न</p>		<p>६.३ अनुहारको छालाको प्रकृति र वर्णअनुसारको शृङ्गार गर्ने सिपको प्रदर्शन गर्न</p> <p>६.४ शृङ्गारका लागि उपयुक्त उत्पादनको छनोट तथा प्रयोग गर्न</p> <p>६.५ आधारभूत शृङ्गारको प्रक्रिया वर्णन गर्न</p> <p>६.६ विभिन्न प्रकारका शृङ्गारको वर्णन गर्न र शृङ्गार गर्ने सिपको प्रदर्शन गर्न</p> <p>६.७ स्थानीय संस्कृति र प्रचलनअनुसारको अनुहारको शृङ्गारका विभिन्न तरिकाहरूको पहिचान गरी प्रयोग गर्न</p>
<p>७. छालाको स्याहार</p>	<p>७.१ छालाको परिचय दिन र यसको बनावट तथा कार्यहरू उल्लेख गर्न</p> <p>७.२ विभिन्न किसिमका छालाको पहिचान</p>	<p>७. स्या र मसाज थेरापी</p>	<p>७.१ नेपालमा स्याको परिचय दिन र यसको प्रयोगको विगत र वर्तमान अवस्थाको तुलना गर्न</p>

	<p>गर्न</p> <p>७.३ छालाको स्याहार गर्ने विभिन्न विधिहरू उल्लेख गर्न</p> <p>७.४ छालाको स्याहार गर्ने घरेलु र प्राकृतिक उपायहरू पहिचान गरी प्रयोग गर्न</p> <p>७.५ क्लिन्जिङको परिचय दिन र यसको आवश्यकता तथा महत्त्व उल्लेख गर्न</p> <p>७.६ क्लिन्जिङका लागि आवश्यक सामग्रीहरूको सूची तयार गरी प्रयोग गर्ने तरिका उल्लेख गर्न</p> <p>७.७ क्लिन्जिङका प्रकारहरू, क्लिन्जिङ गर्ने तरिका र यसको प्रयोग गर्दा अपनाउनुपर्ने सावधानीका उपायहरू वर्णन गर्न र व्यवहारमा प्रयोग गर्न</p> <p>७.८ ब्लिच गर्ने तरिका उल्लेख गर्न र व्यवहारमा प्रयोग गर्न</p> <p>७.९ छालाको प्रकृतिअनुसारको विधि प्रयोग गरी छालाको स्याहार गर्ने तरिका उल्लेख गर्न र व्यवहारमा प्रयोग गर्न</p>		<p>७.२ नेपालमा यसको प्रयोगको विगत र वर्तमान अवस्थाको समीक्षा गर्न</p> <p>७.३ स्पाको प्रयोगद्वारा गरिने उपचार विधिको वर्णन गर्न</p> <p>७.४ मसाजको उपयोगिता र प्रकारहरू वर्णन गर्न र विभिन्न तरिकाले मसाज गर्ने विधिको वर्णन र व्यवहारमा प्रयोग गर्न</p>
<p>८. अनुहारको शृङ्गार</p>	<p>८.१ अनुहारको शृङ्गारको परिचय दिन र यसको महत्त्व वर्णन गर्न</p> <p>८.२ छालाको वर्णको पहिचान गर्न</p> <p>८.३ प्राकृतिक अनुहारलाई आकर्षित बनाउने तरिका उल्लेख गर्न र व्यवहारमा प्रयोग गर्न</p> <p>८.४ अनुहारको आकारको पहिचान गरी उपयुक्त विधि अपनाई अनुहारको शृङ्गार गर्न</p>	<p>८. मेहन्दी</p>	<p>८.१ मेहन्दीको परिचय दिन र यसको महत्त्व र उपयोगिता वर्णन गर्न</p> <p>८.२ मेहन्दी लगाउँदा प्रयोग गरिने सामग्रीहरूको सूची तयार गरी तिनीहरूको प्रयोग गर्ने तरिका वर्णन गर्न</p> <p>८.३ मेहन्दी बनाउने विभिन्न तरिकाहरूको वर्णन गर्न र प्रदर्शन गर्न</p> <p>८.४ उपचार र कलाको रूपमा मेहन्दीको प्रयोग गर्ने विधिहरूको उल्लेख गर्न र विधिहरूको व्यवहारमा प्रयोग गर्न</p> <p>८.५ मेहन्दी प्रयोगका प्रकारहरूको वर्णन गर्न र व्यवहारमा प्रयोग गर्न</p>

९. स्या	९.१ स्याको परिचय दिन र यसको महत्त्व प्रस्तुत गर्न ९.२ स्याका लागि आवश्यक विभिन्न साधनको पहिचान गर्न र उपयोग गर्न	९. कपालमा रसायन र रङको प्रयोग	९.१ कपालमा लगाउने रसायन र रङहरूको परिचय दिन ९.२ कपालमा रङ र रसायनको प्रयोग गर्नुपर्ने कारणहरू उल्लेख गर्न ९.३ कपालमा रङ र रसायनको प्रयोग गर्ने विभिन्न तरिकाहरूको वर्णन गर्न र व्यवहारमा प्रयोग गर्न ९.४ कपालमा रसायन र रङको प्रयोग गर्दा सावधानीका तरिकाहरू अपनाउन
------------	---------------------------------------------------------------------------------------------------------------------	----------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

४. विषयवस्तुको क्षेत्र र क्रम

कक्षा ११			कक्षा १२		
विषयक्षेत्र	विषयवस्तुको विस्तृतीकरण	कार्य घण्टा	विषयक्षेत्र	विषयवस्तुको विस्तृतीकरण	कार्य घण्टा
१. सौन्दर्य तथा केशकलाको परिचय	१.१ सौन्दर्य शिक्षा र केशकलाको अवधारणा १.२ सौन्दर्य शिक्षा र केशकलाको महत्त्व र आवश्यकता १.३ सौन्दर्यशास्त्रसँग सम्बन्धित विषयक्षेत्रहरूको परिचय र तिनीहरूबिचको अन्तरसम्बन्ध १.४ सौन्दर्यशास्त्र (Aesthetics), सौन्दर्य प्रसाधन (Cosmetics) र सौन्दर्य प्रसाधन शास्त्र (Cosmatology) को परिचय	५	१. सौन्दर्य तथा केशकलाको परिचय	१.१ नेपालमा सौन्दर्य तथा केशकलाको विगत र वर्तमान अवस्था १.२ सौन्दर्य र केशकलामा प्रयोग गरिने साधनहरू १.३ सौन्दर्य तथा केशकलाको बजारको जानकारी, पहिचान र व्यवसायको व्यवस्थापन	५
२. पोषण, सन्तुलित भोजन र व्यायाम	२.१ पोषण र सन्तुलित भोजन २.१.१ परिचय र आवश्यकता २.१.२ सौन्दर्य कलामा पोषण र सन्तुलित भोजनको महत्त्व २.१.३ स्वस्थ छाला र कपालका लागि पोषण र सन्तुलित	१०	२. शरीरका अनावश्यक रौं हटाउने तरिका	२.१ डेपिलेसन २.१.१ डेपिलेसनको परिचय २.१.१ डेपिलेसनको उपयोगिता २.१.२ डेपिलेसनका लागि आवश्यक सामग्रीहरू	८

	<p>भोजनको महत्त्व</p> <p>२.१.४ सन्तुलित भोजनमा हुनुपर्ने तत्वहरू : कार्बोहाइड्रेट, प्रोटीन, मिनिरल्स, चिल्लो पदार्थ, भिटाभिन र पानी</p> <p>२.१.५ उमेर समूहअनुसार सन्तुलित भोजनको तालिका निर्माण</p> <p>२.२ शारीरिक व्यायाम र योग</p> <p>२.२.१ सुन्दरताका लागि व्यायाम र योगको आवश्यकता र महत्त्व</p> <p>२.२.२ शारीरिक सुन्दरता बढाउने योगका आसन तथा व्यायामहरू</p>			<p>२.१.३ डेपिलेसन विधिको प्रयोग</p> <p>२.२ एपिलेसन</p> <p>२.२.१ एपिलेसनको परिचय</p> <p>२.२.२ एपिलेसनको उपयोगिता</p> <p>२.२.३ एपिलेसनका लागि आवश्यक सामग्रीहरू</p> <p>२.२.४ एपिलेसन विधिको प्रयोग</p> <p>२.२.५ श्रेडिङको परिचय</p> <p>२.२.६ श्रेडिङका लागि आवश्यक सामग्रीहरू</p> <p>२.२.७ श्रेडिङको प्रयोग</p> <p>२.२.८ अनुहारको संरचनाअनुसार आँखीभौँका सेपहरू -सिधा सेप, यु सेप, भी सेप, राउन्ड सेप, आर्क सेप, बो सेप</p>	
३. प्राथमिक उपचार, सरसफाइ, र निर्मलीकरण	<p>३.१ प्राथमिक उपचार</p> <p>३.१.१ प्राथमिक उपचारको परिचय</p> <p>३.१.२ प्राथमिक उपचारका विधिहरू</p> <p>३.२ सरसफाइ</p> <p>३.२.१ शरीरको हेरचाह र सरसफाइ : दाँत, रौँ, नङ, हातखुट्टा लगायत शरीरका विभिन्न अङ्गहरूको हेरचाह र सरसफाइ</p> <p>३.२.२ व्यक्तिगत सरसफाइ</p> <p>३.२.३ सामूहिक सरसफाइ</p> <p>३.२.४ शारीरिक सौन्दर्यका लागि सरसफाइको महत्त्व</p> <p>३.३ निर्मलीकरण</p> <p>३.३.१ निर्मलीकरणको परिचय</p> <p>३.३.२ सौन्दर्य सामग्रीहरूको निर्मलीकरणको</p>	५	३. हातखुट्टाको शृङ्गार	<p>३.१ हातको शृङ्गार</p> <p>३.१.१ मेनिक्चोरको परिचय र आवश्यकता</p> <p>३.१.२ मेनिक्चोरका लागि आवश्यक सामग्रीहरू (बाटा, ब्रस, स्याम्पु, टावेललगायत : आवश्यकताअनुसार)</p> <p>३.१.३ मेनिक्चोरको प्रयोग</p> <p>३.१.४ मेनिक्चोरका लागि आवश्यक घरेलु सामग्रीको तयारी र प्रयोग</p> <p>३.२ खुट्टाको सौन्दर्य</p> <p>३.२.१ पेडिक्चोरको परिचय र आवश्यकता</p> <p>३.२.२ पेडिक्चोरका लागि आवश्यक सामग्रीहरू</p> <p>३.२.३ पेडिक्चोरको प्रयोग</p> <p>३.२.४ पेडिक्चोरका लागि आवश्यक घरेलु सामग्रीको</p>	१०

	आवश्यकता र महत्त्व ३.३.३ सौन्दर्य सामग्रीहरूको निर्मलीकरणका विधि र तरिकाहरू			तयारी र प्रयोग	
४. शरीरका अनावश्यक रौं हटाउने तरिका	४.१ डेपिलेसन र एपिलेसनको परिचय र आवश्यकता ४.२ डेपिलेसन विधि (रेजर, हेयर रिमुभिड क्रिम, हेयर रिमुभिड साबुन) ४.३ एपिलेसन विधि (थ्रेडिङ, वाक्सिङ) ४.३.१ वाक्सिङको विधिहरू (हट वाक्स, कोल्ड वाक्स) ४.३.२ शरीरका अनावश्यक रौं हटाउने घरेलु उपायहरू	८	४. केश काट्ने र केशको शृङ्गार	४.१ केश कटिङ ४.१.१ परिचय र महत्त्व ४.१.२ केश कटिङअनुसार केश विभाजन ४.१.३ केश कटिङका लागि आवश्यक सामग्रीहरू (सेक्सन पिन, स्याम्पु कम्ब, टेलिकम्ब, सेल्फ एप्रोन क्लाइन्ट एप्रोन, कैंची, स्प्रे बोटल, टेलकम पाउडर, कोट ब्रस, हार्डब्रस, सफ्ट ब्रस आदि) ४.१.४ केश कटिङ तरिकाहरू (वन लेन्थ हेयर कट, युसेभ कट, भिसेभ कट, स्टेप कट, ब्वाइज कट, मसरुम कट, थाइ कट) ४.२ केश शृङ्गार ४.२.१ परिचय र महत्त्व ४.२.२ केश शृङ्गारका लागि आवश्यक सामग्रीहरू (स्टोन पिन, लावर पिन, ताज गजरा, डिजाइन पिन गिलटर पिन आदि) ४.२.३ जुरोका प्रकारहरू (पार्टि जुरो, मेस्सी जुरो, स्पेसल ब्राइडल जुरो) ४.३ स्थानीय संस्कृति र प्रचलनअनुसारको केश कटिङ र केश शृङ्गारका तरिकाहरू	१५
५. हातखुट्टाको शृङ्गार	५.१ हातखुट्टाको सौन्दर्य ५.१.१ परिचय, आवश्यकता र महत्त्व	८	५. फेसियल	५.१ फेसियल ५.१.१ परिचय, आवश्यकता र महत्त्व	१०

	<p>५.१.२ हातखुट्टाको सौन्दर्यका लागि आवश्यक सामग्री</p> <p>५.१.३ हातखुट्टाको सौन्दर्यका विधि तथा प्रक्रिया (मेनिक्चोर, पेडिक्योर)</p> <p>५.२ हातखुट्टाको सौन्दर्यका लागि घरेलु उपायहरू</p> <p>५.३ नङको शृङ्गार</p> <p>५.३.१ परिचय, आवश्यकता र महत्त्व</p> <p>५.३.२ नङको बनावट</p> <p>५.३.३ नङका प्रकार : प्राकृतिक र बनावटी नङ</p> <p>५.३.४ नङ शृङ्गारका विभिन्न तरिका</p> <p>५.३.५ कृत्रिम नङको शृङ्गार (जेल नेल, टिप्नेल, अक्युरिक नेल)</p>			<p>५.१.२ फेसियलका लागि आवश्यक सामग्रीहरू : किट, हेयर ब्याड, बाटा, पफ, टोनिक, रोज वाटर, ब्याक हेड पिन, रिफ्रेसर स्प्रे, विद्युतीय मेसिनहरू आदि</p> <p>५.१.३ छालाको प्रकार : नर्मल, सुक्खा, तैलीय, मिश्रित र संवेदनशील फेसियलको प्रक्रिया-क्लिनिक, स्क्रब, मसाज, प्याक, क्रिम</p> <p>५.२ अनुहारको छालाको समस्या र समाधान</p> <p>५.३ अनुहारको छालाको समस्याहरू : ब्याक हेड, हवाइट हेड, डार्क सर्कल, पिम्पल, एक्ने, हाइपर पिगमेन्टेसन, डिहाइड्रेसन, प्रिम्याचुअर्ड स्किन</p> <p>५.४ छालाको समस्याको समाधान</p> <ul style="list-style-type: none"> - छालाको प्रकृतिअनुसारको उपचार - घरेलु उपचार 	
६. केशको स्याहार र शृङ्गार	<p>६.१ केश स्याहारको परिचय र महत्त्व</p> <p>६.१.१ केशको रचना (Anatomy)</p> <p>६.१.२ केशका कार्यहरू</p> <p>६.१.३ केशका प्रकारहरू : सुक्खा, तैलीय, सामान्य र मिश्रित</p> <p>६.२ केशको स्याहारका लागि आवश्यक सामग्रीहरू : स्याम्पु, कन्डिसनर, क्रिम, ब्लोडाइ ट्रिटमेन्ट,</p> <p>६.३ केश स्याहारका घरेलु</p>	१५	६. अनुहारको शृङ्गार	<p>६.१ अनुहारको शृङ्गार</p> <p>६.१.१ परिचय र महत्त्व</p> <p>६.१.२ ग्राहकलाई शृङ्गारका लागि तयारी</p> <p>६.१.३ छालाको समस्या पत्ता लगाउने तरिका</p> <p>६.१.४ अनुहारको वर्णअनुसारको शृङ्गार</p> <p>६.१.५ शृङ्गारका लागि उपयुक्त उत्पादनको छनोट तथा प्रयोग</p> <p>६.१.६ आधारभूत शृङ्गारको प्रक्रिया</p>	१५

	<p>उपायहरू</p> <p>६.४ केशका समस्याहरू : कपाल भर्ने, हागा आउने वा टुक्रिने, तेल आउने, सुक्खा हुने, उमेर नपुरदै कपाल सेतो हुने</p> <p>६.५ केशका समस्याको समाधान</p> <p>६.६ स्याम्पु, कन्डिसनर र ब्लोड्राइको उपयोगिता र उचित प्रयोग</p> <p>६.७ केशको स्याहारका तरिकाहरू : कपाल राम्रोसँग धुने, तेल लगाउने, पाँच हप्तामा कपाल ट्रिम गर्ने, सही स्याम्पुको प्रयोग गर्ने</p> <p>६.८ केशको शृङ्गार</p> <p>६.८.१ परिचय आवश्यकता, महत्त्व,</p> <p>६.८.२ केश शृङ्गारका लागि आवश्यक सामग्रीहरू : स्टोन पिन, लावर पिन, ग्लिटर पिन, फाइन पिन, बब (bob) पिन, यु पिन, रबर ब्यान्ड, काँड्यो ब्याक कोम, टेलकोम, बिग कोम, हेयर स्प्रे, हेयर जेल, जुरो नेट, ड्रायर आदि</p> <p>६.८.३ रोलरद्वारा कपाल सेट</p> <p>६.८.४ कपाल बाट्ने तरिका : एकल चुल्ठो, माछी काँडा, साइड बेन्ड</p> <p>६.८.५ जुरोका प्रकार : फ्रेन्च नटजुरो, लोबन जुरो, मेस्सी जुरो</p> <p>६.८.६ स्विच फिक्सिड : नक्कली जुरो लगाउने तरिका</p> <p>६.८.७ बिग फिक्सिड : नक्कली कपाल लगाउने तरिका</p>		<p>६.९.७ शृङ्गारका प्रकारहरू</p> <p>(क) दैनिक शृङ्गार</p> <p>(ख) पार्टी शृङ्गार</p> <p>(ग) नमुना शृङ्गार</p> <p>(ग) मन्च शृङ्गार</p> <p>(घ) क्यामरा/मिडिया शृङ्गार</p> <p>(ङ) बेहुली शृङ्गार</p> <p>(च) स्थानीय संस्कृति र प्रचलन अनुसारको अनुहारको शृङ्गार</p>	
--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

<p>७. छालाको स्याहार</p>	<p>७.१ छालाको परिचय ७.१.१ बनावट र कार्य ७.१.२ छालाको प्रकार : सुक्खा, तैलीय, साधारण र मिश्रित छाला ७.२ छालाको स्याहार गर्ने विधिहरू ७.२.१ क्लिन्जिङ, टोनिङ, मोइस्चराइजिङ, प्रोटेक्सन ७.२.२ घरेलु र प्राकृतिक उपायद्वारा छालाको स्याहार ७.३ क्लिन्जिङ ७.३.१ परिचय ७.३.२ आवश्यकता र महत्त्व ७.३.३ क्लिन्जिङका लागि आवश्यक सामग्रीहरू ७.३.४ क्लिन्जिङका प्रकारहरू ७.३.५ क्लिन्जिङ गर्ने तरिका र सावधानी (क) स्किन टेस्ट (ख) प्याच टेस्ट (patch test) ७.३.६ ब्लिच (Bleach) ७.३.७ छालाको प्रकृतिअनुसारको क्रिमको प्रयोग</p>	<p>१०</p>	<p>७. स्या र मसाज थेरापी</p>	<p>७.१ स्याको परिचय, विगत र वर्तमान अवस्था ७.२ नेपालमा स्याको प्रचलन ७.३ स्याद्वारा उपचार ७.४ मसाजको विकास ७.५ मसाजको प्रकारहरू (चियर मसाज, आयुर्वेदिक मसाज, ब्याक नेक र सोल्डर मसाज)</p>	<p>५</p>
<p>द. अनुहारको शृङ्गार</p>	<p>द.१ अनुहारको शृङ्गार द.१.१ परिचय र महत्त्व द.१.२ छालाको वर्ण (कालो, गोरो, गहुँगोरो) द.१.३ प्राकृतिक अनुहारलाई आकर्षित बनाउने तरिका द.१.४ अनुहारको आकार द.१.५ छालाको प्रकृतिअनुसार सौन्दर्य प्रसाधनको प्रयोग</p>	<p>१५</p>	<p>द. मेहन्दी</p>	<p>द.१ मेहन्दीको परिचय, महत्त्व र उपयोगिता द.२ मेहन्दीका सामग्रीहरू द.३ मेहन्दी बनाउने तरिका द.४ मेहन्दीको प्रयोग : ट्रिटमेन्टका रूपमा, आर्टको रूपमा द.५ मेहन्दी प्रयोगका प्रकारहरू : ब्राइडल, अकेजनल</p>	<p>६</p>

९. स्या	९.१ स्या ९.१.१ स्याको परिचय, महत्त्व र उपयोगिता ९.१.२ स्याको अवधारणा र विकासक्रम ९.१.३ स्याका लागि आवश्यक साधन तथा आपूर्ति	४	९. कपालमा रसायन र रङको प्रयोग	९.१ परिचय ९.२ कपालमा रङ र रसायनको प्रयोग गर्नुपर्ने कारणहरू ९.३ कपालमा रङ र रसायनको प्रयोग गर्ने विभिन्न तरिकाहरू : कपाल कलर र हाइलाइट, पर्म र स्ट्रेट ९.४ कपालमा रसायन र रङको प्रयोग गर्दा अपनाउनुपर्ने सावधानीहरू	६
जम्मा		८०	जम्मा		८०
प्रयोगात्मक क्रियाकलाप र परीक्षा		८०	प्रयोगात्मक क्रियाकलाप र परीक्षा		८०
कुल जम्मा		१६०	कुल जम्मा		१६०

प्रयोगात्मक तथा परियोजना कार्य

यस विषयमा प्रयोगात्मक कार्य अन्तरगत तलको तालिकामा दिइएका क्रियाकलापहरू गराउनु पर्नेछ । यसमा सम्बन्धित क्रियाकलापको स्थानीय संस्कृति र परम्परा अनुसारका क्रियाकलापहरू समेतको पहिचान गरी तिनको समेत अभ्यास गराउनु पर्नेछ ।

कक्षा ११

एकाइ क्षेत्र	प्रयोगात्मक क्रियाकलाप	कार्य घण्टा
१. पोषण, सन्तुलित भोजन र व्यायाम	१. शारीरिक सुन्दरताका लागि सन्तुलित भोजन तालिका (Diet Plan) निर्माण : किशोरकिशोरी, गर्भवती महिला तथा प्रौढ व्यक्तिका लागि छुट्टाछुट्टै आवश्यक तत्वहरूको मात्रासहित भोजन तालिका बनाउने र प्रदर्शन एवम् प्रस्तुतीकरण	६
२. प्राथमिक उपचार, सरसफाइ, र निर्मलीकरण	१. स्थानीय तहमा सञ्चालित सौन्दर्य गृहमा गई सौन्दर्य प्रशाधकले प्रयोग गर्ने प्राथमिक उपचार किट बक्स (First Aid Kit Box) तयारी, निर्मलीकरणका विधिहरूको प्रयोगको तरिकाको टिपोट तथा समीक्षा गरी उपयुक्त नमुना प्रदर्शन	५
३. शरीरका अनावश्यक रौं हटाउने तरिका	१. श्रेडिङ, हट वाक्स तथा कोल्ड वाक्स, अनुहारको बनोटअनुसार आँधीभौंको आकारप्रकार निर्माण, रेजर, हेअर रिमुभिड क्रिम र साबुनको प्रयोग जस्ता विषयक्षेत्रमा केन्द्रित भई सहपाठी साथीको शृङ्गार र एकआपसको कार्यको लेखाजोखा	१०
४. हातखुट्टाको शृङ्गार	१. मेनिक्चोर तथा पेडिक्योरको नमुना प्रदर्शन	१४
५. केशको स्याहार र	१. केश शृङ्गारका विभिन्न नमुना सङ्कलन तथा अध्ययन गरी कपालको	१६

शुङ्गार	प्रकृतिअनुसार तेल मसाजका तरिका, विभिन्न प्रकारका चुल्ठो र कपालको डिजाइन, नक्कली कपाल लगाउने तरिका, रोलर सेटिङ, फ्रेन्चनट जुरो, लोबन जुरो र मेस्सी जुरो बनाउने तरिका समेटी प्रतिवेदन तयारी र प्रस्तुतीकरण	
६. छालाको स्याहार	१. छालाको वर्ण र प्रकारअनुसारका क्लिन्जिङको नमुना प्रदर्शन	१०
७. अनुहारको शुङ्गार	१. अनुहारको आकारअनुसारको शुङ्गार गर्ने भिन्न भिन्न तरिका सङ्कलन गरी कक्षामा प्रस्तुति	१४
८. स्या	१. स्याका लागि आवश्यक सामग्री सङ्कलन प्रयोग गरी नमुना प्रदर्शन गर्ने लघुपरियोजना कार्य	५
		जम्मा ८०

कक्षा १२

विषय क्षेत्र	प्रयोगात्मक क्रियाकलाप	कार्य घण्टा
१. सौन्दर्य तथा र केशकलाको परिचय	१. सौन्दर्य सम्बन्धी परम्परागत ज्ञान र प्रयोग सम्बन्धी समुदायका व्यक्तिहरूसँग प्रश्न गरी सूचना सङ्कलन र त्यसका आधारमा प्रतिवेदन तयारी र प्रस्तुतीकरण	६
२. शरीरका अनावश्यक रौं हटाउने तरिका	१. डेपिलेसन, एपिलेसन, थ्रेडिङ र अनुहारको संरचनाअनुसारको आँखीभौंको आकृति निर्माण विधि तरिका उपयोग गरी नमुना प्रदर्शन	१२
३. हातखुट्टाको शुङ्गार	१. मेनिक्चोर, पेडिक्योर तथा नेलआर्टको नमुना प्रदर्शन	१०
४. केश काट्ने र केशको शुङ्गार	१. सामाजिक तथा साँस्कृतिक कार्य (बिहे, भोज, व्रतबन्धलगायत) को अवलोकन भ्रमण गरी उपस्थित व्यक्तिले गरेका केश शुङ्गारका नमुना सङ्कलन, तिनको विश्लेषण वा समीक्षा र तिनका सुधारका नमुना कक्षामा प्रदर्शन	१४
५. फेसियल	१. स्थानीय व्यक्तिसँग फेसियलका स्थानीय र घरेलु तरिकाका बारेमा टिपोट गरी तिनका नमुना कक्षामा प्रदर्शन	८
६. अनुहारको शुङ्गार	१. विभिन्न उत्सव, कार्यक्रम र अवसर अनुसार गरिने पार्टी, मोडल, स्टेज, बेहुली, क्यामरा र मिडिया शुङ्गारको अभ्यासमेत समेटी स्थानीय संस्कृति र चालचलन अनुसारका शुङ्गारका तारिकाको तुलनात्मक विश्लेषण तयारी र प्रस्तुति	१२
७. स्या र मसाज थेरापी	१. स्थानीय समुदायमा विभिन्न संस्कृति र चालचलन अनुसार मसाजको प्रयोग कसका लागि, किन र कसरी गर्ने गरिएको पाइन्छ भनी समुदायका मानिसहरूसँग सोधेर प्रतिवेदन तयार गरी प्रस्तुति र छलफल	६
८. मेहन्दी	१. मेहन्दीका विभिन्न डिजाइनका नमुना सङ्कलन तथा मेहन्दी लगाउने अभ्यास	६

९. कपालमा रसायन र रङको प्रयोग	१. कपालमा रसायनको प्रयोग गर्ने विधिको नमुना प्रदर्शन	६
	जम्मा	८०

५. सिकाइ सहजीकरण प्रक्रिया

सौन्दर्यकला र केशकला विषयको आफ्नै मौलिक तथा विशिष्ट सिकाइ सहजीकरण प्रक्रिया रहेको छ । विशेषतः गरेर सिकको सिद्धान्तअनुसार यस विषयका हरेक क्रियाकलाप प्रयोगात्मक अभ्यासमा नै केन्द्रित रहन्छन् । यस सम्बन्धी गतिविधिहरू सौन्दर्य कलाको मेरुदण्डका रूपमा रहेका छन् । यसर्थ यस विषयको सिकाइ सहजीकरण कार्यलाई प्रभावकारी बनाउन विषयवस्तुको प्रकृतिअनुसार निम्नानुसारका शिक्षण विधि प्रयोगमा ल्याउन सकिन्छ :

- (क) छलफल विधि (ख) प्रश्नोत्तर विधि (ग)सामग्री प्रदर्शन विधि (घ) प्रक्रिया प्रदर्शन विधि
 (ङ) प्रयोगात्मक विधि (च)सर्वेक्षण विधि (छ) परियोजना विधि (ज) जोडा अवलोकन विधि
 (झ) स्थलगत अध्ययन विधि

उल्लिखित शिक्षण विधि प्रयोग गरी सिकाइ सहजीकरण प्रक्रिया सञ्चालन गर्दा शिक्षकले केही महत्त्वपूर्ण पक्षमा ध्यान दिनुपर्छ । शिक्षकले वार्षिक शिक्षण योजना, एकाइ योजना र दैनिक पाठ्ययोजना निर्माण गरी सोअनुसार सिकाइ सहजीकरण प्रक्रिया सञ्चालन गर्नुपर्छ । सौन्दर्यकला र केशकला विषयको सहजीकरण क्रियाकलापहरू सञ्चालन गर्दा विद्यार्थीको पूर्वज्ञान र अवधारणा एवम् पूर्वअनुभवमा ध्यान दिनुपर्दछ । यो प्रयोगात्मक विषय भएकाले प्रदर्शन, अवलोकन र प्रयोग विधिको प्रयोग गर्न विशेष जोड दिनुपर्दछ । सैद्धान्तिक विषयवस्तुको प्रस्तुतिपछि विद्यार्थीहरूलाई यथासम्भव अवलोकन, प्रयोगात्मक कार्य, आफूले गरेका कार्यको प्रदर्शन र प्रस्तुति गर्न लगाउनुपर्दछ । विद्यार्थीलाई विभिन्न सौन्दर्य प्रशासन केन्द्र र स्यालोनहरूको अवलोकन र अध्ययन भ्रमणमा सहभागी गराउनुपर्दछ । सौन्दर्यविद् र अनुभवी प्रशिक्षकहरूबाट अतिथि कक्षा लिन लगाउने, प्रवचन, परामर्श तथा पथप्रदर्शन कक्षाहरू सञ्चालन गर्ने व्यवस्था मिलाउनुपर्दछ । प्रयोगात्मक विषय भएकाले यो विषय केही खर्चिलो हुने कुरालाई दृष्टिगत गरी सिकाइ सहजीकरणका क्रममा विद्यालयमा उपलब्ध हुन नसक्ने सामग्री र तिनीहरूको प्रयोगका सम्बन्धमा सामुदायिक स्रोत परिचालन र अभिभावकसँग सम्पर्क गरी जानकारी गराउनु पनि उत्तिकै आवश्यक छ । सिकाइ सहजीकरण प्रक्रियामा विद्यार्थीमा सैद्धान्तिक ज्ञान, क्रियात्मक सोचाइ तथा प्रयोगात्मक सिप र सिकाइमा निरन्तर रूपमा लागि पर्ने बानी र अभिवृत्तिको विकास गर्नमा जोड दिनुपर्छ । सिकाइलाई बोधमा मात्र सीमित नराखी पूर्णता प्रदान गर्नका लागि पर्याप्त अवसर दिई सिर्जनात्मक प्रयोगका लागि स्थानान्तरण गर्न सक्ने अवस्थामा पुऱ्याउनुपर्छ ।

विद्यार्थीहरूले विभिन्न सञ्चारका साधनहरू, पुस्तक, पत्रपत्रिका र जर्नलहरू, इन्टरनेटलागायतका माध्यमहरूबाट धेरै विषयको जानकारी हासिल गर्न सक्छन् । नयाँ नयाँ ज्ञान र सिप हासिल गर्न सक्छन् । आफ्नो सिकाइलाई अद्यावधिक राख्न सक्छन् । उनीहरूलाई विभिन्न स्रोतहरूबाट सौन्दर्य कला, शरीरका विभिन्न अङ्गहरूको शृङ्गार, शरीरलाई सुन्दर राख्ने विभिन्न तरिका र उपायहरूसम्बन्धी जानकारीहरू, चित्र आदिको कटआउटसको फाइल तयार गर्ने, यस सम्बन्धी सामग्री र टिप्स तयार गर्न गरी बुलेटिन बोर्डमा टाँस्ने, कक्षामा छलफल गर्ने जस्ता क्रियाकलापहरूमा संलग्न गराउनुपर्दछ ।

कुनै पनि शिक्षण विधि प्रयोग गर्दा शिक्षकले विद्यार्थीको बुझ्ने क्षमता र परिपक्वतामा ध्यान दिनुपर्दछ । सम्बन्धित विषय र विषयवस्तुका बारेमा विद्यार्थीमा अभिरुचि जागरण गर्नुपर्दछ । सौन्दर्य तथा केशकला शिक्षा प्रयोगात्मक विषय भएकाले विद्यार्थीलाई पहिले सम्बन्धित विषयवस्तुको जानकारी दिने, सौन्दर्य प्रशासनका विभिन्न विधि, प्रविधि र प्रक्रियाका बारेमा छलफल गर्ने, प्रयोग गरिने सामग्रीहरूको सूची प्रस्तुत गर्ने, प्रदर्शन गर्ने र प्रशस्त अभ्यास गर्ने अवसर दिनुपर्दछ । विद्यार्थीमा सिर्जनशील रूपमा विचार गर्ने, नयाँ नयाँ तरिका र शैलीको परीक्षण र प्रयोग गर्न सहयोग गर्ने गर्नुपर्दछ । उनीहरूलाई आवश्यकताअनुसार दुई जनाको समूह, सानो समूह र ठुलो समूहमा काम गर्न लगाई समूहमा काम गर्ने, एकअर्काबाट सिक्ने, एकअर्कालाई सिकाइमा सहयोग गर्न प्रोत्साहन गर्नुपर्दछ ।

६. विद्यार्थी मूल्याङ्कन

पाठ्यक्रमले निर्धारण गरेका उद्देश्यअनुरूप विद्यार्थीहरूले ज्ञान, सिप तथा अभिवृत्तिको विकास गर्न सके सकेनन् र उनीहरूमा अपेक्षित मूल्यमान्यताको विकास र व्यावहारिक परिवर्तन भयो भएन भनी लेखाजोखा गर्ने पद्धति नै मूल्याङ्कन हो । सौन्दर्य तथा केशकला शिक्षा विषयमा तहगत सक्षमता र कक्षागत सिकाइ उपलब्धिहरूअनुरूप सिकाइको सबै स्तरलाई समेटेर विद्यार्थीहरूको मूल्याङ्कन गरिने छ । कुल कार्यघण्टामध्ये ५० प्रतिशत अर्थात् ८० कार्यघण्टामा पठनपाठन गरिएका सैद्धान्तिक विषयवस्तुमा आधारित भई बाह्य परीक्षा सञ्चालन हुने छ । यसै गरी आन्तरिक र प्रयोगात्मक कार्यकलापका लागि छुट्टयाइएको ८० कार्यघण्टामा गरिएका क्रियाकलापहरूबाट विद्यार्थीले हासिल गरेका सक्षमता र सिकाइ उपलब्धिहरूको मूल्याङ्कनका लागि आन्तरिक मूल्याङ्कनका विभिन्न विधिहरूको प्रयोग गरिने छ । आन्तरिक र बाह्य मूल्याङ्कनको निर्धारित बेग्लाबेग्लै स्तरीकरण गरिने छ । अन्त्यमा आन्तरिक मूल्याङ्कन र बाह्य परीक्षामा प्राप्त गरेको नतीजालाई आधारमानी अक्षराङ्कन पद्धतिअनुसार स्तर निर्धारण गरिने छ ।

(क) आन्तरिक मूल्याङ्कन

आन्तरिक मूल्याङ्कनका लागि प्रत्येक विद्यार्थीको कार्यसञ्चयिका फाइल (Portfolio) तयार गरेर विभिन्न प्रयोगात्मक कार्यहरूको शिक्षकले अवलोकन गरी तयार गरेका रुजूसूची, श्रेणीमापन, रब्रिक्स आदि अवलोकन फारामहरू, उनीहरूले तयार गरेका फाइलमा राख्न मिल्ने सम्मका सामग्रीहरू, विद्यार्थीद्वारा लिखित सामग्रीहरू, विद्यार्थीले तयार गरेका चित्र, कटाउटस, नमुना, गृहकार्य, कक्षाकार्य, परियोजना कार्य, सामुदायिक कार्य, सह/अतिरिक्त क्रियाकलाप र प्रयोगशालाका कार्यहरूको अभिलेख, आवधिक रूपमा लिइएका एकाइ वा त्रैमासिक परीक्षाहरूको नतीजा आदिको अभिलेख राखिने छ र सोका आधारमा अङ्क प्रदान गरिने छ । विद्यार्थीहरूले के कति सिके भन्ने कुरा पत्ता लगाई नसिकेको भए कारण पहिचान गरी सुधारात्मक र उपचारात्मक शिक्षण पद्धतिअनुसार पुनः सिकाइने छ । विशेष सिकाइ आवश्यकता भएका विद्यार्थीका लागि विषय शिक्षकले नै उपयुक्त प्रक्रिया अपनाई मूल्याङ्कन गर्नुपर्ने छ । शिक्षकले यस प्रकारको मूल्याङ्कन निरन्तर रूपमा गरी विद्यार्थीहरूमा अपेक्षित सिप र व्यवहार विकासमा जोड दिनुपर्ने छ ।

यस विषयमा कक्षा ११ र १२ मा कुल भारमध्ये ५० प्रतिशत भार आन्तरिक मूल्याङ्कनमार्फत हुने छ । यसको मूल्याङ्कन निम्नअनुसार हुने छ :

कक्षा ११ र १२ मा आन्तरिक मूल्याङ्कन

क्र.सं.	आन्तरिक र प्रयोगात्मक कार्य	अङ्कभार
१	कक्षा सहभागिता	३
२	प्रयोगात्मक तथा परियोजना कार्य	१६
३	त्रैमासिक परीक्षाको अङ्क	६
४	बाह्य विज्ञद्वारा स्थलगत प्रयोगात्मक कार्य र अन्तर्वाता	२५
		जम्मा
		५०

(ख) बाह्य मूल्याङ्कन

यस विषयमा कक्षा ११ र १२ प्रत्येकमा कुल भारमध्ये ५० प्रतिशत भार बाह्य मूल्याङ्कनमार्फत हुनेछ । कक्षा ११ र १२ प्रत्येक कक्षामा लागि लिइने परीक्षाका लागि पाठ्यक्रम विकास केन्द्रले तयार गरेको विशिष्टीकरण तालिकाअनुसार प्रश्नपत्र निर्माण गर्नुपर्ने छ । यस विषयको परीक्षामा विशेष गरेर ज्ञान/बोध, समस्या समाधान, समालोचनात्मक, सिर्जनासँग सम्बन्धित प्रश्नहरू सोधिने छन् । पाठ्यक्रमले निर्धारण गरेका उद्देश्यअनुरूप विद्यार्थीहरूले ज्ञान, सिप र अभिवृत्ति प्राप्त गरे नगरेको मूल्याङ्कन गरिने छ ।

जडीबुटी

कक्षा : ११ र १२

विषय सङ्केत : Hrb. 433 (कक्षा ११)

Hrb.434 (कक्षा १२)

पाठ्यघण्टा : ५

कार्यघण्टा : १६०

१. परिचय

नेपाल जडीबुटीको भण्डार हो । यहाँ सात हजार किसिमका फूल फुल्ने वनस्पति पाइन्छन् । तीमध्ये यहाँ सात सय प्रजातिका जडीबुटी औषधीका रूपमा प्रयोग हुँदै आएका छन् । यसर्थ जडीबुटीको पहिचान, संरक्षण, उत्पादन तथा भण्डारण, औषधीका रूपमा उपयोगलगायतका सम्बन्धित पक्षसँग परिचित गराउने उद्देश्यका साथ कक्षा ११ र १२ को जडीबुटी विषयको पाठ्यक्रम विकास गरिएको हो । राष्ट्रिय पाठ्यक्रम प्रारूप, २०७६ को मार्गदर्शनबमोजिम विद्यालय शिक्षाको माध्यमिक तह (कक्षा ११ र १२) मा जडीबुटी विषयको यस पाठ्यक्रममा धेरै मात्रामा जडीबुटीको सम्भावना, उत्पादन, उत्पादित सामग्रीको व्यवस्थापन, प्रचारप्रसार र बजारसम्बद्ध विषयवस्तुहरूलाई समावेश गरिएको छ । यस पाठ्यक्रमको अध्ययनपश्चात् जडीबुटीको पहिचान, संरक्षण, संवर्धन तथा विस्तारमा वैयक्तिक तथा सामूहिक सहयोगमा अग्रसरता देखाउने अपेक्षा राखिएको छ । यसका साथै यस पाठ्यक्रमले सम्बन्धित विषयमा उच्च शिक्षाको आधारसमेत तयार गर्ने अपेक्षा छ ।

जडीबुटी विषयको पाठ्यक्रममा विभिन्न जडीबुटीको परिचय, जडीबुटीको पहिचान र वर्गीकरण, जडीबुटी खेती, जडीबुटी सङ्कलन, भण्डारण, प्याकेजिङ र लेबलिङ, जडीबुटी प्रशोधन, प्रचलित जडीबुटीहरूको प्रयोग अङ्गको उपयोग र यसका फाइदाहरूलगायतका विषयवस्तुका सैद्धान्तिक तथा प्रयोगात्मक पक्षको सिकाइ गर्न विद्यार्थीकेन्द्रित सिकाइ सहजीकरण विधि तथा प्रक्रियामा जोड दिइएको छ । यसबाट विषयवस्तुमा आधारित भई प्रयोगात्मक अभ्यास, स्थलगत अध्ययन भ्रमण, खोजमूलक निरन्तर सिकाइ, सिकाइ र मूल्याङ्कन पद्धतिलाई प्रयोगात्मक र खोजमूलक बनाउन सहज हुने अपेक्षा गरिएको छ । यस पाठ्यक्रमले ज्ञान पक्षभन्दा पनि सिप तथा अभिवृत्तिमा जोड दिई विषयको अध्ययनलाई व्यावहारिक र प्रयोगात्मक बनाउने प्रयास गरेको छ । जडीबुटीको संरक्षण, उत्पादन तथा व्यवस्थापनमा आएको नयाँ नयाँ अवधारणा र विधि तथा पद्धतिलाई समेत ध्यान दिएर यो पाठ्यक्रम तयार गरिएको छ । यसर्थ जडीबुटी विषयको पाठ्यक्रम विकास गर्दा उल्लिखित विषयवस्तुको अवधारणा विकास, अभ्यास र निरन्तर सिकाइ तथा मूल्याङ्कनबिचको सन्तुलन कायम गरिएको छ ।

यस क्रममा पाठ्यक्रम विकासको विषयगत औचित्य, पाठ्यक्रममा रहेका मुख्य विशेषता तथा पाठ्यक्रमको स्वरूपलाई समेटेरी परिचय, विषयगत रूपमा अपेक्षित ज्ञान, सिप, अभिवृत्ति, मूल्य र कार्य तत्परतालाई समेटेरी त्यसको क्रियात्मक स्वरूपमा सक्षमता, सिकाइको स्तर र सक्षमताको विशिष्टीकृत विस्तृतीकरण गरी सिकाइ उपलब्धि, सक्षमता, सिकाइ उपलब्धि एवम् अधिल्ला कक्षासँग लम्बीय सन्तुलनका आधारमा विषयवस्तुको क्षेत्र र क्रम, विषयगत विशिष्टपन र मौलिकतालाई समेटेरी सिकाइ सहजीकरणका विधि तथा प्रक्रिया एवम् निर्माणात्मक र निर्णयात्मक मूल्याङ्कनका विधि तथा प्रक्रिया उल्लेख गरी विद्यार्थी मूल्याङ्कनलाई व्यवस्थित गरिएको छ ।

२. तहगत सक्षमता

माध्यमिक तह (कक्षा ११ र १२) को अध्ययनपश्चात् विद्यार्थीहरूमा जडीबुटी विषयका निम्नलिखित सक्षमता हासिल हुने छन् :

१. जडीबुटीको परिचय, प्रकार र महत्त्व बोध र प्रस्तुति
२. नेपालमा उपलब्ध जडीबुटी पहिचान गरी तिनको उत्पादन
३. नेपालमा जडीबुटी खेतीसम्बद्ध पक्षहरूको पहिचान, प्रस्तुति, समीक्षा र नमुना अभ्यास
४. जडीबुटी सङ्कलन, भण्डारण, प्याकेजिङ र लेबलिङको बोध र अभ्यास
५. जडीबुटी प्रशोधनका परम्परागत तथा आधुनिक अभ्यासको विश्लेषण

६. जडीबुटी खेतीबाट हुने फाइदा तथा बेफाइदाबिच तुलना र आयआर्जनमा प्रयोग
७. जडीबुटीको संरक्षण तरिकाको बोध र नमुना अभ्यास

३. कक्षागत सिकाइ उपलब्धि

माध्यमिक तह (कक्षा ११ र १२) को अध्ययनपश्चात् विद्यार्थीहरूमा जडीबुटी विषयका निम्नलिखित सिकाइ उपलब्धि हासिल हुने छन् :

एकाइ	विषयक्षेत्र	कक्षा ११	कक्षा १२
		सिकाइ उपलब्धि	सिकाइ उपलब्धि
१	जडीबुटीको परिचय	<p>१.१ पूर्वीय मान्यता, पाश्चात्य मान्यता, तथा नेपाली परिप्रेक्ष्यका आधारमा जडीबुटीको ऐतिहासिक पृष्ठभूमि बताउन</p> <p>१.२ जडीबुटीको परिचय दिई यसको परिभाषा र प्रकार प्रस्तुत गर्न</p> <p>१.३ जडीबुटीको महत्त्व बताउन</p> <p>१.४ औषधीयुक्त जडीबुटी, सुगन्धित तेलयुक्त जडीबुटी र अन्य गैरकाष्ठवन पैदावरका आधारमा जडीबुटीको प्रकार बताउन</p>	<p>१.१ आधुनिक रासायनिक सङ्गठनका बारेमा बताउन</p> <p>१.२ आयुर्वेदिक गुण र प्रयोगको सूची बनाउन</p> <p>१.३ घरेलु र सामुदायिक जडीबुटी खेती प्रविधि प्रस्तुत गर्न</p> <p>१.४ नेपालका व्यापारिक महत्त्वका जडीबुटीहरूको व्यावसायिक खेतीका विशेषता बताउन</p> <p>१.५ जडीबुटी बहुआयामिक प्रयोग सूची निर्माण गर्न</p>
२	जडीबुटीको पहिचान र वर्गीकरण	<p>२.१ उदाहरणसहित जडीबुटीको स्वरूप बताउन</p> <p>२.२ जडीबुटीको दिगो उपयोगको अर्थ र महत्त्व बताउन</p> <p>२.३ जडीबुटीको नामकरण एवम् त्यसका आधारहरू प्रस्तुत गर्न</p> <p>२.४ उदाहरणसहित जडीबुटीको वर्गीकरण गर्न</p> <p>२.५ जडीबुटीको वर्गीकरण एवम् त्यसका आधारहरू बताउन</p>	<p>२.१ निर्धारित जडीबुटीको पर्यायवाची नाम बोध गरी त्यसको महत्त्व बताउन</p> <p>२.२ स्थानीय स्तरमा उपलब्ध जडीबुटीको पहिचान गरी पर्याय तथा वैज्ञानिक नाम भन्न</p> <p>२.३ जडीबुटीको कुल, स्थूल एवम् सूक्ष्म स्वरूप बताउन</p> <p>२.४ निर्धारित जडीबुटीको प्रयोज्य अङ्ग पहिचान गरी एकल द्रव्य प्रयोग गर्न</p> <p>२.५ जडीबुटीको वर्गीकरण गरी तालिकामा प्रस्तुत गर्न</p> <p>२.६ चरकोक्त एवम् सुश्रुतोक्त गण वा वर्गहरूका बारेमा जानकारी हासिल गरी तिनको समता र भिन्नता प्रस्तुत गर्न</p>
३	जडीबुटी खेती	<p>३.१ जडीबुटी खेतीको आवश्यकता र</p>	<p>३.१ स्थायी र अस्थायी नर्सरीका भिन्नता</p>

		<p>फाइदाको सूची बनाउन</p> <p>३.२ नेपालमा जडीबुटीको फैलावटको अवस्था प्रस्तुत गर्न</p> <p>३.३ स्थानीय तहमा उपलब्ध जडीबुटीको उत्पादन गर्न</p> <p>३.४ जडीबुटी खेतीका लागि ध्यान पुऱ्याउनुपर्ने पक्षहरू बताउन</p> <p>३.५ जडीबुटी नर्सरीको परिचय दिँदै उपयुक्त स्थान छनोटका लागि ध्यान दिनुपर्ने पक्षहरू प्रस्तुत गर्न</p> <p>३.६ जडीबुटीको खेतीका अभ्यास बताउन</p> <p>३.७ नेपालीमा संरक्षित जडीबुटीको सूची बनाउन</p>	<p>प्रस्तुत गर्न</p> <p>३.२ नर्सरी निर्माण गर्दा आवश्यक पर्ने सामग्री तथा औजारहरू पहिचान, सङ्कलन र प्रयोग गर्न</p> <p>३.३ नर्सरीमा बिरुवाहरू उमार्ने तरिका छोटकरीमा वर्णन गर्न</p> <p>३.४ नमुना नर्सरी निर्माण गरी प्रदर्शन गर्न</p> <p>३.५ जडीबुटीको खेती प्रविधिका निर्धारित पक्षका आधारमा सूची निर्माण गरी तिनका बारेमा बताउन</p> <p>३.६ नेपालमा जडीबुटीको बजार प्रणालीको अवस्था पहिचान गरी उपयुक्त प्रणाली तथा सुधारयोग्य प्रणाली प्रस्तुत गर्न</p> <p>३.७ जडीबुटी खेती प्रविधिको वर्णन गर्न</p>
४	जडीबुटी सङ्कलन, भण्डारण, प्याकेजिङ र लेबलिङ	<p>४.१ जडीबुटीको दिगो सङ्कलन तथा व्यवस्थापन प्रक्रिया बोध गरी अवलम्बन गर्न</p> <p>४.२ जडीबुटीको सङ्कलन प्रविधि तथा दिगो सङ्कलन गर्दा ध्यान पुऱ्याउनुपर्ने आवश्यक पक्षहरू प्रस्तुत गर्न</p> <p>४.३ जडीबुटीको सङ्कलन योग्य अङ्ग, समय, ऋतु र तरिका प्रस्तुत गर्न</p> <p>४.४ नेपालका जडीबुटी सङ्कलन केन्द्रको स्थलगत अध्ययन भ्रमण गरी स्वानुभव बताउन</p> <p>४.५ जडीबुटीको दिगो सङ्कलन तथा व्यवस्थापनमा देखा परेका समस्याहरूको सूची तयार पारी समाधानका उपाय खोजी गर्न</p> <p>४.६ नेपालमा प्रचलित आयुर्वेदिक पद्धति अनुसार जडीबुटी सङ्कलनका विधिको नमुना अभ्यास गर्न</p> <p>४.७ जडीबुटीको आवश्यकता र फाइदा बताउन</p>	<p>४.१ जडीबुटीको भण्डारण गर्दा ध्यान पुऱ्याउनुपर्ने पक्षहरू बताउन</p> <p>४.२ सुगन्धित तेल वा सारको भण्डारण विधिको नमुना अभ्यास गर्न</p> <p>४.३ नेपालमा प्रचलित आयुर्वेदिक पद्धतिअनुसार जडीबुटी भण्डारणको प्रयोगात्मक अभ्यास गर्न</p> <p>४.४ अतिस, कूटकी, जटामांसी, लौठसल्ला, सतुवा, अमला, कुरिलो, मेन्था र अश्वगन्धाको सङ्कलन तथा भण्डारण अभ्यास</p> <p>४.५ जडीबुटी प्याकेजिङ गर्नुका कारण र यसका मुख्य विशेषता बताउन</p> <p>४.६ जडीबुटीको लेबलिङ गर्नुका कारण प्रस्तुत गर्दै लेबलिङका प्रकार बताउन</p> <p>४.७ जडीबुटी भण्डारणका आयुर्वेदिक तथा आधुनिक विधि बोध गरी तुलना गर्न</p>

५	जडीबुटी प्रशोधन	<p>५.१ जडीबुटी प्रशोधन परिचय बताउँदै यसको महत्त्व प्रस्तुत गर्न</p> <p>५.२ जडीबुटी प्रशोधनपछि मूल्य अभिवृद्धिका कारण प्रस्तुत गर्दै यसका फाइदाहरू बताउन</p> <p>५.३ जडीबुटी प्रशोधनका प्रारम्भिक चरणहरूको सूची तयारी पारी तिनको नमुना अभ्यास गर्न</p> <p>५.४ जडीबुटी प्रशोधनका परम्परागत तथा आधुनिक विधिका बारेमा जानकारी हासिल गरी प्रचलित विधिको प्रयोगात्मक अभ्यास गर्न</p> <p>५.५ सुगन्धित तेल प्रशोधन विधिहरूको बोध गरी तिनको उपयोग अभ्यास गर्न</p> <p>५.६ जडीबुटीको राष्ट्रिय बजार प्रणालीबारे बताउन</p>	<p>५.१ अर्क ९डिस्टिलेसन०, वाष्पीकरण ९स्टिम डिस्टिलेसन० तथा सुगन्धित तेलको शुद्धीकरणका बारेमा बताउन</p> <p>५.२ सुगन्धित तेलको भण्डारणका बारेमा जानकारी हासिल गरी नमुना अभ्यास गर्न</p> <p>५.३ प्रयोगशालामा सुगन्धित तेल उत्पादन गर्ने तरिका प्रस्तुत गर्न</p> <p>५.४ औद्योगिक स्तरमा सुगन्धित तेल उत्पादन गर्ने तरिका बोध गरी बताउन</p> <p>५.५ सारतत्त्वको परिभाषा बताउँदै सारतत्त्व बनाउने विधिहरू प्रस्तुत गर्न</p> <p>५.६ सारतत्त्व निकाल्न प्रयोग गर्ने घोलकहरूको सूची तयार पारी तिनको प्रयोगसम्बद्ध नमुना अभ्यास गर्न</p> <p>५.७ जडीबुटीको अन्तर्राष्ट्रिय बजार प्रणालीबारे बताउन</p>
६	जडीबुटीको उपयोग र प्रयोग	<p>६.१ जडीबुटीको आयुर्वेदमा प्रयोगका तरिका प्रस्तुत गर्न</p> <p>६.२ योग र प्राकृतिक चिकित्सामा जडीबुटीको प्रयोग तरिका बताउन</p> <p>६.३ जडीबुटीको सोवा रिरूपमा प्रयोग नमुना अभ्यास बताउन</p> <p>६.४ जडीबुटीको होमियोपेथीमा प्रयोगसम्बद्ध पक्षको बोध गरी सूची बनाउन</p>	<p>६.१ जडीबुटीको परम्परागत चिनियाँ चिकित्सामा प्रयोगबारे बताउन</p> <p>६.२ जडीबुटीको आधुनिक चिकित्सामा प्रयोगका क्षेत्र पहिचान गरी प्रस्तुत गर्न</p> <p>६.३ जडीबुटीको सौन्दर्य चिकित्सा र जैविक कृषिमा प्रयोगका बारेमा बताउन</p> <p>६.४ जडीबुटीको स्पा र एरोमा थेरापीमा प्रयोगको क्षेत्र पहिचान गरी प्रस्तुत गर्न</p> <p>६.५ खाद्यपोषणका रूपमा जडीबुटीलाई उपयोग गर्न</p>
७	जडीबुटीको संरक्षण	<p>७.१ जडीबुटी संरक्षणका लागि स्थानीय सिपको उपयोग</p> <p>७.२ कुटकी, जटामांसी, लोठसल्ला, अशोक र रुद्राक्ष जस्ता लोपोन्मुख जडीबुटीको संरक्षणमा सहयोग गर्न</p>	<p>७.१ जडीबुटी संरक्षणका लागि परम्परागत सिपको उपयोग</p> <p>७.२ जडीबुटीसँग सम्बन्धित ऐन, नियम र सम्बन्धित निकायको भूमिका बताउन</p> <p>७.३ नेपाली जडीबुटी र सोसँग सम्बन्धित</p>

		<p>७.३ स्थानीय स्तरमा पाइने जडीबुटीको नर्सरी व्यवस्थापन गर्न</p> <p>७.४ स्थानीय स्तरमा पाइने जडीबुटीको व्यावसायिक खेतीमा सहयोग गर्न</p> <p>७.५ जडीबुटीको बजार व्यवस्थापनमा देखापरेका समस्या र चुनौतीहरू प्रस्तुत गर्न</p>	<p>उद्योगहरूको वर्तमान अवस्था विश्लेषण गर्न</p> <p>७.४ नेपालको आर्थिक विकास र अनुसन्धानका लागि प्राथमिकता प्राप्त जडीबुटीहरूको विवरण प्रस्तुत गर्न</p> <p>७.५ नेपालमा जडीबुटी आयात तथा निर्यातको विवरण सङ्कलन गर्न</p> <p>७.६ नेपाल सरकारले संरक्षण गरेका जडीबुटीहरूका बारेमा बताउन</p>
--	--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

४. विषयवस्तुको क्षेत्र तथा क्रम

एकाइ	विषयक्षेत्र	कक्षा ११	कक्षा १२	कार्य घण्टा
		विषयवस्तु	विषयवस्तु	
१	जडीबुटीको परिचय	<p>१.१ जडीबुटीको ऐतिहासिक पृष्ठभूमि : पाश्चात्य मान्यता, पूर्वीय मान्यता, नेपाली परिप्रेक्ष्य</p> <p>१.२ जडीबुटीको परिचय (वानस्पतिक नाम, परिवार, नाम : नेपाली, अङ्ग्रेजी र स्थानीय, वानस्पतिक परिचय) पाइने स्थान र प्रकार</p> <p>१.३ जडीबुटीको महत्त्व</p> <p>१.४ जडीबुटीको प्रकार : औषधीयुक्त जडीबुटी, सुगन्धित तेलयुक्त जडीबुटी र अन्य गैरकाष्ठवन पैदावर</p>	<p>१.१ आधुनिक रासायनिक सङ्गठन</p> <p>१.२ आयुर्वेदिक गुण र प्रयोग : रस, गुण, वीर्य, विपाक, दोषकर्म, प्रभाव, प्रतिनिधि र मारग</p> <p>१.३ घरेलु र सामुदायिक जडीबुटी खेती प्रविधि तथा घरेलुकरण (Demestication)</p> <p>१.४ नेपालका व्यापारिक महत्त्वका जडीबुटीहरूको व्यावसायिक खेती</p> <p>१.५ जडीबुटी बहुआयामिक प्रयोग : औषधी (प्राणी र कृषि), सौन्दर्य प्रशाधन, खाद्यपोषण र रङ्गरोगन</p>	१०
२	जडीबुटीको पहिचान र वर्गीकरण	<p>२.१ जडीबुटीको स्वरूप :</p> <p>२.१.१ रूख : अमला, हर्रो, बर्रो, निम</p> <p>२.१.२ झाडी : टिमुर, सर्पगन्धा, तितेपाती, असुरो</p> <p>२.१.३ लहरा : गुर्जो, पिपला, चाबो</p> <p>२.१.४ फार : भृङ्गराज, लज्जावती जटामसी, कुटकी, तुलसी, ब्राह्मी</p> <p>२.१.५ हुसी वर्ग : यासागुम्बा, गुच्छी च्याउ, रातो च्याउ</p>	<p>२.१ जडीबुटीको पर्यायवाची नाम र त्यसको महत्त्व</p> <p>२.२ स्थानीय स्तरमा उपलब्ध जडीबुटी र तिनको पर्याय तथा वैज्ञानिक नाम</p> <p>२.३ जडीबुटीको कुल, स्थूल एवम् सूक्ष्म स्वरूप</p> <p>२.४ निर्धारित जडीबुटीको प्रयोज्य अङ्ग र एकल द्रव्य प्रयोग जडीबुटी : हर्रो, बर्रो, अमला,</p>	१०

		<p>२.२ जडीबुटीको दिगो उपयोग</p> <p>२.३ जडीबुटीको नामकरण एवम् त्यसका आधारहरू</p> <p>२.४ जडीबुटीको वर्गीकरण : एक वर्षीय, दुई वर्षीय र बहुवर्षीय</p> <p>२.५ जडीबुटीको वर्गीकरण एवम् त्यसका आधारहरू</p> <p>२.५.१ औषधीयुक्त जडीबुटी</p> <p>२.५.२ सुगन्धित तेलयुक्त जडीबुटी</p> <p>२.५.३ रेजिन र रड्युक्त वनस्पति</p>	<p>शुण्ठी, मरिच, पिप्ला, हरिद्रा, सतुवा, पाँचजौले, जटामांसी, धसिङ्गारे, काउलो, भुस्तृण,अश्वगन्धा, कुरिलो, निम, कुटकी</p> <p>२.५ जडीबुटीको वर्गीकरण</p> <p>कुल, मिश्रक वर्ग (त्रिफला, त्रिकटु, पञ्चपल्लव, पञ्चवल्कल, दशमुल)</p> <p>२.६ चरकोक्त एवम् सुश्रुतोक्त गण वा वर्ग</p>	
३	जडीबुटी खेती	<p>३.१ जडीबुटी खेतीको आवश्यकता र फाइदा</p> <p>३.२ नेपालमा जडीबुटीको फैलावट</p> <p>३.३ जडीबुटीको उत्पादन</p> <p>३.४ जडीबुटी खेतीका लागि ध्यान पुऱ्याउनुपर्ने पक्षहरू : क्षेत्र छनोट, हावापानी, माटो, मल /जैविक मल, जग्गा तयारी, उपयुक्त बिउ बिजनको तयारी, नर्सरी विधि, बिरुवा छनोट, बिरुवा रोपण, सिँचाइ, स्याहार सम्भार, बाली सङ्कलन, प्रशोधन, ग्रेडिङ, प्याकेजिङ, लेबलिङ, भण्डारण र बजारीकरण</p> <p>३.५ जडीबुटीको नर्सरी : परिचय, जडीबुटी नर्सरीको लागि स्थान छनोटका लागि ध्यान दिनुपर्ने पक्षहरू</p> <p>३.६ जडीबुटीको खेती (परम्परागत, जैविक)</p> <p>३.७ नेपालीमा संरक्षित जडीबुटी</p>	<p>३.१ नर्सरीको किसिम : स्थायी र अस्थायी</p> <p>३.२ नर्सरी निर्माण गर्दा आवश्यक पर्ने सामग्री तथा औजारहरू</p> <p>३.३ नर्सरीमा बिरुवाहरू उमाने तरिका</p> <p>३.४ नमुना नर्सरी</p> <p>३.५ जडीबुटीको खेती प्रविधि : परिचय, माटो र हावापानी, खेतीगर्ने तरिका, बाली लगाएपछि ध्यानदिनुपर्ने कुराहरू</p> <p>(अ) कुरिलो</p> <p>(आ) क्यामोमाइल</p> <p>(इ) टिमु</p> <p>(ई) तेजपात</p> <p>(ई) चिराइतो</p> <p>३.६ नेपालमा जडीबुटीको बजार प्रणाली : बाली सङ्कलन, भण्डारण, उत्पादन र बजार मूल्य, उपयोग, आम्दानी तथा खर्च विवरण</p> <p>३.७ जडीबुटीको खेती प्रविधि : हावापानी, माटो, उपयुक्त प्रजाति (Suitable)</p>	१०

			genotype), प्रसारण, किरा र रोगको प्रकोप, विधि तथा प्रविधिको छनोट	
४	जडीबुटी सङ्कलन, भण्डारण, प्याकेजिङ र लेबलिङ	<p>४.१ जडीबुटीको दिगो सङ्कलन तथा व्यवस्थापन : पारिस्थितिकीय ज्ञान, प्रजनन र जीवनचक्र, प्राकृतिक शत्रु (किरा रोग), स्रोत र यसको उपलब्धता, वातावरण, बजार</p> <p>४.२ सङ्कलन प्रविधि, दिगो सङ्कलन गर्दा ध्यान पुऱ्याउनुपर्ने आवश्यक पक्षहरू</p> <p>: परिपक्व अवस्था, समय, पुनःउत्थानमा पर्ने प्रभाव, समुदायमा प्रभाव, उचित परिमाण</p> <p>४.३ जडीबुटीको सङ्कलन योग्य अङ्ग, समय, ऋतु र तरिका</p> <p>४.४ जडीबुटी सङ्कलन केन्द्र</p> <p>४.५ जडीबुटीको दिगो सङ्कलन तथा व्यवस्थापनमा देखापरेका समस्याहरू : आगलागी, उत्पादनभन्दा सङ्कलनका जोड, खेती र जडीबुटी सङ्कलनको समय व्यवस्थापन, खराब मौसम, भूधरातलीय प्रकृति, विज्ञ सङ्कलक तथा वैज्ञानिक तरिका, उत्पादनस्थलको संरक्षण तथा विस्तार</p> <p>४.६ आयुर्वेदिक पद्धतिअनुसार जडीबुटी सङ्कलनविधि</p> <p>४.७ जडीबुटी भण्डारण, यसको आवश्यकता र भण्डारणका फाइदाहरू</p>	<p>४.१ जडीबुटीको भण्डारण गर्दा ध्यान पुऱ्याउनुपर्ने पक्षहरू</p> <p>४.१.१ घाममा सुकाउने, छायामा सुकाउने, नियन्त्रित तापक्रममा सुकाउने (सोलार ड्रायर, अगेना-चुलो) माथि राखेर सुकाउने</p> <p>४.१.२ जडीबुटी भण्डारण गर्ने तरिका : प्रशोधन, वाष्पीकरण, सत्त्वांश विधि वा सत्त्व सङ्कलन विधि</p> <p>४.२ सुगन्धित तेल वा सारको भण्डारण</p> <p>४.३ आयुर्वेदिक पद्धतिअनुसार जडीबुटी भण्डारण र जडीबुटी सङ्कलन केन्द्र</p> <p>४.४ अतिस, कुट्की, जटामसी, लौठसल्ला, सतुवा, अमला, कुरिलो, मेन्था र अश्वगन्धाको असल खेती, सङ्कलन तथा भण्डारण अभ्यास</p> <p>४.५ जडीबुटी प्याकेजिङ र यसका मुख्य विशेषता</p> <p>४.६ जडीबुटीको लेबलिङ र यसका प्रकार</p> <p>४.७ जडीबुटी भण्डारणका आयुर्वेदिक तथा आधुनिक विधिको तुलना, जडीबुटी खेती एवम् सङ्कलनको असल अभ्यास (GACP), जडीबुटी भण्डारको असल अभ्यास (Good Storage Practice)</p>	१५
५.	जडीबुटी प्रशोधन	<p>५.१ प्रशोधन परिचय र महत्त्व</p> <p>५.२ मूल्यअभिवृद्धि र यसका फाइदाहरू</p> <p>५.३ जडीबुटी प्रशोधनका प्रारम्भिक चरणहरू : सरसफाइ, आकारमा</p>	<p>५.१ डिस्टिलेसन, स्टिम डिस्टिलेसन तथा सुगन्धित तेलको शुद्धीकरण</p> <p>५.२ सुगन्धित तेलको भण्डारण</p>	१०

		<p>कमी, ग्रेडिड, फोरिन म्याटरछुट्टयाउने, सुकाउँदाका हुने फाइदा र बेफाइदाहरू, सुकाउने विधिहरू</p> <p>५.४ जडीबुटी प्रशोधनका परम्परागत तथा आधुनिक विधि</p> <p>५.५ सुगन्धित तेल प्रशोधन विधि : वाटरडिस्टिलेसन, वाटरस्टिम</p> <p>५.६ जडीबुटीको नेपालको बजार प्रणाली</p>	<p>५.३ प्रयोगशालामा सुगन्धित तेल उत्पादनगर्ने तरिका</p> <p>५.४ औद्योगिक स्तरमा सुगन्धित तेल उत्पादनगर्ने तरिका</p> <p>५.५ सारतत्त्वको परिभाषा र सारतत्त्व बनाउने विधिहरू</p> <p>५.६ सार तत्त्व निकाल्न प्रयोग गर्ने घोलकहरू : पानी, मिथाइल अल्कोहल, इथाइल अल्कोहल, हेक्जेन ।</p> <p>५.७ जडीबुटीको अन्तर्राष्ट्रिय बजार प्रणाली</p>	
६	जडीबुटीको उपयोग र प्रयोग	<p>६.१ जडीबुटीको आयुर्वेदमा प्रयोग</p> <p>६.२ जडीबुटीको प्रयोग गरी उपचार पद्धति र प्राकृतिक चिकित्सामा प्रयोग विधि</p> <p>६.३ जडीबुटीको सोवा रिगपामा प्रयोग</p> <p>६.४ जडीबुटीको होमियोपेथीमा प्रयोग</p>	<p>६.१ जडीबुटीको परम्परागत चिनियाँ चिकित्सामा प्रयोग</p> <p>६.२ जडीबुटीको आधुनिक चिकित्सामा प्रयोग</p> <p>६.३ जडीबुटीको सौन्दर्य चिकित्सा र जैविक कृषिमा प्रयोग</p> <p>६.४ जडीबुटीको स्पा र एरोमा थेरापीमा प्रयोग</p> <p>६.५ खाद्यपोषणका रूपमा जडीबुटी</p>	१०
७	जडीबुटीको संरक्षण	<p>७.१ जडीबुटी संरक्षणका लागि स्थानीय सिप</p> <p>७.२ कुटकी, जटामांसी, लोठसल्ला, अशोक र रुद्राक्ष जस्ता लोपोन्मुख जडीबुटीको संरक्षण</p> <p>७.३ स्थानीय स्तरमा पाइने जडीबुटीको नर्सरी व्यवस्थापन</p> <p>७.४ स्थानीय स्तरमा पाइने जडीबुटीको व्यावसायिक खेती तथा खेती तथा अनुसन्धानका लागि प्राथमिकतामा परेका जडीबुटी</p> <p>७.५ जडीबुटीको बजार व्यवस्थापनमा देखापरेका समस्या र चुनौतीहरू</p>	<p>७.१ जडीबुटी एवम् गैरकाष्ठ वनपैदावारको संरक्षण : प्राकृतिक वासस्थानमा संरक्षण, घरेलु संरक्षण,</p> <p>७.२ जडीबुटीसँग सम्बन्धित राष्ट्रिय तथा अन्तरराष्ट्रिय ऐन, नियम, सम्बन्धित निकाय र साइटिसको भूमिका</p> <p>७.३ नेपाली जडीबुटीको व्यवसाय र उद्योग : व्यवसायको प्रकृति, रोजगारको क्षेत्र, व्यवस्थापन र नवीकरण</p> <p>७.४ नेपालको आर्थिक विकास र अनुसन्धानका लागि प्राथमिकता प्राप्त जडीबुटीहरूको विवरण</p> <p>७.५ नेपालमा जडीबुटी आयात तथा निर्यातको विवरण</p>	१५

		७.६ नेपाल सरकारले संरक्षण गरेका जडीबुटीहरू	
सैद्धान्तिक			८०
प्रयोगात्मक तथा परियोजना कार्य			८०
जम्मा			१६०

५. प्रयोगात्मक तथा परियोजना कार्य

यस विषयमा तल उल्लिखित प्रयोगात्मक तथा परियोजना कार्य गराई तिनको अभिलेख राख्नुपर्ने छ । यसका अतिरिक्त शिक्षकले स्थानीय परिवेश अनुरूपका स्थानीय कार्यकलाप समेत गराउन सक्ने छन् ।

कक्षा ११		कक्षा १२	
विषयक्षेत्र	कार्य घण्टा	विषयक्षेत्र	कार्य घण्टा
जडीबुटीको परिचय सम्बद्ध विषयक्षेत्रमा आधारित भई सोधखोज, सामग्री अध्ययनलगायतका कार्य गरी त्यसका आधारमा प्रतिवेदन तयारी र प्रस्तुति	९	जडीबुटीको परिचय विषयक्षेत्रका सामग्री अध्ययनलगायतका कार्य गरी त्यसका आधारमा प्रतिवेदन प्रस्तुति	९
जडीबुटीको पहिचान र वर्गीकरणसँग सम्बन्धितविषयक्षेत्रमा आधारित परियोजना कार्यको अभिलेख	९	जडीबुटीको पहिचान र वर्गीकरण सम्बन्धी विषयवस्तुमा आधारित प्रयोगात्मक कार्य	९
जडीबुटी खेतीसँग विषयक्षेत्रको सोधखोज, सामग्री अध्ययनलगायतका कार्य गरी त्यसका आधारमा प्रतिवेदन तयारी र प्रस्तुति	९	जडीबुटी खेती सम्बद्ध विषयक्षेत्रमा आधारित प्रयोगात्मक कार्य	९
जडीबुटी सङ्कलन, भण्डारण, प्याकेजिङ र लेबलिङसम्बन्धी परियोजना कार्य	१७	जडीबुटीको पहिचान, नमुना सङ्कलन, हर्बेरियम निर्माण तथा प्रदर्शन सम्बन्धी परियोजना कार्य	१७
जडीबुटी प्रशोधनसम्बद्ध विषयक्षेत्रमा आधारित भई लघुपरियोजना कार्य	९	जडीबुटी प्रशोधन विषयक्षेत्रमा आधारित भई लघुपरियोजना कार्य	९
जडीबुटीको उपयोग र प्रयोग गर्ने तरिकासँग विषयक्षेत्रको सोधखोज, सामग्री अध्ययनलगायतका कार्य गरी त्यसका आधारमा प्रतिवेदन तयारी र प्रस्तुति	९	जडीबुटीको उपयोग र प्रयोग गर्ने तरिकासम्बद्ध विषयक्षेत्रमा आधारित प्रयोगात्मक कार्य	९
जडीबुटीको संरक्षणसम्बन्धी परियोजना कार्य	१८	जडीबुटीको संरक्षणसम्बन्धी परियोजना कार्य	१८
जम्मा	८०	जम्मा	८०

६. सिकाइ सहजीकरण विधि तथा प्रक्रिया

जडीबुटी विषयको सिकाइ सहजीकरण गर्दा विद्यार्थीहरूको पूर्वअनुभवसँग सम्बन्धित गराएर प्रत्येक पाठको सुरुआत गर्नुपर्छ । आफूले देखे, सुने तथा पहिचान तथा प्रयोग गरेका जडीबुटीसँग सम्बन्धित विषयवस्तु एवम् क्रियाकलापलाई उदाहरण राखी यस विषयको अध्यापन गराइएमा प्रभावकारी हुन्छ । पाठको प्रस्तुतीकरणको प्रारम्भमा सामान्यतया छलफल विधिको प्रयोग गर्नुपर्छ । शिक्षण सिकाइ क्रियाकलापमा अवलोकन, प्रदर्शन र प्रयोगलाई प्राथमिकता दिनुपर्छ । विषयवस्तुको प्रस्तुतिपछि विद्यार्थीहरूलाई नै उदाहरण वा सामाधान खोज्न लगाउनुपर्छ । विद्यार्थीको रुचि, आवश्यकता तथा सामाजिक परिवेशलाई विचार गरेर कक्षाको वातावरणअनुसार सिर्जनात्मक पक्षमा सिकाइ सहजीकरण क्रियाकलाप सञ्चालन गर्नुपर्छ । सिकाइलाई बोधको स्तरमा मात्र सीमित नराखी पूर्णता प्रदान गर्नका लागि पर्याप्त सिकाइ अवसर दिई सिर्जनात्मक पक्षमा प्रयोग गर्नुपर्दछ ।

निर्दिष्ट उद्देश्य प्राप्तिका लागि सिकाइ सहजीकरण क्रियाकलाप सञ्चालन गर्न विभिन्न विधिको प्रयोग गर्न सकिन्छ । यस विषयमा छलफल, प्रश्नोत्तर, प्रयोग तथा प्रयोगशाला, आगमन, अवलोकन, भ्रमण, सोधखोज, परियोजना तथा निर्देशित समस्या समाधान, प्रदर्शन, व्याख्यान जस्ता विधिहरूलाई विषयवस्तुको स्वरूप तथा परिस्थितिअनुकूल हुने गरी प्रयोग गर्न सकिन्छ । यहाँ प्रस्तुत विधिहरू नमुना वा सङ्केत मात्र हुन् । सबै परिस्थितिमा यी विधिले मात्र पूर्णता नपाउन सक्छ । त्यसैले प्रत्येक शिक्षकले यहाँ प्रस्तुत गरिएका विधिलाई एउटा आधारका रूपमा लिई आनो ठोस परिस्थितिअनुकूल शिक्षण विधि तथा प्रक्रियाको छनोट गर्नुपर्दछ ।

७. विद्यार्थी मूल्याङ्कन

विद्यार्थीको सिकाइ उपलब्धि सुनिश्चित गर्न निर्माणात्मक र निर्णयात्मक दुवै प्रकारको मूल्याङ्कन गर्नुपर्ने छ । विद्यार्थीको सिकाइ उपलब्धि सुधारका लागि कक्षा शिक्षणकै क्रममा कक्षाकार्य, परियोजना कार्य, प्रस्तुतीकरण, उपलब्धि परीक्षा जस्ता क्रियाकलाप गराई सैद्धान्तिक तथा प्रयोगात्मक ज्ञान तथा सिप हासिल गराउन आवश्यक छ । यसको प्रभावकारी रूपमा कार्यान्वयन तथा विद्यार्थीको सिकाइस्तर सुधार गर्न सिकाइ सहजीकरण क्रियाकलापको अभिन्न अङ्गका रूपमा निर्माणात्मक मूल्याङ्कनलाई उपयोग गर्नुपर्छ । निर्माणात्मक मूल्याङ्कनको सिकाइ उपलब्धिको निश्चित भारलाई निर्णयात्मक मूल्याङ्कनमा समेत जोडिने छ ।

पाठ्यक्रमले निर्धारण गरेका उद्देश्यअनुरूप विद्यार्थीहरूले ज्ञान, सिप तथा अभिवृत्ति प्राप्त गर्न सके सकेनन् भन्ने कुरा पत्ता लगाउने महत्त्वपूर्ण संयन्त्र मूल्याङ्कन हो । विद्यार्थीहरूको मूल्याङ्कन गर्दा सिकाइ उपलब्धिहरूलाई ध्यान दिई सक्षमता र सिकाइ उपलब्धिअनुरूप सिकाइको सबै स्तरलाई समेटेर गर्नुपर्दछ । आन्तरिक र बाह्य मूल्याङ्कनमार्फत यस विषयको मूल्याङ्कन हुने छ । मूल्याङ्कनको कुल भारमध्ये ५० प्रतिशत आन्तरिक र ५० प्रतिशत बाह्य मूल्याङ्कन हुने छ । यसै गरी बाह्य मूल्याङ्कनअन्तर्गत लिखित परीक्षा सञ्चालन हुने छ । विद्यार्थी मूल्याङ्कनअन्तर्गत निर्माणात्मक र निर्णयात्मक मूल्याङ्कन दुवै तरिकाबाट नै गरिने छ । यस विषयका पाठ्यक्रममा समावेश गरिएका तहगत सक्षमताहरू, कक्षागत सिकाइ उपलब्धि र तिनका विषयवस्तुसोसँग सम्बन्धित सिप, सिकाइ सहभागिता र सिकाइसक्रियताका आधारमा विद्यार्थीहरूको सिकाइको मूल्याङ्कन गर्नुपर्दछ ।

(क) आन्तरिक मूल्याङ्कन

आन्तरिक मूल्याङ्कनका लागि प्रत्येक विद्यार्थीहरूले गरेका कार्य र उनीहरूमा आएको व्यवहार परिवर्तनको अभिलेख राखी सोका आधारमा अङ्क प्रदान गर्नुपर्दछ । विद्यार्थीहरूले सिके नसिकेको पत्ता लगाई नसिकेको भए कारण पहिचान गरी पुनः सिकाइन्छ भने यस्तो मूल्याङ्कन प्रक्रियालाई निर्माणात्मक मूल्याङ्कन भनिन्छ । कक्षा ११ र १२ को जडीबुटी विषय सिकाइका क्रममा कक्षाकोठामा कक्षागत शिक्षण सिकाइकै अभिन्न अङ्गका रूपमा गृहकार्य, कक्षाकार्य, परियोजना कार्य, सामुदायिक कार्य, सह/अतिरिक्त क्रियाकलाप, एकाइ परीक्षा, मासिक परीक्षा जस्ता मूल्याङ्कनका साधनहरूको प्रयोग गर्न सकिने छ र मूल्याङ्कनका लागि विद्यार्थीको अभिलेख राख्नुपर्छ । सोका आधारमा नै सिकाइ अवस्था यकिन गरिन्छ र आवश्यकतानुसार उपचारात्मक शिक्षण सिकाइ क्रियाकलाप सञ्चालन गर्नुपर्छ । विशेष सिकाइ आवश्यकता भएका विद्यार्थीका लागि विषय शिक्षकले नै उपयुक्त प्रक्रिया अपनाई मूल्याङ्कन गर्नुपर्छ । शिक्षकले यस प्रकारको मूल्याङ्कन निरन्तर रूपमा गरी विद्यार्थीहरूमा अपेक्षित सिप र व्यवहार विकासमा जोड दिनुपर्छ ।

जडीबुटी विषयमा कक्षा ११ र १२ मा ५०% आन्तरिक मूल्याङ्कन हुने छ । यसको मूल्याङ्कन निम्नानुसार हुने छ :

क्र.सं.	क्षेत्र	अङ्कभार
१.	कक्षा सहभागिता	३
२.	त्रैमासिक परीक्षाको मूल्याङ्कन	६
३.	परियोजना तथा प्रयोगात्मक कार्य, प्रतिवेदन लेखन तथा प्रतिवेदनको प्रस्तुति	१६
४	बाह्य विज्ञद्वारा प्रयोगात्मक कार्य तथा अन्तर्वार्ता	२५
जम्मा		५०

(ख) बाह्य मूल्याङ्कन

यस विषयमा कक्षा ११ र १२ मा ५० प्रतिशत बाह्य मूल्याङ्कन हुने छ । कक्षा ११ र १२ प्रत्येक कक्षामा लागि लिइने परीक्षाका लागि पाठ्यक्रम विकास केन्द्रले तयार गरेको विशिष्टीकरण तालिकाअनुसार प्रश्नपत्र निर्माण गर्नुपर्ने छ । यस विषयको परीक्षामा विशेष गरेर ज्ञान/बोध, समस्या समाधान, समालोचनात्मक, सिर्जनासँग सम्बन्धित प्रश्नहरू सोधिनेछन् । पाठ्यक्रमले निर्धारण गरेका उद्देश्यअनुरूप विद्यार्थीहरूले ज्ञान, सिप, अभिवृत्ति प्राप्त गरे नगरेको मूल्याङ्कन गरिन्छ । सबै बाह्य परीक्षामा अक्षराङ्कन पद्धतिको प्रयोग गरिने छ ।

Plumbing and Wiring

Grades: 11 and 12

Subject code: Plw. 435 (Grade 11) Plw. 436 (Grade 12)

Credit hrs: 5

Working hrs: 160

1. Introduction

Plumbing is any system that conveys fluids for a wide range of applications. Plumbing uses pipes, valves, plumbing fixtures, tanks, and other apparatuses to convey fluids. Heating and cooling, waste removal, and water delivery are among the most common uses of plumbing. Plumbing is used to ensure safe delivery of water. Clean water usage is made possible only through plumbing which is often taken for granted. It brings comfort to our life as we are able to use it in several functional areas such as kitchens and bathrooms with such an ease without having a thought of what it would have been if there was no supply of clean water for us. Plumbing industry today holds a strong economic importance as it provides job opportunities and livelihood for many. Similarly, electrical wiring is important and necessary part of life in the 21st century. With it, we enjoy lighting for our home, and heating and cooling to keep ourselves comfortable, and access to the countless appliances that make our lives better. By powering television and computers, it keeps us in touch with the outside world, and by powering alarms and security systems, it keeps our homes and our families safe. A properly installed electrical system will provide years of service with advancements like circuit breakers and proper insulation. That's why a reliable electrician can play such a vital role in the functioning of our home.

This course of plumbing and wiring specially focus on the general installation works related to plumbing and electrical installation. Besides this, it also provides the concept of different tools and equipment, fitting and accessories, types of installation works, precautions to be followed while performing installation works and so on. So, this course provides skills, practical knowledge, career opportunities and the employability skills needed in installation field of plumbing and wiring.

The curriculum consists of level-wise competencies, grade-wise learning outcomes, scope and sequence of contents with their elaboration, some methods and techniques of teaching and student assessment procedure.

2. Level-wise Competencies

At the end of grade 12, the students will have the following competencies:

- a. Follow the safety precautions needed for doing electrical and plumbing works.
- b. Identify the different tools and equipments needed for doing plumbing and electrical works along with their functions.
- c. Perform electrical installation works and plumbing works.
- d. Repair and maintain the electrical and plumbing works.
- e. Design a plumbing work for a particular place properly.
- f. Install an electrical appliance and any load at any desired locations with proper safety.
- g. Provide a proper level of safety for any kind of circuit.
- h. Perform a domestic electrical works and plumbing works properly.

3. Gradewise Learning Outcomes:

Grade 11		Grade 12	
Content area	Learning outcomes	Content area	Learning outcomes
1. Introduction of Plumbing	1.1 Introduce plumbing and explain its importance 1.2 Use plumbing with sanitary 1.3 Identify the scope of plumbing	1. Pipe Threading to Dimension	1.1 Explain and show the method of fixing pipe to pipe vice 1.2 Measure pipe to millimeter 1.3 Describe the measuring methods 1.4 Explain and demonstrate the method of die holding/threading. 1.5 Demonstrate the method of die checking/cleaning/oiling 1.6 Explain and show the method of die tightening and loosening/fixing cutter 1.7 Explain and show method of checking accurate threading and its sharpness 1.8 Demonstrate and Explain the method of loosening the die, fix the pipe to die and repeat the threading twice for sharpness.
2. Tools for Plumbing	2.1 Demonstrate different holding tools like bench vice, pipe vice 2.2 Show different fitting tools like pipe wrenches, spanners, wrench chain, adjustable wrench, water-pump pliers etc. 2.3 Demonstrate different cutting tools like pipe cutter, hacksaw etc. along with their use	2. Assembling the Threaded Pipe to Fittings with Pipe Tape as per Drawing	2.1 Demonstrate the drawings in detail. 2.2 Arrange the fittings and threaded pipes in position and assemble the fittings with pipe tape to pipe in position 2.3 Check the tightness/testing pipe joints 2.4 Adjust measurement 2.5 Show method of marking, laying, using chalk line to wall/floor/ceiling

	<p>and care adjustment.</p> <p>2.4 Demonstrate different pipe bending tools like bending machine, threading dies, stocks and dies etc.</p> <p>2.5 Show other different tools like drilling machine, measuring tape, soldering iron, tin snips, caulking iron, different types of hammers etc.</p> <p>2.6 List the different folding rules.</p> <p>2.7 Make use of try square, vernier caliper joining elements: nuts, bolts, washer, pins, rover jumper, screws and rivets and jute/pipe tape and lead, spirit level, plumb rule and bob, file, plier, rasp and screw driver.</p> <p>2.8 Know about the safety rules in plumbing works</p>		<p>2.6 Cut accurate pipe with margin of necessary threads to pipe</p> <p>2.7 Fixing pipe to pipe vice</p> <p>2.8 Identify the positioning techniques</p>
3. Plumbing Pipes and Material	<p>3.1 Understand plumbing pipes and their types: Cast Iron (CI) pipes, Ductile iron pipes, Steel pipes, Galvanized Iron (GI) pipes, Copper pipes, Asbestos Cement (AC) pipes, Concrete pipes, Stone ware pipes, PVC (Polyvinyl Chloride) pipes - Chlorinated PVC (CPVC) pipes, UPVC pipes, Polypropylene pipes,</p>	3. Making up H.D.P fittings	<p>3.1 Introduce and demonstrate the HDP pipe and fittings.</p> <p>3.2 Explain and demonstrate hot plate with power</p> <p>3.3 Use HDP pipe with necessary diameters</p> <p>3.4 Cut pipe to 90⁰ using miter box</p> <p>3.5 Clean, trim and weld the two halves of pipe to form 90⁰ elbow (L) , making tee, making wyes (Y)</p>

	<p>PEX or XLPE, Unplasticised Polyvinyl pipes,</p> <p>3.2 Know plumbing materials Sealing Material (thread seal tape), plumber's putty and Sealing adhesives.</p> <p>3.3 List out the different steps involved in laying of pipe.</p>		
<p>4. G.I./PVC Pipe Fittings, Joints and Valves</p>	<p>4.1 Determine pipe fitting and its types: pipe nipples Collars elbows - Long Radius (LR), Short Radius (SR), 90° and 45° Elbow.</p> <p>Gasket (Flange unions) Union</p> <p>Reducer Tee, Reducing tee</p> <p>Cross, reducing cross, offsets</p> <p>Sockets, reducing sockets, Single tee socket and double tee socket.</p> <p>Valve. Sluice Valve, Scour valve, Air valve G.I gate valve (heavy and light) and types Foot valve/Glove valve Pipe tape</p> <p>Float valve or ball valve.</p> <p>4.2 Lay GI pipes in buildings (internal works)</p> <p>4.3 Use pipe joints and its types: threaded joint, welded joint</p>	<p>4. Introduction of Welding</p>	<p>4.1 Select electric power needed for welding</p> <p>4.2 Introduce and demonstrate welding rods</p> <p>4.3 List the welding safety rules</p> <p>4.4 Introduce arc welding equipment, accessories and protective gear</p> <p>4.5 Introduce welding techniques and explain its types with and use. (gas welding)</p> <p>4.6 Explain and demonstrate forging techniques</p>

	(butt welded, socket welded), brazed joint, soldered joint, grooved joint, flanged joint, compression joint.		
5. Measurements and symbols used in plumbing	<p>5.1 Measure different parameters of plumbing like length, area, volume, weight, pressure, density etc.</p> <p>5.2 Use the conversion table for length, volume, weight, pressure and density, etc.</p> <p>5.3 Use measuring instruments and measuring tools: Steel ruler, Caliper, Micrometer screw gauge, Vernier Caliper, measuring tape, Pressure gauge,</p> <p>5.4 List the different symbols used in plumbing and its importance.</p>	5. Bar Bending Works	<p>5.1 Introduce and demonstrate straight making bars methods</p> <p>5.2 Introduce and demonstrate bar tying methods.</p> <p>5.3 List categories of bars, e.g. mild steel bar T.O.R steel bar and TORKARI bars.</p> <p>5.4 Make L(Hook), procedure to Hook making, die and bench</p> <p>5.5 Making 45 degrees crank procedure</p> <p>5.6 Making chair to fix reinforcement methods</p> <p>5.7 Making overlaps to steel bars.</p>
6. Tools and accessories.	<p>6.1 Make use of proper tools and handle correctly.</p> <p>6.2 Use tools accessories, materials and fixture etc.</p> <p>6.3 List the different types of switches with their application</p> <p>6.4 Use different lamps as per their applications.</p> <ul style="list-style-type: none"> - Discharge lamps - Sodium Vapour lamp - Mercury Vapour 	6. Fixing or Fastening Rods to Wire	<p>6.1 Explain and show the single knot and double knot tying to slab methods</p> <p>6.2 Explain and show tying to beam methods and tying to column methods</p> <p>6.3 Check tightness of stirrups to main bar loops</p> <p>6.4 Making stirrups or rings</p>

	<p>lamp</p> <ul style="list-style-type: none"> - Fluorescent lamp - CFL - LED (SMD, COB, Colour of led, Power leds) <p>6.5 List out the different types of sockets with their application.</p> <p>6.6 Design distribution box (DB) and identify the size to be used. (Junction box, D.B Box, Gang box, Power socket Box)</p>		
7. Concept of electricity	<p>7.1 Make concept of atom and its sub atomic particles and charge.</p> <p>7.2 Understand electricity and its types,</p> <p>7.3 Introduce Alternating Current (AC) and Direct Current (DC) and list their applications.</p> <p>7.4 Differentiate AC and DC</p>	7. Wires and cable	<p>7.1 Introduce the concept of wire and cable and list out its types: PVC, STC, armored, Non. armored cable</p> <p>7.2 Show types and sizes of wire in metric unit and SWG.</p> <p>7.3 Select wire and cable as per application.</p> <p>7.4 Describe the current carrying capacity according to S.W.G.</p>
8. Electric Circuit	<p>8.1 Know the concept of electric circuit and list out the requirements of a circuit.</p> <p>8.2 Introduce different types of circuit</p> <p>8.3 List out the symbols used in electric circuit</p> <p>8.4 Introduce electric current with its unit.</p>	8. Installation wiring system / Electrical Drawings	<p>8.1 Introduce the wiring system and its types along with their advantages and disadvantages.</p> <p>8.2 List the different types of wiring mentioning their main characteristics/</p> <p>8.3 Select the type of wiring to be used.</p> <p>8.4 List out the different rules of wiring.</p>

	<p>8.5 Differentiate potential difference and electromotive force.</p> <p>8.6 Apply Ohms law.</p> <p>8.7 Arrange the resistors in series and parallel combination and find its equivalent resistance.</p> <p>8.8 List advantages of series and parallel connection.</p> <p>8.9 Apply Kirchoffs laws to circuit.</p> <p>8.10 Solve simple numerical.</p>		<p>8.5 Explain and demonstrate the concept of wire draw techniques and its types: layout or schematic diagram, circuit or wiring diagram, single line diagram</p>
9. Electrical Power and Energy	<p>9.1 Introduce electric energy and power.</p> <p>9.2 Solve numerical examples.</p>	9. Protective devices and Earthing	<p>9.1 Introduce protective devices in wiring along with their advantages.</p> <p>9.2 Explain and demonstrate the concept of fuse and its type. (rewirable and non rewirable).</p> <p>9.3 Select and identify fuse/MCB and their rating</p> <p>9.4 Introduce earthing and its types along with their importance.</p> <p>9.5 Use different methods of earthing: strip, rod, ipe, plate as per the condition.</p>
10. Cell and Battery	<p>10.1 Introduce cell and battery and list their types. (primary and secondary)</p> <p>10.2 Combine Different cells and find the equivalent emf.</p> <p>10.3 Demonstrate charging and</p>	10 . Three phase Circuit	<p>10.1 Introduce three phase system and its application</p> <p>10.2 Visualize idea for generation of 3-phase emf. and know about phase sequence.</p> <p>10.3 Differentiate balance and unbalanced three phase system.</p>

	<p>discharging process of cell: voltage control method, current control method</p> <p>10.4 Explain the capacity of cell.</p>		<p>10.4 List the different types of connection in three phase system and define the terminologies.</p> <p>10.5 Calculate power in three phase circuit</p> <p>10.6 List out the advantages of three phase systems.</p>
--	------------------------------------------------------------------------------------------------------------------------------	--	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

4. Scope and Sequence of Content

Unit	Class 11			Class 12		
	Scope	Content	Working hrs.	Scope	Content	Working hrs.
	Introduction of Plumbing	<p>1.1 History of plumbing.</p> <p>1.2. Importance of plumbing</p> <p>1.3. Plumbing and sanitary</p> <p>1.4. Scope of plumbing</p>	2	Pipe Threading to Dimension	<p>1.1. Fixing pipe to pipe vice</p> <p>1.2. Measuring pipe to millimeter</p> <p>1.3. Measuring methods</p> <p>1.4. Die holding/threading methods</p> <p>1.5. Die checking/cleaning/oiling</p> <p>1.6. Die tightening and loosening/fixing cutter</p> <p>1.7. Checking accurate threading and its sharpness</p> <p>1.8. Loosening the die fixing the pipe to die and repeat the threading twice for sharpness. (Repeat)</p>	6
	Tools for Plumbing	<p>2.1. Holding tools</p> <p>2.1.1 Bench vice</p> <p>2.1.2 Pipe Vice</p> <p>2.2. Fitting tools</p> <p>2.2.1 Pipe wrenches of different sizes</p>	12	Assembling the Threaded Pipe to Fittings with Pipe Tape as per Drawing	<p>2.1. Visualization of drawing in detail</p> <p>2.2. Collecting the fittings</p> <p>2.3. Collecting the threaded pipes in position</p> <p>2.4. Fixing the fittings</p>	8

	<p>2.2.2 Spanners of various size</p> <p>2.2.3 Wrench chain</p> <p>2.2.4 Adjustable wrench</p> <p>2.2.5 Water-pump pliers</p> <p>2.3 Cutting tools</p> <p>2.3.1 Pipe cutter-use and care adjustment of cutting wheels.</p> <p>2.3.2 Hacksaw frame and blade</p> <p>2.4 Pipe bending tools</p> <p>2.4.1 Pipe bending machine</p> <p>2.4.2 Threading dies</p> <p>2.4.3 Stocks and dies, up to 2" diameter, replacement of cutters</p> <p>2.5 Other tools</p> <p>2.5.1 Drilling machine and Drill bits.</p> <p>2.5.2 Measuring tape</p> <p>2.5.3 Pair of footprints.</p> <p>2.5.4 Soldering iron</p> <p>2.5.5 Tin snips</p> <p>2.5.6 Caulking iron</p> <p>2.5.7 Hammer: Claw hammers /Ball pin hammer</p> <p>2.5.8 Folding rules: metallic/steel</p>			<p>with pipe tape to pipe in position</p> <p>2.5. checking the tightness/testing pipe joints</p> <p>2.6. Adjusting measurement</p> <p>2.7. Marking, laying, using chalk line to wall/floor/ceiling</p> <p>2.8. Accurate pipe cutting with margin of necessary threads to pipe</p> <p>2.9. Fixing pipe to pipe vice</p> <p>2.10. Positioning techniques.</p>	
--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

		<p>2.5.9 Try square, Vernier caliper joining elements: Nuts, bolts, washer, pins, Rover jumper, screws and rivets and jute/pipe tape and lead, Spirit level, Plumb rule and bob, File, Plier, Rasp and Screw driver.</p> <p>2.6 Safety during plumbing work</p>				
	Plumbing Pipes and Material	<p>3.1. Plumbing pipes and their types: Cast Iron (CI) pipes, Ductile iron pipes, Steel pipes, Galvanized Iron (GI) pipes, Copper pipes, Asbestos Cement (AC) pipes, Concrete pipes, Stone ware pipes, PVC (Polyvinyl Chloride) pipes - Chlorinated PVC (CPVC) pipes, UPVC pipes, Polypropylene pipes, PEX or XLPE, Unplasticised Polyvinyl pipes,</p> <p>3.2. Plumbing materials: Sealing Material (thread Seal tape), plumber's putty and Sealing adhesives.</p> <p>3.3. Steps involved in laying of pipes.</p>	10	Making up H.D.P fittings	<p>3.1. Definition of HDP pipe and fittings</p> <p>3.2. Collecting hot plate with power</p> <p>3.3. Collecting HDP pipe with necessary diameters</p> <p>3.4. using miter box cutting pipe to 90⁰</p> <p>3.5. Clean, trim and weld the two halves of pipe to form 90⁰ elbow (L)</p> <p>3.6. Making Tee</p> <p>3.7. Making Wyes (Y)</p>	6
	G.I./PVC Pipe Fittings,	4.1. Pipe Fittings and Types	10	Introduction of Welding	4.1. Electric power needed for welding	6

	<p>Joints and Valves</p>	<p>4.2 pipe nipples</p> <p>4.3 Collars</p> <p>4.4 Elbows - Long Radius (LR), Short Radius (SR), 90° and 45° Elbow.</p> <p>4.5 Gasket (Flange unions)</p> <p>4.6 Union</p> <p>4.7 Reducer</p> <p>4.8 Tee, Reducing tee</p> <p>4.9 Cross, reducing cross, offsets</p> <p>4.10 Sockets, reducing sockets, Single tee socket and double tee socket.</p> <p>4.11 Valve. Sluice Valve, Scour valve, Air valve</p> <p>4.11. G.I gate valve (heavy and light) and types</p> <p>4.12. Foot valve/Glove valve</p> <p>4.13. Pipe tape</p> <p>4.14. Float valve or ball valve.</p> <p>4.15 Laying of GI pipes in buildings (Internal Work)</p> <p>4.16 Pipe joints and types of pipe joints: Threaded joint, Welded joint (butt welded, socket welded), Brazed joint, Soldered joint, Grooved joint, Flanged joint, Compression joint.</p>			<p>4.2. Welding rods</p> <p>4.3. Welding safety rules</p> <p>4.4. Arc welding equipment, accessories and protective gear</p> <p>4.5. Welding Techniques</p> <p>4.6. Types of welding</p> <p>4.7. Principles of gas welding and its use</p> <p>4.8. Gas welding techniques</p> <p>4.9. Forging techniques</p>	
--	---------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	--	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

	<p>Measurements and symbols used in plumbing</p>	<p>5.1 Measurement of length, area, volume and weight</p> <p>5.2 Measurement of Pressure</p> <p>5.3 Measurement of density</p> <p>5.4 Conversion table for length, volume, weight, Pressure and density, etc.</p> <p>5.5 Measuring instruments, measuring tools: Steel ruler, Calliper, Micrometer screw gauge, Vernier Calliper, measuring tape, Pressure gauge,</p> <p>5.6 Importance of Plumbing Symbols. Plumbing Symbols (Drawings).</p>	4	<p>Bar Bending Works</p>	<p>5.1. Straight making bars methods</p> <p>5.2. Bar tying methods.</p> <p>5.3. Categories of bars, e.g. Mild steel bar T.O.R steel bar and TORKARI bars.</p> <p>5.4. Making L(Hook), procedure to Hook making, die and bench</p> <p>5.5. Making 45 degrees crank procedure</p> <p>5.6. Making chair to fix reinforcement methods</p> <p>5.7. Making overlaps to steel bars.</p>	6
6	<p>Tools and accessories.</p>	<p>6.1. Identify and select proper tools and handle correctly.</p> <p>6.1.1 Different types of tools and accessories</p> <p>6.1.2 Proper handling of tools.</p> <p>6.1.3 Differentiate with tools, equipment, materials and accessories</p> <p>6.2. Identify various type, sizes, rating of switch, lamps, sockets, power sockets,</p>	14	<p>Fixing or Fastening Rods to Wire</p>	<p>6.1. Single knot tying to slab methods</p> <p>6.2. Double knot tying to slab methods</p> <p>6.3. Tying to beam methods</p> <p>6.4. Tying to column methods</p> <p>6.5. Checking tightness of stirrups to main bar loops</p> <p>6.6. Making stirrups or rings</p>	6

		<p>wall and ceiling fixtures, junction boxes, distribution boards and components.</p> <p>6.2.1. Working procedure of using tools accessories, materials and fixture etc.</p> <p>6.3.2 Types of switches</p> <p>6.3.3 Types of lamps (Construction, Working principle, applications)</p> <ul style="list-style-type: none"> - Incandescent lamp - Discharge lamps <ul style="list-style-type: none"> - Sodium Vapour lamp - Mercury Vapour lamp - Fluorescent lamp - CFL - LED (SMD, COB, Colour of led, Power leds) <p>6.3.4 Types of Socket</p> <p>6.3.5 Definition and Size of boxes(Junction box, D.B Box, Gang box, Power socket Box)</p>				
7	Concept of electricity	7.1. Concept of Atom and charge	6	Wires and cable	7.1. Definition, identification, sizes,	10

		<ul style="list-style-type: none"> • Electron • Proton • Neutron <p>7.2. Introduction to electricity.</p> <p>7.3. Types of Electricity.</p> <ul style="list-style-type: none"> • Static • Dynamic (Current Electricity) <p>7.4 Concept of AC and DC</p> <p>7.4.1 General concept of AC and DC</p> <p>7.4.2 Applications of AC and DC</p> <p>7.4.3 Differences between AC and DC.</p>			<p>types, material used</p> <p>7.1.1 Introduction of wire and cable</p> <ul style="list-style-type: none"> • Conductor Definition Properties of good conductor <ul style="list-style-type: none"> a. Bare b. Insulated • Stranded conductor • Solid conductor <p>7.1.2. Types of cable.</p> <ul style="list-style-type: none"> • PVC, STC, armored • Non. armored cable <p>7.2. Types and sizes of wire in metric unit and SWG.</p> <p>7.3 Selection of wire and cable</p> <p>7.4 Current carrying capacity table according to S.W.G</p>	
8.	Electric Circuit	<p>8.1 Introduction to Electric Circuit and requirements of simple circuit.</p> <p>8.2. Types of Electric circuits</p> <ul style="list-style-type: none"> • Open Circuit • Close Circuit • Short circuit • Leakage Circuit 	12	Installation wiring system / Electrical Drawings	<p>8.1. Introduction of wiring system</p> <ul style="list-style-type: none"> • Tree System • Distribution system • Advantages and disadvantages <p>8.2 Type of wiring, accessories, advantages and disadvantages.</p> <ul style="list-style-type: none"> • Cleat wiring system • Wood/PVC casing and capping system 	15

		<ul style="list-style-type: none"> • Series Circuit • Parallel Circuit • Mix Circuit <p>8.3 Symbols used in circuit.</p> <p>8.4. Concept and definition of electric current and its unit.</p> <p>8.5 Concept of potential difference and electromotive force</p> <p>8.6. Ohm's Law and its application.</p> <p>8.7. Connection of Resistances in Series and Parallel and its equivalent resistance.</p> <p>8.8. Uses and advantages of Series and Parallel Circuit.</p> <p>8.9 Kirchoff's laws (KCL, KVL)</p> <p>8.10. Solve simple numerical.</p>			<ul style="list-style-type: none"> • C.T.S/T.R.S Wiring System • Conduit Wiring System <p>a) Surface Conduit wiring</p> <p>b) Conceal conduit wiring</p> <p>8.3 Selection of wiring</p> <p>8.4 Rules of wiring</p> <p>8.5. Wire Drawing techniques.</p> <p>8.5..1. Concept of electrical drawing and its importance</p> <p>8.5.2. Types:</p> <ul style="list-style-type: none"> • Layout or schematic diagram • Circuit or wiring diagram • Single line diagram 	
9	Electrical Power and Energy	<p>9.1 Electrical power, its unit and practical application</p> <p>9.2 Electrical energy, its unit and practical application</p> <p>9.3 Simple numerical examples.</p>	4	Protective devices and Earthing	<p>9.1. Necessity of protective devices.</p> <p>9.2. Advantage of protective devices</p> <p>9.3. Types of fuse</p> <ul style="list-style-type: none"> • Fuse rewirable • Non rewirable types <p>9.4. Concept of fuse/MCB and its</p>	10

					<p>functions.</p> <p>9.5. Selection and identification of fuse/MCB and their rating</p> <p>Simple related numerical problems</p> <p>9.6. Introduction of Earthing</p> <ul style="list-style-type: none"> • system and equipment earthings, • Methods of Earthing <ul style="list-style-type: none"> ➤ Strip ➤ Rod ➤ Pipe ➤ plate <p>9.7. Importance of earthing and materials required.</p>	
10	Cell and Battery	<p>10.1 Introduction to Cell and Battery and its classification</p> <ul style="list-style-type: none"> • Primary • Secondary <p>10.2 Combination of cells</p> <p>10.3 Charging and discharging process of cell as:</p> <ul style="list-style-type: none"> • Voltage control method <p>1. Current</p>	6	Three phase Circuit	<p>10.1. Concept of three phase system.</p> <p>10.2 General idea of generation of 3-phase emf and phase sequence.</p> <p>10.3. Balance and unbalanced system</p> <p>10.4 Concept of Star connection and Delta connection</p> <p>10.5. Explain the following terms</p> <ul style="list-style-type: none"> • Line voltage • Phase voltage • Line current • Phase current <p>10.6. Relationship between line and phase quantities in star and</p>	7

		control method 10.4 Capacity of Cell (AH)			delta connection. 10.7. General idea of power in three phase circuit 10.8 Advantages of three phase over single phase	
	Total		80	Total		80

5. Suggested Practical/Project Activities

Practical is integral part of Secondary Education Curriculum. It focuses more on skill development than knowledge building. It consists of project work, group work, presentation, observation, internship etc. Total of 80 hours has been designated to practical activities and will be carried out under the guidance and monitoring of teacher. Following are only sample practical activities, teacher can assign any relevant practical activity as per requirement.

Grade 11			Grade 12		
Content area	Practical Working	Working hrs.	Content area	Practical Working	Working hrs.
1. Introduction of Plumbing	1. Observe the plumbing system in your school and draw the layout diagram of it.	1	1. Pipe Threading to Dimension	1. Cut/thread G.I pipe to given dimensions	4
2. Tools for Plumbing	1. Identify/enumerate/use hand tools and equipments. 2. Draw figures of plumbing and masonry tools.	6	2. Assembling the Threaded Pipe to Fittings with Pipe Tape as per Drawing	1. Join PVC fittings with PVC pipe. 2. Install PPR pipe with fittings. 3. Install CPVC pipe with fittings. 4. Perform internal (below ground level) pipe layout and assembling fittings using pipe tape for water supply or sanitation works. 5. Perform external (wall) pipe layout and joining fittings for water supply.	22

3. Plumbing Pipes and Material	<ol style="list-style-type: none"> 1. Demonstrate pipes, sealing tapes, plates to shape and size. 2. File to clean pipe end (mouth) and prepare a report of it. 	7	3. Making up H.D.P fittings	<ol style="list-style-type: none"> 1. Cut /join H.D.P. pipe and PVC pipe. 2. Make L, cross and T bends project of PVC pipe 	6
4. G.I./PVC Pipe Fittings, Joints and Valves	<ol style="list-style-type: none"> 1. Draw figures of the various types of bends/joints. 2. Make nipples to appropriate standard. 3. Make and assemble using various pipes as Elbow, Union and tee in a Rectangular Loop 4. Cut /join H.D.P. pipe and PVC pipe. 	21	4. Introduction of Welding	<ol style="list-style-type: none"> 1. Weld two plates of 10 mm thick together making butt joint, do filing on it. 	3
5. Measurements and symbols used in plumbing	<ol style="list-style-type: none"> 1. Measure the length, width and height of a room and calculate the area and volume. 2. Measure the weight of a brick and cement bag 3. Draw the plumbing symbols 	5	5. Bar Bending Works	<ol style="list-style-type: none"> 1. Perform 90°(L), 135° and 180° (hook) bends to reinforcing bars as per instruction. 	3
6. Tools and accessories.	<ol style="list-style-type: none"> 1. Demonstrate basic tools, use, and care, of combination pliers, cutter, Nose pliers, hammer, hacksaw, knife etc. 2. Demonstrate and discuss 	8	6. Fixing or Fastening Rods to Wire	<ol style="list-style-type: none"> 1. Tie reinforcement of 12 mm ø rods of tor steel @ 6" c/c spacing for a basement RCC footing slab of 1 mx1m size showing 15cm (L) at its ends, and tie the rods in a double knot method. 	3

	about size and application of wiring accessories.				
7. Concept of electricity	<ol style="list-style-type: none"> 1. Demonstrate the different sources of AC and DC and make list of them with their applications. 2. Show the waveform of AC and DC in oscilloscope. 	4	7. Wires and cable	<ol style="list-style-type: none"> 1. Demonstrate various size of wire 1.5, 2.5,4,6 mm²copper, flexible, Stranded and solid Core. Ask to cut in 10 cm length of each and strip out insulation 1 cm each side each piece. 2. Demonstrate various size of single core, two core, three core, three and half core and 4 core aluminum and copper cable 	4
8. Electric Circuit	<ol style="list-style-type: none"> 1. Familiarize with electrical instruments like voltmeter, ammeter, galvanometer, multimeter, power supply unit etc. 2. Measure the resistance of a resistor using voltmeter and ammeter. 3. Connect the resistors in series and parallel and calculate the equivalent resistance using voltmeters and ammeters. 4. Verification of Ohm's law. 	14	8. Installation wiring system / Electrical Drawings	<ol style="list-style-type: none"> 1. Connect two pin top(plug) and pediment out holder using medium size flexible wire for table lamp. (Strip wire and connect) 2. Connect 3 pin 15 amp switches/socket as per given layout diagram. 3. Make extension power cord using 3 nos (colour) wire 4mm², 3 pin plug and switch combined 3 pin 5/15 socket. 4. Connect single lamp control by single 5 amp switch in surface PVC trunking. 5. Connect single bell control by single push button switch in PVC trunking wiring. 6. Connect two lamp in parallel control by simple one-way 	25

				<p>switch.</p> <p>7. Connect one lamp by using one-way switch. Also connect two pin socket and indicator in 3 gang plate.</p> <p>8. Connect a lamp control separately by two simple switches. (two way switching)</p> <p>9. Connect two lamp in parallel control by a simple one-way switch and third lamp by another switch in a 2-way gang plate.</p> <p>10. Connect one lamp, one bell and a fan in a gang plate and also connect power socket 3 pin/ 15 A separately.</p> <p>11. Connect two or more lamp in parallel and control from three or more places. (intermediate switches)</p> <p>12. Install and connect energy meter, main switch and DB box (DPMCB 32A, SPMCB 16A and SPMCB 6A) to a different power and lighting circuits.</p> <p>13. Demonstrate PVC trunk wiring, conduit wiring and conceal conduit Wiring of buildings.</p> <p>14. Install and connect energy meter, main switch, one- way switch to control a bulb, 2 number of two switches to control another bulb,</p>	
--	--	--	--	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

				2 power sockets through a connecting wire using 2 pin plug. 15. Connect a circuit with 4 batteries in series and parallel and hence find the equivalent e.m.f.	
9. Electrical Power and Energy	1. Calculation of power in resistive circuit by using multi meter and verify it with watt meter reading. 2. Calculation of energy consumed by resistive circuit using multi meter for 10 minutes.	6	9. Protective devices and Earthing	1. Demonstrate tripping of MCB by short circuit and by blowing fuse. 2. Perform Rewiring of fuse and test it.	4
10. Cell and Battery	1. Connect a circuit with 4 batteries in series and parallel and hence find the equivalent e.m.f.	8	10. Three phase Circuit	1. Demonstrate 3-phase supply and 3-phase load and make list of them. 2. Demonstrate star and delta connection and write their applications. 3. Connect the load in star, measure line and phase currents and voltages. 4. Connect the load in delta, measure line and phase currents and voltages.	6
		80			80

6. Learning Facilitation Process

This course aims to provide both theoretical as well as practical knowledge on plumbing and wiring works. To fulfill the objectives, the teacher must involve the students in classroom activities as well as practical works. The teacher must use different methods and techniques while teaching. Some methods and techniques have been suggested below:

- Lecture
- Question answer
- Group discussion

- Field visit
- Demonstration
- Case study
- Questionnaire
- Practical works
- Audio/visual class
- Web surfing
- Project works
- Problem solving

The teachers have to take care of the following things while facilitating learning process.

- The teachers have to facilitate learning process by duly making the annual teaching plan, unit plan, and daily lesson plan as well.
- The facilitation should prefer integrating students' prior experience, concepts, status of their residence, available natural and cultural resources in the residence area, students' interest as well as religious and cultural belief. Being a practical subject, this has to deeply focus on observation, demonstration, and presentation too.
- Right after the theoretical explanation of the content, students should be facilitated with all possible relevant examples, lab practices, alongside with project works.
- Activities that hoist and enhance the understanding, reactionary views, practical skills and expression among students should be encouraged during learning facilitation. Learning should not be limited only to the gaining of knowledge.
- During learning facilitation process, there should be regular coordination with the concerned local entities to make use of locally available resources. While utilizing such sources, it is advisable to take students into the respective field and enable them observe the use and functions of such resources.
- The teachers should consider followings before adopting any of teaching methods.
 - ✓ Students' capacity and maturity to understand the subject.
 - ✓ Confidence or trust with regard to the success of the chosen teaching method.
 - ✓ Evoking interest in students for successful learning.
 - ✓ Students' readiness to think and cooperate in learning process.
 - ✓ Locally available resources and experts.

7. Students Assessment

Assessment is an important aspect of teaching learning process which will both serve the purposes of assessment for learning and assessment of learning. Both formative and summative evaluation will be carried out to measure the students' learning. Formative assessment is mainly to bring improvement in students' learning and is to be carried out on continuous basis. The following strategies are to be utilized for the formative assessment.

- Assessment of students' learning through appropriate technique like question answer, homework

- Presentation of assignments by the students
- Students' participation in discussion
- Project work completion
- Weekly, monthly and trimester tests.

Summative evaluation will be carried out through internal and external evaluation.

A. Internal Evaluation

Students' knowledge, skills and competencies will be measured through internal evaluation in both grades. The internal evaluation carries 50 percent of weightage for final evaluation. The following table shows the criterial for the internal evaluation.

S. N.	Criteria	Marks
1	Classroom participation (Daily attendance, home assignment and classwork, participation in learning, participation in other activities)	3
2	Trimester exam (3 marks from each)	6
3	Project work, report and presentation	16
Total		25
4	Practical work and viva by external examiner	25
Grand total		50

B. External Evaluation

External evaluation of the students will be based on the written examination. It carries 50% of the total weightage. The types and number of questions will be as per the test specification chart developed by the Curriculum Development Centre.

Hotel Management

Grade: 11 and 12

Subject Code: Hom. 439 (Grade 11), Hom.440 (Grade 12)

Credit Hour: 5

Annual Working hours: 160

1. Introduction

There is tremendous growth in the hotel industry in recent times, and people are also spending more money on leisure than ever before, making this sector of the industry one of the largest industries of the world. The hotel industry deals with all types of guest accommodation. The main purpose of hotels is to provide guest travelers with food, drinks, services, and shelter whilst they are away from home. To fulfill this purpose hotel industry need educated and trained individuals who can deliver first-class services.

This curriculum on hotel management equips the student with the skills and knowledge that are required for the hotel industry. The course summarizes the hospitality industry and familiarizes the students with specific reference to hotel operations. The course also helps spark the students to operate small scale operation and for further studies of hospitality management and more. The course will impart the student not only the basic knowledge and skills in the various aspects of hotel operations, but also inculcate them service culture, self-discipline, teamwork, problem-solving, communication and presentation skills.

This curriculum comprises of an Introduction to Hospitality & Tourism, Hotel, Hotel Management and Organization, Front Office Department, Housekeeping Department, Food Production Department (Kitchen), Food and Beverage (F&B) Service Department, Introduction to Event, Food science and Nutrition. The course itself is of practical nature and the pedagogical approaches in delivering the course should consider the balance between theory and practice. The same applies in case of student evaluation procedure too. The curriculum has been divided to different sections: level-wise competencies, grade-wise learning outcomes, scope and sequence of contents with their elaboration, some indication to learning facilitation process and student assessment to ensure the attainment of learning in the subject.

2. Level-wise Competencies

By the end of grade 12, the students will have the following competencies:

1. Explore possible career paths in the hospitality industry
2. Perform entry level jobs in hotel and catering establishments
3. Enable to operate and work on small-scale accommodation and catering establishments
4. Develop and proper use the forms and formats used in hotel industry
5. Demonstrate basic food and beverage service etiquettes
6. Apply basic principles of cookery in practical field
7. Operate the guest cycle procedure in hotel perfectly.

3. Grade-wise Learning Outcomes

Grade 11		Grade 12	
Content area	Learning outcomes	Content area	Learning outcomes
1. Introduction to Hotel	<p>1.1 Explain the concept and meaning of hotel and catering industry.</p> <p>1.2 Describe the history of the development of hotel and catering industry.</p> <p>1.3 Recognize the various types of catering establishments and hotel</p> <p>1.4 Explain the nature and benefits of independent, chain, franchise, management contract and referral hotel.</p>	1. Front Office Department	<p>1.1 List out the Check-In and Check-Out procedures.</p> <p>1.2 Define Front Office accounting and identify its types.</p> <p>1.3 Explain the occupancy ratios.</p> <p>1.4 Identify Visitor Tabular Ledger.</p> <p>1.5 List out the modes of payment.</p> <p>1.6 Describe the meaning and importance of Front Office correspondence.</p> <p>1.7 Identify the structure and setting of a letter.</p> <p>1.8 List out different types of correspondence.</p> <p>1.9 State the meaning and concept of hotel safety and security.</p> <p>1.10 Describe the different ways and methods of hotel safety and security.</p>
2. Hotel Management and Organization	<p>2.1 Express the meaning and concept of organization and management.</p> <p>2.2 Explain the basic concept of hotel management.</p> <p>2.3 Draw organization chart of small, medium and large hotel.</p> <p>2.4 Describe the importance of organization chart in hotel.</p> <p>2.5 Distinguish the functional and operational</p>	2. Housekeeping Department	<p>2.1 Define cleaning and explain its importance in Hotel.</p> <p>2.2 Recognize the cleaning equipment and cleaning agents.</p> <p>2.3 Identify the methods and process of cleaning furniture, metal, glasses/windows, floor, and carpets.</p> <p>2.4 Describe the bed making process.</p> <p>2.5 Point out the bathroom and room cleaning process.</p> <p>2.6 Explain the different types of room services.</p> <p>2.7 Illustrate spring cleaning.</p> <p>2.8 Define flower arrangement and explain its types.</p>

	departments of hotel.		
3. Introduction to Hospitality & Tourism	<p>3.1 Define hospitality</p> <p>3.2 Point out the service characteristics of hospitality.</p> <p>3.3 Describe the various sectors of hospitality.</p> <p>3.4 Explain the general concept of tourism and its classification.</p> <p>3.5 Define tourist and classify its types.</p> <p>3.6 Explain the history of modern tourism.</p> <p>3.7 Narrate the growth and development of modern tourism in Nepal.</p> <p>3.8 Describe n the basic components of tourism and its interrelationships</p> <p>3.9 Explain the positive and negative impacts of tourism on society, economy and environment.</p>	3. Food Production Department (Kitchen)	<p>3.1 Define cooking and explain the objectives of cooking.</p> <p>3.2 List out the rules of cooking.</p> <p>3.3 Explain the methods of cooking.</p> <p>3.4 Define Salad and explain its types.</p> <p>3.5 Define Stocks and explain its methods of preparation.</p> <p>3.6 Explain the types of soup.</p> <p>3.6 Express the meaning and importance of Sauces.</p> <p>3.7 Identify the types of mother sauce and its derivatives.</p> <p>3.8 Define and explain the uses of Accompaniment and Garnish.</p> <p>3.9 Explain the meaning and types of Sandwiches</p> <p>3.10 Describe breakfast and its types.</p>
4. Front Office Department	<p>4.1 Define front office and describe its functions.</p> <p>4.2 Draw organization chart of front office department.</p> <p>4.3 State the attributes of front office staffs.</p> <p>4.4 Describe the job description of front office staffs.</p> <p>4.5 List out the front office sections and their functions.</p> <p>4.6 Explain the guest room</p>	4. Food and Beverage Service	<p>4.1 Define Menu and point out its objectives.</p> <p>4.2 Explain the types of Menu.</p> <p>4.3 Describe the restaurant preparation process and point out the types of service.</p> <p>4.4 Define beverage and list out its classification.</p> <p>4.5 Explain the various types of beverages.</p> <p>4.6 Define tobacco and explain its types and services.</p> <p>4.7 State the concept of food and beverage controlling and explain</p>

	<p>and its types.</p> <p>4.7 Explain hotel tariff and its types and identify the bases of charging room rate.</p> <p>4.8 List out the telephone etiquettes.</p> <p>4.9 Define reservation and explain its types and procedures.</p> <p>4.10 Point out the modes and sources of reservation.</p> <p>4.11 Identify the factors affecting reservation.</p> <p>4.12 List out the different sundry services and explain their effective operating procedures.</p> <p>4.13 Explain the relationships of front office department with other departments.</p> <p>4.14 Point out the techniques of handling guest complaints.</p>		<p>its needs and objectives.</p> <p>4.8 Differentiate the Requisition, KOT/BOT</p> <p>4.9 Explain the use of billing.</p>
<p>5. Housekeeping Department</p>	<p>5.1 Define housekeeping and explain its functions.</p> <p>5.2 Draw organization chart of housekeeping department.</p> <p>5.3 Describe the layout of housekeeping sections and explain their functions.</p> <p>5.4 Illustrate the job descriptions of housekeeping staffs.</p> <p>5.5 List out the personal attributes of</p>	<p>5. Introduction to Event</p>	<p>5.1 Define events and explain its importance.</p> <p>5.2 List out the major types of events.</p> <p>5.3 Identify the basic steps of events planning.</p>

	<p>housekeeping staffs.</p> <p>5.6 Define guest room and explain its contents and supplies.</p> <p>5.7 List out the room symbols.</p> <p>5.8 Identify Maid's cart and point out the requirements for its preparation.</p> <p>5.9 Define Linens/Uniforms and explain its types.</p> <p>5.10 Explain the storage, inventory, control and Par stock.</p> <p>5.11 Define key and explain the types and control of keys.</p> <p>5.12 List out the forms and formats used by housekeeping department.</p> <p>5.13 Discuss on the different handling situation of housekeeping department.</p> <p>5.14 List out the coordinating departments of housekeeping department.</p>		
<p>6. Food Production Department (Kitchen)</p>	<p>6.1 Draw organization chart of kitchen and explain the types of kitchen.</p> <p>6.2 Recognize and listing the kitchen equipments.</p> <p>6.3 Describe the kitchen layout.</p> <p>6.4 Explain the job</p>	<p>6. Food science and Nutrition</p>	<p>6.1 Define nutrition and explain its types.</p> <p>6.2 Define balance diet and describe its need and importance.</p> <p>6.3 Define food poisoning and explain the causes of food poisoning.</p> <p>6.4 Identify the preventive measures of food poisoning.</p>

	<p>descriptions of kitchen staffs.</p> <p>6.5 List out the coordinating departments of Kitchen.</p> <p>6.6 State the meaning of hygiene and grooming and its importance in kitchen.</p> <p>6.7 Point out the personal hygiene and grooming rules. .</p> <p>6.8 Describe the different food commodities and their uses.</p>		
<p>7. Food and Beverage (F&B) Service Department</p>	<p>7.1 Describe F & B service departments and its functions.</p> <p>7.2 Draw organization chart of F & B service department and point out the job descriptions of F & B service department.</p> <p>7.3 Identify the service equipments and other service appointments</p> <p>7.4 List out the F & B outlets and their functions.</p> <p>7.5 Point out the knowledge, skill and attributes required to the F & B service staffs.</p> <p>7.6 List out the coordinating departments of F & B service department.</p>		

4. Scope and Sequence of Contents

Unit	Class 11			Class 12		
	Scope	Content	Working hrs.	Scope	Content	Working hrs.
1	Introduction to Hotel	<p>1.1 Concept and meaning of hotel and catering industry</p> <p>1.2 Historical development of hotel and catering industry</p> <p>1.3 Classification of catering establishment and hotel (on the basis of location, size, and star rating)</p> <p>1.4 Nature and benefits of independent, chain, franchise, management contract, and referral hotel</p>	10	Front Office Department	<p>1.1 Check-In and Check-Out Procedures</p> <ul style="list-style-type: none"> - Normal check-In and Check- Out - Group check-In and Check- Out <p>1.2 Front office Accountings</p> <ul style="list-style-type: none"> - Concept, meaning and types - Occupancy ratios - Visitor Tabular Ledger (meaning, posting procedure, preparing guest bill) - Modes of payment (cash, travel cheque, voucher, credit card) <p>1.3 Front office Correspondence</p> <ul style="list-style-type: none"> - Meaning and importance of correspondence - Setting a letter/ structure - Types of correspondence (Inquiries, Confirmation, Regret and Alternative, Amendment/ change, 	16

					<p>cancellation)</p> <p>1.4 Hotel Safety and Security</p> <ul style="list-style-type: none"> - Introduction - Security through information/ key handling - Suspicious people/ Skipper - Fire safety - Dealing with unusual movement 	
2	Hotel Management and Organization	<p>2.1 Meaning and concept of organization and management</p> <p>2.2 Basic concept of hotel management</p> <p>2.3 Organization chart of hotel (small, medium and large)</p> <p>2.4 Importance of organization chart in hotel</p> <p>2.5 Departments of hotel- Functional and operational departments</p>	12	Housekeeping Department	<p>2.1 Cleaning</p> <ul style="list-style-type: none"> - Needs and importance of cleaning - Classification of cleaning equipment - Classification of cleaning Agents <p>2.2 Furniture</p> <ul style="list-style-type: none"> - Cleaning equipments and agents - Cleaning procedure <p>2.3 Metal</p> <ul style="list-style-type: none"> - Identification of Metal - Cleaning equipments and agents - Cleaning process (Brass, Copper, Stainless Steel) <p>2.4 Glass/ window</p> <ul style="list-style-type: none"> - Cleaning equipments and 	16

					<ul style="list-style-type: none"> agents - Cleaning process 	
					<p>2.5 Floor</p> <ul style="list-style-type: none"> - Types of Floor (Hard floor, Soft floor, Wooden floor) - Cleaning equipments and agents - Cleaning process 	
					<p>2.6 Carpet</p> <ul style="list-style-type: none"> - Types of carpet (woolen, synthetic fiber, Nylon, synthetic/acrylic) - Cleaning equipments and agents - Cleaning process 	
					<p>2.7 Bed making process</p>	
					<p>2.8 Bathroom cleaning process</p>	
					<p>2.9 Room cleaning procedure</p> <ul style="list-style-type: none"> - Occupied room service - Departure room service - Vacant room service - Evening service/Turndown service -Second Service 	
					<p>2.10 Spring cleaning</p>	
					<p>2.11 Flower arrangement</p> <ul style="list-style-type: none"> - Introduction - Types of flower 	

					arrangements	
3	Introduction to Hospitality and Tourism	<p>3.1 Concepts and meaning of hospitality</p> <p>3.2 Service characteristics of Hospitality</p> <p>3.3 Sectors of Hospitality</p> <p>3.4 Concept and meaning of tourism</p> <p>3.5 Types of tourism</p> <p>3.6 Meaning and defining of tourist</p> <p>3.7 Types of tourists</p> <p>3.8 History of modern tourism</p> <p>3.9 Growth and development of tourism in Nepal</p> <p>3.10 Basic components of tourism- (<i>attraction, accessibility, accommodation, and amenities</i>)</p> <p>1.11 Positive and negative impacts of tourism</p>	12	Food Production Department (Kitchen)	<p>3.1 Cooking</p> <ul style="list-style-type: none"> - Aim and objective of cooking - Rules of cooking - Method of cooking (Dry heat method and Moist Heat method) <p>3.2 Salad and Dressing</p> <ul style="list-style-type: none"> - Definition and types <p>3.3 Stocks</p> <ul style="list-style-type: none"> - Definition - General method of preparation stock (White stock/ Brown stocks) <p>3.4 Soups</p> <ul style="list-style-type: none"> - Definition - Classification of soup (Thin, Thick and Multinational) <p>3.5 Sauces</p> <ul style="list-style-type: none"> - Definition - Importance of sauce - Types of mother sauce and its derivatives <p>3.6 Accompaniment and Garnish</p> <ul style="list-style-type: none"> - Definition and uses <p>3.7 Sandwiches</p> <ul style="list-style-type: none"> - Definition - Types of sandwiches 	16

					(Close sandwich, Open sandwich, Grilled sandwich) 3.8 Breakfast - Definition - Types of Breakfast (Continental, English, American, Indian)	
4	Front Office Department	4.1 Definition and functions of front office 4.2 Organization chart of front office department 4.3 Attributes of front office staffs 4.4 Job description of front office staffs 4.5 Sections within front office and their functions; - Lobby - Business center - Travel desk - Telephone operator/ Exchange - Front office cashier - Reception desk - Information desk - Bell desk - Reservation 4.6 Guest Room and its types 4.7 Hotel Tariff	12	Food and Beverage Service	4.1 Menu - Definition and Objectives - Types of menu (A' la Carte, Table d' hote) - French Classical Menu (11 courses) 4.2 Restaurant Preparation - Mise en scene - Mise en place - Cover layout (A' la Carte, Table d' hote) - Briefing - De-briefing 4.3 Types of Service 4.4 Beverage - Definition and classification of beverage - Non-alcoholic (Hot and Cold beverage) - Introduction to Alcoholic Beverage	16

		<ul style="list-style-type: none"> - Concept of tariff - Types of hotel tariff - Basis of charging room rate <p>4.8 Telephone Etiquettes</p> <p>4.9 Reservation</p> <ul style="list-style-type: none"> - Meaning and purpose of reservation - Types of reservation - Modes and sources of reservation - Factor affecting reservation - Reservation procedure <p>4.10 Sundry services</p> <ul style="list-style-type: none"> - Handling mail and message - Luggage handling - Providing information about hotel infrastructure and facilities <p>4.11 Front office coordinating departments</p> <p>4.12 Handling Guest Complain</p>			<ul style="list-style-type: none"> - Types of Alcohol Beverage <ul style="list-style-type: none"> ▪ Fermented: (Introduction and service of Beer, Wine, Cider, Perry) ▪ Distilled: (Introduction and service of Vodka, Gin, Rum, Brandy, Whisky, Tequila) ▪ Compound: (Introduction of Liqueur, Bitter) - Mixed drink (Introduction of Cocktail and Mocktail with examples) <p>4.5 Tobacco</p> <ul style="list-style-type: none"> - Definition - Types and service of tobacco <p>4.6 Food and Beverage controlling</p> <ul style="list-style-type: none"> - Needs and objectives - Requisition - KOT/BOT - Billing 	
5	Housekeeping Department	<p>5.1 Definition & functions of housekeeping</p> <p>5.2 Organization chart</p>	10	Introduction to Event	<p>5.1 Introduction</p> <p>5.2 Importance of Events</p>	6

		<p>of housekeeping department</p> <p>5.3 Layout of housekeeping sections and their functions</p> <p>5.4 Job descriptions of housekeeping staffs</p> <p>5.5 Personal attributes of housekeeping staffs</p> <p>5.6 Guest Room</p> <ul style="list-style-type: none"> - Contents and supplies - Room symbols <p>5.7 Maid's Cart & Preparation</p> <p>5.8 Linens / Uniforms</p> <ul style="list-style-type: none"> - Definition and types of linen - Storage, Inventory, control and Par stock <p>5.9 Keys</p> <ul style="list-style-type: none"> - Definition and types - Control <p>5.10 Forms and Formats</p> <ul style="list-style-type: none"> - Room report-maintenance order slip - Room check List - Lost & found - Gate pass - Log book <p>5.11 Handling situations</p>		<p>5.3 Four Major Types of Event</p> <ul style="list-style-type: none"> o Personal Event o Socio-Culture Event o Organizational Event o Leisure Event <p>5.4 Basic Event Planning Steps</p>	
--	--	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

		<ul style="list-style-type: none"> - Lost and found - Sick guest - Death guest <p>5.12 Coordinating departments of housekeeping.</p>				
6	Food Production Department (Kitchen)	<p>6.1 Introduction</p> <ul style="list-style-type: none"> - Organization chart of kitchen - Kitchen equipment (small and large) - Types of kitchen - Kitchen layout <p>6.2 Job description of kitchen staffs</p> <p>6.3 Coordinating departments of Kitchen</p> <p>6.4 Hygiene and grooming</p> <ul style="list-style-type: none"> - Personal hygiene and grooming - Kitchen hygiene/ Safety rules <p>6.5 Food commodities and their uses</p> <ul style="list-style-type: none"> - Vegetables (types and cuts) - Introduction of <ul style="list-style-type: none"> ▪ Cereals and flours ▪ Milk and milk products ▪ Fruits 	12	Food science and Nutrition	<p>6.1 Elementary Nutrition</p> <ul style="list-style-type: none"> - Definition - Types of Nutrients (protein, carbohydrates, fats, vitamins, minerals) - Functions of Nutrients <p>6.2 Balance Diet</p> <ul style="list-style-type: none"> - Definition - Needs and importance of balance diet <p>6.3 Food poisoning</p> <ul style="list-style-type: none"> - Definition - Causes of food poisoning <p>6.4 Preventive measure of food poisoning</p>	10

		<ul style="list-style-type: none"> and nuts ▪ Poultry/games ▪ Eggs ▪ Meat (lamb, mutton, pork, buff) ▪ Fish/ Sea foods ▪ Raising agents ▪ Fats and oil ▪ Spices and herbs 				
7	Food and Beverage (F&B) Service Department	<p>7.1 Introduction and functions of F&B service department</p> <p>7.2 Organization chart of F&B service department</p> <p>7.3 Job descriptions of F&B service department</p> <p>7.4 Identification of service equipments and other service appointments</p> <ul style="list-style-type: none"> - Tableware - Restaurant linens - Restaurant furniture <p>7.5 F & B outlets and their functions</p> <p>7.6 Hospitality knowledge, skill, and attributes of F&B service staffs</p>	12			

		7.7 Coordinating departments.				
	Total		80			80

Suggested Practical Activities

Practical is integral part of Secondary Education Curriculum. It focuses more on skill development than knowledge building. It consists of project work, group work, presentation, observation, internship etc. Total of 80 hours has been designated to practical activities and will be carried out under the guidance and monitoring of teacher. Following are only sample practical activities, teacher can assign any relevant practical activity as per requirement.

Unit	Class 11			Class 12		
	Scope	Content	Working hrs.	Scope	Content	Working hrs.
Introduction to Hotel		2.1 Maintain the Journal incorporating all the topics of the unit with examples of different types of hotel and submit to the class teacher. 2.2 Make a list of hotels from your area and classify them on the basis of size, location, and star rating. Submit your assignment to the teacher and interact with the friends on it. 2.3 Visit of Hotel and prepare a report of visit and present it in the class describing the strengths and weaknesses of the hotel industry. 2.4 Make a list of some of the Pioneering Hospitality	14	Front Office	1.1 Maintain the Journal of Front of department with illustration and submit it to the class teacher. 1.2 Role play of Check in and Departure Procedure 1.3 Practise using the forms and formats used in front office operation. 1.4 Draw the formats used in front office department- ✓ Registration Card ✓ Reservation Form ✓ Amendment ✓ Slip ✓ Cancellation	22

		Industry- national and international and display on chart.			<p>Slip</p> <ul style="list-style-type: none"> ✓ Arrival/depart ure notification slip ✓ VIP amenities voucher ✓ Miscellaneous charge voucher ✓ Allowance voucher ✓ Paid out voucher ✓ Message slip <p>1.5 Maintain the VTL & posting procedure</p> <p>1.6 Practice writing different correspondence used in the in hotel and maintain its collection records.</p> <p>1.7 Practise front desk grooming and other essentials – body language, speech modulation which includes articulation, variation control of pitch and tonal quality</p>	
--	--	------------------------------------------------------------	--	--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

					(to be checked by teacher) and write a reflection report.	
	Hotel as Organization	<p>3.1 Maintain the Journal showing hotel organization chart of different size of hotel and the classification of hotel operation areas and submit it to the class teacher.</p> <p>3.2 Prepare the organizational charts of standard hotel explaining interrelationship of departments within hotel in the presence of class teacher.</p>		Housekeeping Department	<p>2.1 Maintain the Journal of housekeeping department with suitable illustration and submit it to the class teacher.</p> <p>2.2 Practicing the following Cleaning Procedure</p> <ul style="list-style-type: none"> ○ Glass cleaning ○ Furniture cleaning ○ Metal cleaning ○ Bathroom ○ Bed Making process ○ Guest Room cleaning ○ Evening/ Turndown service <p>2.3 Practise the Flower Arrangement</p>	12
	Introduction to Hospitality & Tourism	<p>1.1 Maintain the Journal with suitable illustrations and pictures and submit it to the class teacher.</p> <p>1.2 Consider a tourism</p>	14	Food Production Department (Kitchen)	<p>3.1 Maintain the Journal of Production departments with its functions and responsibilities with illustrations</p>	20

		<p>activity/business in your local area and make a list of them and display on the chart.</p> <p>1.3 Make a list of the impacts under the headings: 'positive' and 'negative' and discuss with the classmate.</p> <p>1.4 Visit any tourism destination in your locality and find out the components of tourism available, and present it at the classroom.</p>			<p>and submit it to the class teacher.</p> <p>3.2 Practicing the Cookery</p> <ul style="list-style-type: none"> ○ Vegetable Cuts ○ Cooking Method (Shallow frying, deep-frying, grilling, poaching, roasting, stewing, boiling) ○ Stock (Chicken White stock, Brown stock, Fish stock) ○ Soup (Cream, Puree, Broth) ○ Mother Sauce (Béchamel, Veloute', Tomato, Espagnole, Hollandaise, Mayonnaise) ○ Soup (Cream, Puree & Broth) ○ Salad (Simple any three, Compound any three) ○ Dressing (Basic) ○ Sandwiches (Open, closed, grilled, club, Burger) ○ Varieties of 	
--	--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

					<p>Egg Preparation</p> <ul style="list-style-type: none"> ○ Main courses- any five with Accompaniment and Garnish <p>(including fish and chicken butchery)</p>	
	Front Office Department	<p>4.1 Maintain the Journal with departmental organization chart showing job hierarchy and responsibility and submit it to the class teacher.</p> <p>4.2 Sketch the Hotel front office layout.</p> <p>4.3 Draw the forms and format used in front office.</p> <p>4.4 Practise reservation procedure</p> <p>4.5 Practise of telephone handling in front desk.</p> <p>4.6 Collect printed tariffs of tourist hotels of local area and compare it and make a report.</p>	9	Food and Beverage Service	<p>4.1 Maintain the Journal incorporating various F & B services with illustration and submit it to the class teacher.</p> <p>4.2 Prepare a list of Restaurant Equipment with their use-</p> <ul style="list-style-type: none"> • Mise en Scene (preparing the environment of practical restaurant by cleaning) • Mise en Place (wiping cutleries, crockery, glassware, holloware) • Handling try • Preparing KOT /BOT & Billing • Cover layout for the practice menu • Follow the Food & 	15

					beverage service sequence	
	Housekeeping Department	<p>5.1 Maintain the Journal including all topics of the unit with illustration and submit it to the class teacher</p> <p>5.2 Prepare the Organizational Chart of Housekeeping and display on the board and compare it with other departments.</p> <p>5.3 Draw diagram showing layout of housekeeping.</p> <p>5.4 Prepare Housekeeping trolley and demonstrate it.</p> <p>5.5 Collect the pictures of equipments and tools used in housekeeping department and name them with its uses.</p> <p>5.6 Collect information of guest related problems faced by the hotels of local area.</p>	12	Back of the house operations	<p>5.1 Prepare a chart to show the hotel departments and their interrelationships.</p> <p>5.2 Display of hotel safety equipments and tools</p> <p>5.3 Mock presentation of fire safety.</p>	5
	Food Production Department (Kitchen)	<p>6.1 Maintain the Journal of kitchen department showing</p>	10	Food science and Nutrition	<p>6.1 Draw and display chart about various nutritions</p>	6

		<p>departmental chart and kitchen layout and submit it to class teacher.</p> <p>6.2 Prepare organizational Chart of Food Production department showing responsibility of its staffs.</p> <p>6.3 Draw layout of kitchen</p> <p>6.4 Collect the food commodities and herbs and classify it.</p> <p>6.5 Show the cutting methods of vegetables, poultry and fish.</p> <p>6.6 Collect the picture of kitchen equipments and list them with its uses.</p>			<p>found in different food.</p> <p>6.2 Prepare a chart showing chart of nutrition value.</p> <p>6.3 List the methods of preservation of food</p>	
	Food and Beverage Service	<p>7.1 Maintain the Journal incorporating all topics of the unit with illustration and submit it to the class teacher.</p> <p>7.2 Prepare the Organizational Chart of food and beverage department.</p> <p>7.3 Collect the picture of F&B service equipment and list them with its uses.</p> <p>7.4 Show how the F & B equipments are clean (glassware,</p>	12			

		flatware, hollowware crocery)				
	Total		80			80

Note:

- School shall arrange at least one local area visit in hotel/resort/destination in class xii focusing on Hotel Management operation and the students must prepare and submit a report of that visit for the final evaluation.

5. Learning Facilitation Process

As the curriculum aims to provide both theoretical as well as practical knowledge on hotel management, the teacher should use such teaching methods and strategies that enhance the applicable skills in the practical field. To achieve the entire objective on this subject, teacher may use the following methods, techniques and strategies:

- Discussion
- Group work and individual work
- Field Visit and report writing
- Assignments and presentation
- Demonstration
- Case study
- Questionnaire
- Practical Works
- Audio/Visual Class
- Web surfing
- Project Works
- Problem Solving.

Application of the teaching method may include one or combination of more than one methods. Facilitating learning activities in Hotel Management studies should prefer integrating students' prior experience, concepts, status of their residence, available natural and cultural resources in the residence area, students' interest as well as religious and cultural belief.

6. Students Assessment

Student assessment is to be carried out so as to ensure the learning achievement on the subject content. For this purpose, both formative and summative assessment strategies are used. The following formative assessment strategies are used for the purpose of enhancing the students' learning:

- Assessment of students' everyday learning
- Presentation of home assignments by the students
- Students' participation in discussions
- Project work completion
- Weekly, Monthly and trimester tests

With reference to summative assessment, both the internal and external evaluation will be utilized.

A. Internal Evaluation

The internal evaluation carries 50 percentage of weightage for final evaluation of student achievement. It includes students' participation, practical works and trimester exam marks. The assessment includes attendance, students' participation, group works, progress assessment and project and practical works. As a part of internal evaluation, two trimester examinations will also be conducted.

Student assessment/evaluation in this subject will be based on the examination of practical record book, field work and report writing, and viva-voce. Allocation of marks in internal assessment will be as follows:

S.N.	Criteria	Marks
1.	Classroom participation (Daily attendance, home assignments and classwork, participation in learning, participation in other activities)	3
2.	Project work/practical works, report and presentation	16
3	Trimester exams(3 marks from each trimester exam)	6
Total		25
4	Practical works and viva by external examiner	25
Grand Total		50

B. External examination

The external examination carries 50 percentage of weightage for final evaluation of student achievement. External evaluation of the students will be carried on the basis of long answer, short answer and very short answer questions covering various levels of cognitive capacities. Tools and questions for examination will be based on the specification grid developed by Curriculum Development Centre.

आमसञ्चार

कक्षा : ११ र १२

विषय सङ्केत : कक्षा ११ : Mcs. 441 (कक्षा ११), Mcs.442 (कक्षा १२)

पाठ्यघण्टा : ५

वार्षिक कार्यघण्टा : १६०

१. परिचय

आमसञ्चार र पत्रकारिता मानिसको सामाजिक व्यवहार र जीवनसँग जोडिएको विषय हो । मानिसको सामाजिक तथा वैयक्तिक जीवनका गतिविधिहरूको प्रस्तुति, सार्वजनिकीकरण, बोध, प्रयोग र सिर्जनासँग प्रत्यक्ष रूपमा सम्बन्धित रहेको यस विषयको दायरा आफैमा व्यापक रहेको छ । आमसञ्चार विषयले विभिन्न क्षेत्रका सूचना तथा सन्देशहरूलाई विविध प्रकारका सञ्चार माध्यमबाट बृहत् क्षेत्रलाई लक्षित गरी सम्प्रेषण वा प्रवाह गर्ने समग्र प्रक्रियाको अध्ययन गर्दछ । यसर्थ राष्ट्रिय पाठ्यक्रम प्रारूप, २०७६ को मार्गदर्शनबमोजिम विद्यालय शिक्षाको माध्यामिक तह (कक्षा ११ र १२) मा समावेश गरिएको आमसञ्चार र पत्रकारिताले समसामयिक मानवीय अभिरुचि र सार्वजनिक महत्वका विषयहरूमा सूचनाहरूको सङ्कलन, समाचार लेखन, सम्पादन एवम् प्रस्तुतीकरणसँग सम्बन्धित प्रक्रियाहरूको अध्ययन गर्दछ । आमसञ्चारको अवधारणा, प्रक्रिया, आमसञ्चारका माध्यम, पत्रकारिता, समाजमा यसको भूमिका, र प्रभावका बारेमा माध्यमिक तहका बालकालिकालाई ज्ञान र सिप तथा अवधारणा विकास गर्ने छ । यसका साथै यस पाठ्यक्रमले सम्बन्धित विषयमा उच्च शिक्षाको आधारसमेत तयार गर्ने छ ।

आमसञ्चार एउटा बृहत् विषय हो र पत्रकारिता आमसञ्चारभित्रको एउटा विधा हो । यसले विद्यार्थीमा सञ्चारका सैद्धान्तिक र व्यावहारिक पक्षको ज्ञान तथा सिप प्रदान गर्छ । यस पाठ्यक्रममा आमसञ्चार र पत्रकारिता विषयसम्बद्ध समाचार, संवाददाता र रिपोर्टिङ, न्यु मिडिया, अनलाइन, पत्रकारिता र सामाजिक सञ्जाल, सम्पादन र सम्पादकीय, विचार-आलेख, प्रसारण पत्रकारिता, फोटो पत्रकारिता, आमसञ्चारसम्बन्धी कानुनी र आचार संहिताजस्ता विषयवस्तु समेटिएको छ । पाठ्यक्रमले विद्यार्थीमा आमसञ्चार र पत्रकारिताका विषयवस्तु र यससँग सम्बन्धित सवालहरूबारे अध्ययन गरी समसामयिक ज्ञान तथा तिनको सचेतना प्रसारणसम्बन्धी ज्ञान हासिल गराउने उद्देश्य राखेको छ ।

परिचय, तहगत सक्षमता, कक्षाकगत सिकाइ उपलब्धि, विषयवस्तुको क्षेत्र र क्रम, सिकाइ सहजीकरण प्रक्रिया र विद्यार्थी मूल्याङ्कनलाई समेटेी यो पाठ्यक्रम विकास गरिएको हो । यस क्रममा पाठ्यक्रम लेखन तथा विकासको विषयगत औचित्य, पाठ्यक्रममा रहेका मुख्य विशेषता तथा पाठ्यक्रमको स्वरूपलाई समेटेी परिचय, विषयगत रूपमा अपेक्षित ज्ञान, सिप, अभिवृत्ति, मूल्य र कार्य तत्परतालाई समेटेी त्यसको क्रियात्मक स्वरूपमा सक्षमता, सिकाइको स्तर र सक्षमताको विशिष्टीकृत विस्तृतीकरण गरी सिकाइ उपलब्धि, सक्षमता, सिकाइ उपलब्धि एवम् अधिल्ला कक्षासँग लम्बीय सन्तुलनका आधारमा विषयवस्तुको क्षेत्र र क्रम, विषयगत विशिष्टपन र मौलिकतालाई समेटेी सिकाइ सहजीकरणका विधि तथा प्रक्रिया एवम् निर्माणात्मक र निर्णयात्मक मूल्याङ्कनका विधि तथा प्रक्रिया उल्लेख गरी विद्यार्थी मूल्याङ्कनलाई व्यवस्थित गरिएको छ ।

२. तहगत सक्षमता

माध्यमिक तह (कक्षा ११ र १२) को अध्ययनपश्चात् विद्यार्थीहरूमा आमसञ्चार र पत्रकारिताका निम्नलिखित सक्षमता हासिल हुने छन् :

१. सञ्चार र आमसञ्चारको अवधारणा, प्रकार, कार्य र महत्वको बोध तथा प्रस्तुति
२. आमसञ्चारका माध्यम, प्रक्रियाको बोध र प्रयोग तथा सञ्चार ढाँचाको अवलम्बन
३. पत्रकारिताको अवधारणा, इतिहास, सिद्धान्त र महत्वको बोध र विश्लेषण
४. पत्रकारिताका रूपहरूको बोध र विश्लेषण तथा पत्रकारिता पेसाप्रति सकारात्मक सोच विकास
५. समाचारको अवधारणा, तत्त्व र समाचारीय मूल्यको बोध र विश्लेषण

६. समाचारका प्रकार, ढाँचा र समाचार लेखनशैलीको व्यवहारिक पक्षको अवलम्बन
७. हार्ड न्युज तथा सफ्ट न्युजको रिपोर्टिङको अवधारणा र प्रक्रियाको बोध तथा संवाददाताको भूमिका पहिचान र विश्लेषण
८. अनलाइन पत्रकारिता तथा सामाजिक सञ्जालको अवधारणा र क्षेत्रको पहिचान तथा प्रयोग
९. सम्पादन र सम्पादकीयको अर्थ, प्रक्रियाको बोध र विश्लेषण तथा सम्पादकहरूको भूमिका पहिचान
१०. फोटो पत्रकारिताको अवधारणा र यसका प्राविधिक तथा सैद्धान्तिक पक्षको बोध र विश्लेषण
११. समाचार फिचरको अवधारणा र योजनाको बोध तथा प्रयोग
१२. प्रसारण पत्रकारिताको अवधारणाको बोध तथा प्रसारण प्रक्रियाको बोध र प्रयोग

३. कक्षागत सिकाइ उपलब्धि

क्र. सं.	कक्षा ११		कक्षा १२	
	क्षेत्र/एकाइ	सिकाइ उपलब्धि	क्षेत्र/एकाइ	सिकाइ उपलब्धि
१	सञ्चारका तह	१.१ सञ्चारका तह बताउन १.२ आमसञ्चारको परिचय दिन १.३ सञ्चारको प्रकार, प्रक्रिया र विशेषताको व्याख्या गर्न १.४ एरिस्टोटल र लासवेलको सञ्चार ढाँचाको वर्णन गर्न १.५ सञ्चारका माध्यमहरूको पहिचान र वर्गीकरण गर्न १.६ सञ्चार प्रक्रियाको व्याख्या गर्न	सम्पादन र सम्पादकीय	१.१ समाचार कक्षको परिचय दिन र कामहरूको सूची बनाउन १.२ सम्पादन प्रकृयाको व्याख्या गर्न १.३ सम्पादकको योग्यता, भूमिका र जिम्मेवारी पहिचान गर्न १.४ कपी एडिटर, कार्यकारी सम्पादक, समाचार सम्पादक, सम्पादक/प्रधान सम्पादकको जिम्मेवारी प्रस्तुत गर्न १.५ समाचारको पुनर्लेखन गर्न १.६ समयसीमा (डेडलाइन) को महत्व उल्लेख गर्न १.७ छापा माध्यममा प्रयोग हुने भाषा र प्रसारण माध्यममा प्रयोग हुने भाषाको भिन्नता बताउन १.८ सम्पादकीय लेखनको संरचना र तत्वको वर्णन गर्न १.९ विचार-सम्पादकीय पृष्ठ (ओपेड पृष्ठ) र स्तम्भ लेखनको परिचय दिन
२	पत्रकारिता र समाजमा यसको महत्व	२.१ पत्रकारिताको अवधारणा र परिचय प्रस्तुत गर्न २.२ नेपाली पत्रकारिताको सङ्क्षिप्त इतिहास उल्लेख गर्न २.३ छापा पत्रकारिता, प्रसारण पत्रकारिता र अनलाइन	समाचार फिचर	२.१ फिचर लेखनको परिचय प्रस्तुत गर्न २.२ फिचरको विशेषता पहिचान गर्न २.३ फिचर लेखनको योजना उल्लेख गर्न २.३ फिचरको तत्वहरू उल्लेख गर्न

		<p>पत्रकारिताको आधारभूत भिन्नता पहिचान गर्न</p> <p>२.४ पत्रकारिताको सिद्धान्तको व्याख्या गर्न</p> <p>२.५ पेनी प्रेस र पीत पत्रकारिताको अवधारणा प्रस्ट पार्न</p>		<p>२.४ फिचरका प्रकारहरू जानकारी पाउन</p> <p>२.५ अखबारमा फिचरको महत्व उल्लेख गर्न</p> <p>२.६ फिचर लेखकको बारेमा जानकारी पाउन</p> <p>२.६ फिचर र अन्य समाचारको तुलना गर्न</p>
३	समाचार	<p>३.१ समाचारको अवधारणा, प्रकार र तत्वहरूको परिचय दिन</p> <p>३.२ समाचारका स्रोतहरूको पहिचान गर्न</p> <p>३.३ समाचार लेखनको ढाँचा निर्माण र व्याख्या गर्न</p> <p>३.४ समाचार लेखनको संरचनाअनुसार समाचार लेखन</p> <p>३.५ समाचारीय मूल्यको विश्लेषण गर्न</p>	प्रसारण पत्रकारिता (रेडियो, टेलिभिजन, अनलाइन)	<p>३.१ प्रसारण पत्रकारिताको परिचय र महत्व उल्लेख गर्न</p> <p>३.२ नेपालको सन्दर्भमा रेडियो पत्रकारिता र टेलिभिजन पत्रकारिताको विकासक्रम उल्लेख गर्न</p> <p>३.३ प्रसारण पत्रकारिताका मौलिक विशेषताको सूची तयार गर्न</p> <p>३.४ रेडियो कार्यक्रम तथा टेलिभिजन कार्यक्रमका आधारभूत पक्ष/तत्वहरूको वर्णन गर्न</p> <p>३.५ रेडियो तथा टेलिभिजन कार्यक्रमको स्क्रिप्ट लेखन गर्न</p> <p>३.६ रेडियो कार्यक्रम र टेलिभिजन कार्यक्रमको ढाँचा तयार पार्न</p>
४	संवाददाता र समाचार सकलन	<p>४.१ सूचनाको अर्थ र महत्त्वबारे व्याख्या गर्न</p> <p>४.२ सम्वाददाता र रिपोर्टिङको अवधारणा उल्लेख गर्न</p> <p>४.३ सम्वाददाताको योग्यता, भूमिका र जिम्मेवारीबारे विश्लेषण गर्न</p> <p>४.४ सामान्य रिपोर्टिङ, विट रिपोर्टिङ र अनुसन्धानमूलक रिपोर्टिङबीचको भिन्नता पत्ता लगाउन</p>	फोटो पत्रकारिता (लेआउट र साजसज्जासहित)	<p>४.१ फोटो पत्रकारिता र फोटोग्राफीको परिचय दिन</p> <p>४.२ लेआउट र डिजाइनबारे बताउन</p> <p>४.३ फोटो पत्रकारिताको महत्व चर्चा गर्न</p> <p>४.४ क्यामेराको परिचय दिई त्यसका कार्यहरू बताउन</p> <p>४.५ सटरस्पिड, अपरेचर र आइएसओको सम्बन्ध बताउन</p> <p>४.६ फोटो कम्पोजिसनको महत्व र तरिका उल्लेख गर्न</p> <p>४.७ फोटोको छनोट गरी क्याप्सन लेख्न</p>
५	अनलाइन पत्रकारिता र सामाजिक सञ्जाल	<p>५.१ अनलाइन पत्रकारिताको परिचय दिन</p> <p>५.२ अनलाइनको विकास उल्लेख गर्न</p> <p>५.३ अनलाइन पत्रकारिताको विशेषताहरू उल्लेख गर्न</p>	संविधानको प्रेस तथा अभिव्यक्ति स्वतन्त्रतासम्बन्धी प्रावधान, सञ्चारसम्बन्धी कानूनका अन्तर्राष्ट्रिय मूल्य र मान्यता तथा	<p>५.१ प्रेससम्बन्धी कानून, प्रेस स्वतन्त्रता र आचार संहिताको अवधारणा र परिचय बताउन</p> <p>५.२ प्रेस स्वतन्त्रताका सम्बन्धमा नेपालको संविधान र कानूनमा भएका प्रावधानको चर्चा गर्न</p>

		<p>५.४ अनलाइन पत्रकारिताको सम्भावना र चुनौती जानकारी दिन</p> <p>५.५ अनलाइन पत्रकारिता सम्बन्धी आचारसंहिता उल्लेख गर्न</p> <p>५.६ सामाजिक सञ्जालको परिचय दिन</p> <p>५.७ पत्रकारितामा सामाजिक सञ्जालको प्रयोग उल्लेख गर्न</p> <p>५.८ सामाजिक सञ्जालको फाइदा र बेफाइदा जानकारी दिन</p> <p>५.९ अनलाइन र सामाजिक सञ्जालसँग सम्बन्धित कानुनी आधारहरूको व्याख्या गर्न</p>	आचारसंहिता	<p>५.३ गालीबिड्ज्जति, अशिललता र अदालतको अपहेलनाको सामान्य अवधारणा बताउन</p> <p>५.४ नेपाली पत्रकार र सञ्चार माध्यमका लागि जारी गरिएको पत्रकार आचार संहिता बुँदागत रूपमा उल्लेख गर्न</p>
६	प्रयोगात्मक कार्य	<p>६.१ रिपोर्टिङको प्रक्रियाअनुरूप समाचारका लागि सूचना सङ्कलन गर्न</p> <p>६.२ तोकिएको ढाँचामा समाचार लेख्न</p> <p>६.३ अखबारमा प्रकाशन भएको कम्तीमा तीन प्रकारको शीर्षक, आमुख, बिटका समाचार, सम्पादकीय र हार्ड र सफ्ट न्युज पत्ता लगाउन</p> <p>६.२ समूहमा भित्ते पत्रिका प्रकाशन गर्न</p>	प्रयोगात्मक कार्य	<p>६.१ हरेक विद्यार्थीलाई ठाउँ र व्यक्तिको फिचर लेख्न, अखबारमा छापिएका कम्तीमा तीन ओटा फिचर पत्ता लगाउन लगाएर पेपरमा टास्न लगाउन</p> <p>६.२ रेडियो र टिभीका लागि कार्यक्रमको खाका तयार गर्न, स्कूल म्यागजिनको नमुना खाका बनाउन, अखबारमा कम्तीमा तीनओटा स्तम्भ पत्ता लगाउन</p> <p>६.३ हरेक विद्यार्थीले आठ पृष्ठको कुनै एउटा पत्रिका (ब्रोडसिट वा ट्याबल्व्वाइड) जस्ताको जस्तै उत्तार्न</p>

४. विषयवस्तुको क्षेत्र र क्रम

कक्षा: ११

क्र.सं.	विषय क्षेत्र	विषयवस्तु	विषय क्षेत्र	विषयवस्तु	पाठ्यघण्टा
१	आमसञ्चारको परिचय	<p>१.१ सञ्चारको अर्थ र परिभाषा</p> <p>१.२ सञ्चारको तह र प्रकार</p> <p>१.३ आमसञ्चारको परिचय</p> <p>१.४ आमसञ्चार प्रक्रिया</p> <p>१.५ सञ्चार ढाँचा (लिनियर र ननलिनियर)</p> <p>१.६ एरिस्टोटल र लासवेलको सञ्चार अवधारणा</p>	सम्पादन र सम्पादकीय	<p>१.१ समाचार सम्पादनको परिचय र महत्त्व</p> <p>१.२ समाचार कक्षको संरचनात्मक स्वरूप</p> <p>१.३ सम्पादकको परिचय, योग्यता, भूमिका र जिम्मेवारी : कपी एडिटर, समाचार सम्पादक, सम्पादक/ प्रधान सम्पादक</p> <p>१.४ समाचार सम्पादन प्रक्रिया</p>	२८

		<p>१.७ सञ्चारका अवरोधहरू</p> <p>१.८ आमसञ्चारका माध्यम र तिनका कार्यहरू</p> <p>१.९ आमसञ्चार माध्यमका प्रकारहरू</p>		<p>१.५ डेडलाइनको दवाव र पुनर्लेखन</p> <p>१.६ सम्पादकीय लेखनको परिचय, महत्व र संरचना</p> <p>१.७ विचार-आलेख (ओपिनियन आर्टिकल) लेखक र स्तम्भकार</p> <p>१.८ पृष्ठ संयोजनको परिचय, साजसज्जाको सिद्धान्त, तत्व</p>	
२	पत्रकारिता	<p>२.१ पत्रकारिताको अर्थ र परिभाषा</p> <p>२.२ नेपाली छाप पत्रकारिताको सङ्क्षिप्त इतिहास</p> <p>२.३ पत्रकारिताका सिद्धान्तहरू</p> <p>२.४ पत्रकारिताको महत्व</p> <p>२.५ पत्रकारिताका प्रकारहरू</p> <p>२.६ पत्रकारिताका प्रकृया</p> <p>२.७ पत्रकारिताका केही आयाम</p> <p>२.७.१ अनुसन्धानमूलक पत्रकारिता</p> <p>२.७.२ आर्थिक पत्रकारिता</p> <p>२.७.३ विकास पत्रकारिता</p> <p>२.७.४ वातावरण पत्रकारिता</p> <p>२.८ पेनी प्रेस र पीत पत्रकारिता</p>	समाचार फिचर	<p>२.१ फिचर लेखनको परिचय</p> <p>२.२ फिचरको विशेषता</p> <p>२.३ फिचर लेखनको योजना</p> <p>२.३ फिचरको तत्वहरू</p> <p>२.४ फिचरका प्रकार</p> <p>२.५ फिचरको महत्व</p> <p>२.६ फिचर लेखक</p> <p>२.६ फिचर र अन्य समाचारको तुलना</p>	२०
३	समाचार	<p>३.१ समाचारको अवधारणा र परिभाषा</p> <p>३.२ समाचारका प्रकार</p> <p>३.२.१ हार्ड न्युज (इभेन्ट रिपोर्टिङ)</p> <p>३.२.२ स्रुट न्युज (सिचुएसन अर इस्युरिपोर्टिङ/न्युज-फिचरसहित)</p> <p>३.३ समाचारका स्रोतहरू</p> <p>३.४ समाचारका तत्वहरू</p> <p>३.५ समाचार लेखनमा ६ क (5W1H)</p> <p>३.६ समाचारीय मूल्य</p> <p>३.७ समाचारको</p>	प्रसारण पत्रकारिता	<p>३.१ नेपालमा रेडियो र टेलिभिजनको विकास</p> <p>३.२ रेडियो तथा टेलिभिजन प्रसारणका विशेषताहरू</p> <p>३.३ रेडियो तथा टेलिभिजन कार्यक्रमको परिचय</p> <p>३.४ रेडियो समाचार बुलेटिन</p> <p>३.५ रेडियो म्यागेजिन, डकुमेन्ट्री र रेडियो फिचर</p> <p>३.६ लाइभ कार्यक्रम र रेकर्डिङ</p> <p>३.७ रेडियो र टेलिभिजनका लागि स्क्रिप्ट लेखन</p> <p>३.८ नेपालमा रेडियोको महत्व</p>	२४

		<p>संरचना/ढाँचा</p> <p>३.७.१ हेडलाइन</p> <p>३.७.२ बाइलाइन</p> <p>३.७.३ डेटलाइन</p> <p>३.७.४ लिड</p> <p>३.७.५ मुख्य भाग</p> <p>३.७.६ पृष्ठभूमि</p> <p>३.७.७ क्रेडिट लाइन</p> <p>३.८ समाचार लेखन शैली</p> <p>३.९ समाचार लेखनको भाषा र प्रस्तुति</p>			
४	संवाददाता र समाचार संकलन	<p>४.१ पत्रकारितामा रिपोर्टिङको अर्थ परिभाषा र महत्त्व</p> <p>४.२ सूचनाको अवधारणा र महत्त्व</p> <p>४.३ सूचनाको उपयोग</p> <p>४.४ समाचारका लागि सूचना सङ्कलन प्रक्रिया</p> <p>४.५ संवाददाता र पत्रकार</p> <p>४.६ संवाददाताका योग्यता र सिप</p> <p>४.७ संवाददाताको भूमिका र जिम्मेवारी</p> <p>४.८ सामान्य रिपोर्टिङ र विषयगत रिपोर्टिङ</p> <p>४.९ गहन रिपोर्टिङ र अनुसन्धानमूलक रिपोर्टिङ</p>	फोटो पत्रकारिता	<p>४.१ फोटो पत्रकारिता र फोटोग्राफीको परिचय</p> <p>४.२ नेपालमा फोटो पत्रकारिताको सङ्क्षिप्त इतिहास</p> <p>४.३ फोटो पत्रकारिताको महत्त्व</p> <p>४.४ सटरस्पिड, अपरेचर र आइएसओ</p> <p>४.५ फोटो कम्पोजिसनको आधारभूत नियम</p> <p>४.६ क्यामेरा र लेन्स</p> <p>४.७ क्यामेरा सञ्चालन गर्ने कला</p> <p>४.८ तस्बिर छनोट र क्याप्सन लेखन</p>	२४
५	अनलाइन पत्रकारिता र सामाजिक सञ्जाल	<p>५.१ अनलाइन पत्रकारिताको परिचय</p> <p>५.२ अनलाइनको विकास</p> <p>५.३ अनलाइन पत्रकारिताको विशेषताहरू</p> <p>५.४ अनलाइन पत्रकारिताको सम्भावना र चुनौती</p> <p>५.५ अनलाइन पत्रकारितासम्बन्धी</p>	प्रेससम्बन्धी कानून र पत्रकार आचारसंहिता	<p>५.१ प्रेस स्वतन्त्रताको अवधारणा, नेपालमा प्रेस स्वतन्त्रताको संवैधानिक प्रावधान</p> <p>५.२ नेपालका प्रेस कानूनहरूको सङ्क्षिप्त परिचय : (नेपालको संविधान, मुलुकी अपराध संहिता २०७४ मा प्रेस संग सम्बन्धित दफा, छापाखाना र प्रकाशन सम्बन्धी ऐन २०४८, राष्ट्रिय प्रसारण ऐन २०४८, श्रमजीवी पत्रकारसम्बन्धी ऐन २०६४, सूचनाको हकसम्बन्धी ऐन २०६४)</p>	२४

		<p>आचारसंहिता</p> <p>५.६ सामाजिक सञ्जालको परिचय</p> <p>५.७ पत्रकारितामा सामाजिक सञ्जालको प्रयोग</p> <p>५.८ सामाजिक सञ्जालको फाइदा र बेफाइदा</p> <p>५.९ अनलाइन र सामाजिक सञ्जालसँग सम्बन्धित कानुनी व्यवस्था</p>		<p>५.३ सूचनाको हक</p> <p>५.४ गाली बेइज्जती र अश्लीलताको परिचय</p> <p>५.५ अदालतको अपहेलना</p> <p>५.६ प्रेस काउन्सिलको अवधारणा</p> <p>५.७ नेपालमा पत्रकार आचारसंहिता</p> <p>५.८ आचारसंहिता र कानूनको फरक</p>	
६	प्रयोगात्मक कार्य	<p>६.१ अखबारमा प्रकाशन भएको कम्तीमा तीन प्रकारको शीर्षक, आमुख, बीटका समाचार, सम्पादकीय र हार्ड र सफ्ट न्युज पत्ता लगाएर टास्न लगाउने</p> <p>६.२ समूहमा भित्ते पत्रिका प्रकाशन</p>	प्रयोगात्मक कार्य	<p>६.१ हरेक विद्यार्थीलाई ठाउँ र व्यक्तिको फिचर लेख्न, अखबारमा छापिएका कम्तीमा तीनओटा फिचर पत्ता लगाउन लगाएर पेपरमा टास्न लगाउने</p> <p>६.२ रेडियो र टिभीको लागि कार्यक्रमको खाका तयार गर्न लगाउने, स्कुल म्यागजिनको नमुना खाका बनाउने, अखबारमा कम्तीमा तीन ओटा स्तम्भ पत्ता लगाएर पेपरमा टाँस्ने,</p> <p>६.३ हरेक विद्यार्थीले आठ पृष्ठको कुनै एउटा पत्रिका (ब्रोडसिट वा ट्याबल्वाइड) जस्ताको जस्तै उतारेर लेआउटको अभ्यास गर्ने</p>	४०
जम्मा					१६०

५. प्रयोगात्मक तथा परियोजना कार्य

कक्षा ११ र १२ मा प्रयोगात्मक कार्यअन्तर्गत सञ्चालन गर्न सकिने केही सम्भाव्य क्रियाकलापहरू निम्नअनुसार छन् :

क्र.सं.	कक्षा ११			कक्षा १२		
	विषयक्षेत्र	प्रयोगात्मक कार्य विवरण	पाठ्य घण्टा	विषयक्षेत्र	प्रयोगात्मक कार्य विवरण	पाठ्य घण्टा
१	आमसञ्चारको परिचय	<p>१. शिक्षकको सहयोगमा शाब्दिक र गैरशाब्दिक सञ्चारबीचको अन्तर पत्ता लगाउने</p> <p>२. सञ्चार र आमसञ्चारसम्बन्धी तथ्यहरू सङ्कलन गरी कक्षामा प्रस्तुत गर्ने र छलफलबाट आएको निष्कर्षलाई समष्टिगत</p>	१०	१. सम्पादन र सम्पादकीय	<p>१. कुनै विषयमा समाचार लेखी अर्को साथीबाट सम्पादन गराई पक्षामा प्रस्तुत गर्ने</p> <p>२. अखबारमा प्रकाशित समाचारलाई रेडियोमा वाचन गर्न मिल्ने</p>	८

		रूपमा सम्पादन गरी सबै विद्यार्थीहरूलाई वितरण गर्ने ३. आमसञ्चारका अवरोधहरूको सूची तयार पारी कक्षामा प्रस्तुत गर्ने			भाषामा लेखी वाचन गर्ने ३. १६ पृष्ठको समाचारपत्रको लेआउट तयार पारी कक्षामा प्रस्तुत गर्ने	
२	पत्रकारिता	१. विभिन्न प्रकारका समाचारमूलक पत्रिका र म्यागेजिनहरू सङ्कलन गरी तिनीहरूको तुलना गर्ने २. स्थानीय स्तरमा भएका रेडियो, टेलिभिजन स्टेसन, अनलाइन पोर्ट तथा प्रेसका कार्यालयहरूको भ्रमण गरी उनीहरूले काम गर्ने तरिका, कार्यालयको प्रकृतिका बारेमा अध्ययन, अवलोकन गरेर तीमध्येको कुनै एकको बारेमा प्रोफाइल तयार पार्ने	५	२. विचार-आलेख .ओपिनियन आर्टिकल)	१. विद्यार्थीहरूलाई विभिन्न पत्रिकाहरूमा प्रकाशित भएका विचार-आलेख (ओपिनियन आर्टिकल)हरू र समाचार सङ्कलन गरी विचार-आलेख र समाचारबीचका फरकहरू छुट्याउने २. विचार-आलेख (ओपिनियन-आर्टिकल) का लागि स्थानीय स्तरमा भएका विभिन्न विषय छनोट गर्ने र विचार-आलेख (ओपिनियन आर्टिकल) को योजना बनाई तयार पार्ने	७
	३. समाचार	१. विभिन्न पत्रिका र म्यागेजिनमा प्रकाशित समाचारहरू सङ्कलन गरी समाचारका तत्वहरू छुट्याएर कक्षामा प्रस्तुत गर्ने २. पत्रिकामा छापिएका समाचारमध्ये पाँचपाँचओटा हाड न्युज र सृट न्युज छुट्याउने ३. अूनो समुदायमा भएका समाचार बनाउन मिल्ने विषयवस्तु अवलोकन गरी कुनै तीन विषयमा समाचार लेख्ने र कक्षामा छलफल गर्ने	१०	३. प्रसारण पत्रकारिता	१. स्थानीय स्तरमा रहेको एफएम रेडियो सुन्ने र रेडियोले प्रस्तुत गरेका विषयवस्तुको सूची बनाई कक्षामा प्रस्तुत २. कुनै विषयमा १५ मिनेटको रेडियो स्क्रिप्ट तयार पार्ने	८
	४.संवाददाता र रिपोर्टिङ	स्थानीय स्तरमा भइरहेको कुनै कार्यक्रममा सहभागी भई त्यसको आधारमा समाचार तयार पार्ने	५	४. फोटो पत्रकारिता	१. फोटोको महत्व र फाइदाका बारेमा निबन्ध लेखी कक्षामा प्रस्तुत गर्ने २. फोटोको सिद्धान्तमा आधारित भएर पत्रिकामा छापिएका फोटो सङ्कलन गर्ने ३. कुनै सन्देशमूलक फोटो खिचेर त्यसका क्याप्सनसहित कक्षामा	९

					प्रस्तुत गर्ने	
	५. न्युमिडिया, अनलाइन पत्रकारिता र सामाजिक सञ्जाल	१. कुनै एक न्युज पोर्टलको अवलोकन गरी अन्य मिडिया (रेडियो, टेलिभिजन, पत्रिका) सँग तुलना गरेर यसका उपयोगिताका सूची बनाई कक्षामा प्रस्तुत गर्ने २. कुनै एक चर्चित घटनाका बारेमा अन्य मिडियामा आएको समाचार र अनलाइनमा आएको समाचारको बीचमा अध्ययन गरी फरक पत्ता लगाई कक्षामा प्रस्तुत गर्ने	१०	५. सञ्चार सम्बन्धी कानून र आचारसंहिता	१. प्रेस कानून र पत्रकार आचार संहिताका भिन्नताका बारेमा सूची तयार पारी कक्षामा प्रस्तुत गर्ने २. नेपालको संविधानले प्रेस स्वतन्त्रताका लागि गरेका व्यवस्था खोजी कक्षामा प्रस्तुत गर्ने ३. नेपालका वर्तमान प्रेस कानूनहरूको नामको सूची लेखी कक्षामा प्रस्तुत गर्ने	११
जम्मा			४०	जम्मा		४०

६. सिकाइ सहजीकरण विधि तथा प्रक्रिया

आमसञ्चार तथा पत्रकारिता विषय मानिसको सामाजिक र वैयक्तिक जीवनसँग प्रत्यक्ष रूपमा जोडिएको विषय भएकाले यो विषयले एकातिर सूचनाहरूको सङ्कलन, प्रशोधन, प्रकाशन, प्रसारण र प्रस्तुतीकरणजस्ता क्रियाकलापहरूको बारेमा सैद्धान्तिक ज्ञान प्रवाह गर्दछ भने अर्कोतिर उल्लिखित प्रक्रियाअनुरूप सन्देशहरूको उत्पादन र प्रवाहीकरण गर्ने प्रयोगात्मक सिप प्रदान गर्ने गर्दछ । आमसञ्चारका आधुनिक माध्यम मिडियाको प्रकृति र तिनीहरूको भूमिकाको सैद्धान्तिक र प्रयोगात्मक अवधारणा, ज्ञान र सिप प्रदान गर्न कुनै एउटा मात्र शिक्षण विधिले पूर्ण हुन सक्दैन । आवश्यकताअनुसार विभिन्न प्रकारका शिक्षण विधिहरूलाई प्रयोग गरेर अध्यापन कार्यलाई प्रभावकारी बनाउनुपर्ने हुन्छ । यस क्रममा सैद्धान्तिक पक्षको लागि व्याख्यान, प्रश्नोत्तर, समस्या समाधान, प्रदर्शनजस्ता शिक्षण विधिहरू उपयुक्त हुन्छन् भने व्यावहारिक पक्षको लागि अवलोकन, सामूहिक छलफल, प्रदर्शन, स्थलगत अध्ययन, परियोजना कार्य विधि जस्ता शिक्षण विधिहरू सान्दर्भिक हुन्छन् । समाचारका प्रकार, स्रोत र तत्वहरूलाई सिकाउन अखबार नै प्रदर्शन गर्नुपर्ने हुन्छ । मिडियाले कसरी काम गर्छ भनेर स्पष्ट पार्नका लागि विभिन्न प्रकारका मिडियाका प्राविधिक उपकरणहरूलाई देखाउनुपर्ने हुन्छ । यसै गरी फोटोपत्रकारिताको लागि स्थलगत कार्य नै गर्नुपर्ने हुन्छ । यो विषयमा प्रयोगात्मक कार्य बढी हुने भएकाले आवश्यकताअनुसार विभिन्न प्रकारका शिक्षण विधिहरू अपनाउनुपर्ने हुन्छ । आमसञ्चार तथा पत्रकारिता विषयको प्रभावकारी अध्यापनका लागि तल उल्लेख गरिएका विभिन्न विधिहरू अपनाउन सकिन्छ । व्याख्यान, प्रदर्शन जस्ता शिक्षककेन्द्रित र परियोजना कार्य, दस्तावेज अध्ययन, छलफल, समस्या समाधान, स्वअध्ययन र स्थलगत अध्ययन जस्ता विद्यार्थीकेन्द्रित विधिको प्रयोगलाई बढीभन्दा बढी प्रयोग गरी यो विषयमा सिकाइ सहजीकरण गर्न सकिन्छ । यसका विशिष्ट शैक्षणिक प्रविधि निम्नानुसार हुन सक्छन् :

एकाइ	शैक्षणिक प्रविधि
१	<p>आमसञ्चारको परिचय</p> <p>१. विद्यार्थीलाई सञ्चार र आमसञ्चारको अवधारणा तथा मानवीय तथा सामाजिक व्यवहारमा यसको महत्त्वबारे तथ्य सङ्कलन गर्न लगाई समूहगत रूपमा छलफल गराउने । छलफलबाट आएको निष्कर्षलाई समष्टिगत रूपमा सम्पादन गरी सबै विद्यार्थीहरूलाई वितरण गर्न लगाउने</p> <p>२. आमसञ्चारका अवरोध, यसका प्रकार र सञ्चार ढाँचाको बारेमा बुँदाहरू टिपोट गरी समूहमा छलफल गराई प्रस्तुत गर्न लगाउने</p>

२	<p>पत्रकारिता</p> <ol style="list-style-type: none"> विभिन्न प्रकारका समाचारमूलक पत्रिका र म्यागजिनहरू सङ्कलन गरी तिनीहरूको तुलना गर्न लगाउने स्थानीय ठाउँमा भएका रेडियो, टेलिभिजन स्टेसन वा अनलाइन पोर्टलको सूची तयार गरी कुनै प्रोफाइल लेखन लगाउने
३	<p>समाचार</p> <ol style="list-style-type: none"> विभिन्न प्रकारका पत्रिका र म्यागजिनमा प्रकाशित समाचारहरू सङ्कलन गरी समाचारका तत्वहरू छुट्टाउन लगाउने र समूहगत रूपमा छलफल गराउने प्रत्येक विद्यार्थीहरूलाई समाचार लेखन लगाई कक्षामा प्रस्तुत गर्न लगाउने
४	<p>संवाददाता र रिपोर्टिङ</p> <ol style="list-style-type: none"> सूचना र रिपोर्टिङ तथा त्यसको प्रकृतिबारे अवधारणा पत्ता लगाउने सूचनाको महत्त्व, संवाददाताको भूमिका र विभिन्न प्रकारका रिपोर्टिङको महत्त्वलाई सूचीबद्ध गरी कक्षामा छलफल गर्न लगाउने
५	<p>नयाँ माध्यम, अनलाइन पत्रकारिता र सामाजिक माध्यम</p> <ol style="list-style-type: none"> नयाँ माध्यम, अनलाइन पत्रकारिता र सामाजिक माध्यमको अवधारणा र यसका विविध पक्षबारे सूची बनाउन लगाउने सामाजिक सञ्जालका प्रयोग र उपयोगिताका सूची बनाई फरक फरक समूहमा कक्षामा छलफल गर्न लगाउने नयाँ माध्यमसँग र सामाजिक माध्यमसँग सम्बन्धित कानुनी पक्षहरूको सूची तयार गर्न लगाउने
६	<p>सम्पादन र सम्पादकको भूमिका</p> <ol style="list-style-type: none"> विद्यार्थीहरूलाई सम्पादन र सम्पादकीयको अवधारणाबारे बुँदागत रूपमा सूची तयार गरी कक्षामा छलफल गर्न लगाउने समाचारपत्रको लेआउट तयार गरी कक्षामा प्रस्तुत गर्न लगाउने
७	<p>विचार-आलेख (ओपिनियन-आर्टिकल)</p> <ol style="list-style-type: none"> विद्यार्थीहरूलाई विभिन्न अखवारहरूमा प्रकाशित भएका विचार-आलेख (ओपिनियन -आर्टिकल) हरू सङ्कलन गरी कक्षामा देखाउन लगाउने ठोस योजनासहित विचार-आलेख (ओपिनियन-आर्टिकल) तयार पार्न लगाउने
८	<p>प्रसारण पत्रकारिता</p> <ol style="list-style-type: none"> विद्यार्थीहरूलाई कक्षामा प्रसारण पत्रकारिताको मुख्य अवधारणा भन्न लगाउने, नेपालको सन्दर्भमा रेडियो र टेलिभिजन प्रसारणको इतिहास लेखन लगाउने र प्रसारण पत्रकारिताको महत्त्वको सूची बनाई कक्षामा प्रस्तुत गर्न लगाउने प्रसारण संस्थाहरूका बारेमा लेखन लगाई कक्षामा प्रस्तुत गर्न लगाउने

९	<p>फोटो पत्रकारिता</p> <p>१. फोटो पत्रकारिताका विविध सैद्धान्तिक पक्ष र फोटो खिच्ने तरिकाहरूका बारेमा तथ्यहरू सङ्कलन गर्न लगाउने</p> <p>२. पत्रपत्रिकामा प्रकाशित विभिन्न प्रकारका फोटाहरू सङ्कलन गरी कक्षामा प्रस्तुत गर्न लगाउने</p> <p>३. प्रत्येक विद्यार्थीहरूलाई आफैँ फोटो खिच्न लगाई कक्षामा प्रदर्शन गर्न लगाउने</p>
१०	<p>सञ्चारसम्बन्धी कानून र आचारसंहिता</p> <p>१. प्रेस कानून र पत्रकार आचारसंहिताबीच रहेको अवधारणागत भिन्नताहरूको सूची तयार गरी कक्षाका भन्न लगाउने</p> <p>२. प्रेस स्वतन्त्रतासम्बन्धीको संवैधानिक व्यवस्थाका बारेमा बुँदा टिपोट गर्न लगाउने र नेपालका वर्तमान प्रेस कानूनहरूको नामको सूची लेखन लगाउने तथा पत्रकार आचारसंहिताका प्रमुख बुँदाहरूलाई टिपोट गरी फरक फरक समूहमा कक्षामा प्रस्तुत गर्ने</p>

७. विद्यार्थी मूल्याङ्कन

विद्यार्थीको सिकाइ उपलब्धि सुनिश्चित गर्न निर्माणात्मक र निर्णयात्मक दुवै प्रकारको मूल्याङ्कन गर्नुपर्ने छ । विद्यार्थीको सिकाइ उपलब्धि सुधारका लागि कक्षा शिक्षणकै क्रममा कक्षाकार्य, परियोजना कार्य, प्रस्तुतीकरण, उपलब्धि परीक्षा जस्ता क्रियाकलाप गराई सैद्धान्तिक तथा प्रयोगात्मक ज्ञान तथा सिप हासिल गराउन आवश्यक छ । यसको प्रभावकारी रूपमा कार्यान्वयन तथा विद्यार्थीको सिकाइ स्तर सुधार गर्न सिकाइ सहजीकरण क्रियाकलापको अभिन्न अङ्गका रूपमा निर्माणात्मक मूल्याङ्कनलाई उपयोग गर्नुपर्छ । निर्माणात्मक मूल्याङ्कनको सिकाइ उपलब्धिको निश्चित भारलाई निर्णयात्मक मूल्याङ्कनमा समेत जोडिने छ ।

(क) आन्तरिक मूल्याङ्कन

आन्तरिक तथा प्रयोगात्मक मूल्याङ्कनका लागि प्रत्येक विद्यार्थीहरूको फाइल बनाई उनीहरूले गरेका कार्य र उनीहरूमा आएको व्यवहार परिवर्तनको अभिलेख राखी सोका आधारमा अङ्क प्रदान गर्नुपर्दछ । विद्यार्थीहरूले के कति सिके भन्ने कुरा पत्ता लगाई नसिकेको भए कारण पहिचान गरी पुनः सिकाइन्छ भने यस्तो मूल्याङ्कन प्रक्रियालाई निर्माणात्मक मूल्याङ्कन भनिन्छ । कक्षा ११ र १२ को आमसञ्चार तथा पत्रकारिता विषय सिकाइको क्रममा कक्षाकोठामा कक्षागत शिक्षण सिकाइकै अभिन्न अङ्गका रूपमा गृहकार्य, कक्षाकार्य, परियोजना कार्य, सामुदायिक कार्य, सह/अतिरिक्त क्रियाकलाप, एकाइ परीक्षा, मासिक परीक्षा जस्ता मूल्याङ्कनका साधनहरूको प्रयोग गर्न सकिने छ र मूल्याङ्कनका लागि विद्यार्थीको अभिलेख राख्नुपर्छ । सोको आधारमा नै सिकाइ अवस्था यकिन गरिन्छ र आवश्यकतानुसार उपचारात्मक शिक्षण सिकाइ क्रियाकलाप सञ्चालन गर्नुपर्छ । विशेष सिकाइ आवश्यकता भएका विद्यार्थीका लागि विषय शिक्षकले नै उपयुक्त प्रक्रिया अपनाई मूल्याङ्कन गर्नुपर्ने छ । शिक्षकले यस प्रकारको मूल्याङ्कन निरन्तर रूपमा गरी विद्यार्थीहरूमा अपेक्षित सिप र व्यवहार विकासमा जोड दिनु पर्दछ ।

यस विषयमा कक्षा ११ र १२ मा कुल भारमध्ये २५ प्रतिशत भार आन्तरिक मूल्याङ्कनमाफर्त हुने छ । यसको मूल्याङ्कन निम्नअनुसार हुने छ :

कक्षा ११ र १२ का लागि आन्तरिक मूल्याङ्कन मापदण्ड

क्र स	आधार	अंक	कैफियत
१	कक्षा सहभागिता	३	
२	कक्षा परीक्षा	६	

३	आमसञ्चारसम्बन्धी परियोजना कार्यको मूल्याङ्कन		
३.१	परियोजना कार्यको प्रतिवेदनको तयारी (कम्तिमा पाँचओटा)	१०	
३.२	परियोजना कार्यको प्रस्तुतीकरण (कम्तीमा तीनओटा)	६	
जम्मा		२५	

(ख) बाह्य मूल्याङ्कन

यस विषयमा कक्षा ११ र १२ प्रत्येकमा कुल भारमध्ये ७५ प्रतिशत भार बाह्य मूल्याङ्कन हुने छ । कक्षा ११ र १२ प्रत्येक कक्षामा लागि लिइने परीक्षाका लागि पाठ्यक्रम विकास केन्द्रले तयार गरेको विशिष्टीकरण तालिकाअनुसार प्रश्नपत्र निर्माण गर्नुपर्ने छ । यस विषयको परीक्षामा विशेष गरेर ज्ञान/बोध, समस्या समाधान, समालोचनात्मक, सिर्जनासँग सम्बन्धित प्रश्नहरू सोधिने छन् । पाठ्यक्रमले निर्धारण गरेका उद्देश्यअनुरूप विद्यार्थीहरूले ज्ञान, सिप, अभिवृत्ति प्राप्त गरे नगरेको मूल्याङ्कन गरिन्छ । सबै बाह्य परीक्षामा अक्षराङ्कन पद्धतिको प्रयोग गरिने छ ।