

पाठ्यांश शीर्षक : साधारण नेपाली -२

पाठ्यांश सङ्केत : नेपा. शि. ४२१

तह : बि.एड.

सेमेस्टर : दोस्रो

पाठ्यांश प्रकृति : सैद्धान्तिक

क्रेडिट आवर : ३

शिक्षण घण्टा: ४८

१. पाठ्यांशको परिचय

यस पाठ्यांशले नेपाली भाषामा विशिष्ट बोध, अभिव्यक्ति र रचना कौशलको विकास गर्ने लक्ष्य राखेको छ । यो पाठ्यांश जम्मा पाँच एकाइमा विभाजित छ । पहिलो एकाइमा वाक्यतन्त्र, वाक्यान्तरण र संसक्ति; दोस्रो एकाइमा सूचना र तथ्यको रूपान्तर; तेस्रो एकाइमा प्रयोजनपरक बोध; चौथो एकाइमा लिखित अभिव्यक्ति र पाँचौं एकाइमा साहित्यिक कृतिको पठन, आस्वादन र प्रतिक्रियात्मक लेखन जस्ता विषयवस्तुहरू समावेश गरिएका छन् । त्यसैले यसमा वाक्यतन्त्र, वाक्यान्तरण र संसक्ति, सूचना र तथ्यको रूपान्तर, प्रयोजनपरक बोध तथा विभिन्न प्रकारका लिखित अभिव्यक्तिका साथै निर्धारित साहित्यिक कृतिहरूको पठन, आस्वादन र अभिव्यक्ति क्षमताको विकास गराउने अपेक्षा राखिएको छ ।

२. साधारण उद्देश्यहरू

यस पाठ्यांशका साधारण उद्देश्यहरू निम्नानुसार रहेका छन् :

- निर्धारित वाक्यतन्त्रका आधारमा स्वतन्त्र र निर्देशित रचना लेख्न सक्षम तुल्याउने,
- शब्दहरूका व्याकरणिक र कोशीय संसक्ति तथा अन्तर्वाक्यात्मक अन्विति पत्ता लगाउन प्रोत्साहित गराउने,
- अनुच्छेदका सूचना/तथ्यलाई तालिका र चित्राकृतिमा रूपान्तर गर्न सबल बनाउने,
- निर्धारित गद्यांशबाट प्रयोजनपरक बोध प्रश्नको उत्तर लेखनको अभ्यासमा दक्ष तुल्याउने,
- विभिन्न प्रकारका लिखित अभिव्यक्ति सिर्जनामा सक्रियता बढाउने,
- निर्दिष्ट साहित्यिक विधाको सरसरती पठन, आस्वादन र प्रतिक्रिया लेखनको अभ्यास गराउने ।

३. विशिष्ट उद्देश्य र पाठ्यवस्तु

विशिष्ट उद्देश्य	पाठ्यवस्तु
<ul style="list-style-type: none"> ● वाक्यतन्त्र अनुरूप वर्णनात्मक प्रकृतिका स्वतन्त्र अनुच्छेद रचना गर्न, ● निर्देशित वाक्यतन्त्र अनुरूप वाक्यान्तरण गर्न, ● निर्देशित संरचनाअनुसार वाक्य संश्लेषण र विश्लेषण गर्न, ● शब्दहरूका व्याकरणिक र कोशीय संसक्ति पहिल्याउन, ● अन्तर्वाक्यात्मक अर्थान्विति पत्ता लगाउन । 	एकाइ एक : वाक्यतन्त्र, वाक्यान्तरण र संसक्ति (१२) १.१ काल, पक्ष, भाव, वाच्य र करणका आधारमा स्वतन्त्र रचना १.२ काल, पक्ष, भाव, वाच्य, प्रेरणार्थ, करण र उक्ति परिवर्तनका आधारमा वाक्यान्तरण १.३ वाक्य संश्लेषण र विश्लेषण १.४ व्याकरणिक संसक्ति १.५ कोशीय संसक्ति
<ul style="list-style-type: none"> ● अनुच्छेदका सूचना र तथ्यलाई वृत्ताकार, स्तम्भ, रेखाचित्र र आरेखमा रूपान्तर गर्न । 	एकाइ दुई : सूचना र तथ्यको रूपान्तर (६) २.१ अनुच्छेदमा प्रस्तुत सूचना र तथ्यलाई तालिका वा चित्राकृति (वृत्ताकार, स्तम्भ) मा रूपान्तर २.२ अनुच्छेदमा प्रस्तुत सूचना र तथ्यलाई रेखाचित्र र आरेखमा रूपान्तर
<ul style="list-style-type: none"> ● नेपाली वाङ्मयका विभिन्न विषयक्षेत्रसँग सम्बन्धित बोधात्मक प्रश्नको उत्तर दिन ● विभिन्न क्षेत्रसँग सम्बन्धित सामान्य तथा विशिष्ट दृष्टांश र अदृष्टांशमा 	एकाइ तिन : प्रयोजनपरक बोध (११) ३.१ पठनबोध ३.१.१ नेपाली वाङ्मयका विविध क्षेत्र र विषयसँग सम्बन्धित सामान्य र विशिष्ट बोध प्रश्नहरूको उत्तर लेखन र प्रस्तुति

<p>आधारित तथ्यपरक, निष्कर्षपरक, अनुमानपरक, तुलनात्मक, व्याख्यात्मक, कार्यकारणात्मक, बोध प्रश्नको उत्तर लेखन गर्न ।</p>	<ul style="list-style-type: none"> • भाषा, • साहित्य, • शिक्षा, • भूगोल, • कृषि, • अर्थवाणिज्य, • सूचना तथा सञ्चार, • मनोविज्ञान, • समाज, • संस्कृति, • दर्शन, • विज्ञान तथा प्रविधि • स्वास्थ्य • वातावरण, • कानून, • खेलकुद <p>३.१.२ सामान्य तथा विशिष्ट प्रकृतिका दृष्टांश र अदृष्टांशमा आधारित तथ्यपरक, निष्कर्षपरक, अनुमानपरक, तुलनात्मक, व्याख्यात्मक, कार्यकारणात्मक, बोध प्रश्नको उत्तर लेखन र प्रस्तुति</p>
<ul style="list-style-type: none"> • निर्देशित र स्वतन्त्र अनुच्छेद रचना गर्न, • आत्मपरक र वस्तुपरक निबन्ध सिर्जना गर्न, • घटना, समारोह र निरीक्षण भ्रमणमा आधारित प्रतिवेदन लेखन । 	<p>एकाइ चार : लिखित अभिव्यक्ति (८)</p> <p>४.१ निर्देशित र स्वतन्त्र अनुच्छेद रचना ४.२ आत्मपरक र वस्तुपरक निबन्ध लेखन ४.३ घटना, समारोह र निरीक्षण भ्रमणमा आधारित प्रतिवेदन लेखन</p>
<ul style="list-style-type: none"> • निर्धारित साहित्यिक कृतिको सरसर्ती अध्ययन गरी प्रतिक्रियात्मक टिप्पणी लेखन । 	<p>एकाइ पाँच : साहित्यिक कृतिको पठन, आस्वादन र प्रतिक्रियात्मक लेखन (११)</p> <p>५.१ कथा ५.१.१ रमेश विकल : मेरी सानी भतिजी प्रतिमा ५.१.२ इस्माली : आज शनिवार</p> <p>५.२ कविता / गीत / गजल ५.२.१ भूपि शेरचन : मैनवत्तीको शिखा ५.२.२ हरिभक्त कटुवाल : रहर ५.२.३ दुर्गालाल श्रेष्ठ : फूलको आँखामा</p> <p>५.३ निबन्ध : ५.३.१ लक्ष्मीप्रसाद देवकोटा : शिक्षा ५.३.२ शारदा शर्मा : सुखसत्ता ५.३.३ युवराज नयाँघरे : भेटौंला कपर्धुमा</p> <p>५.४ उपन्यास ५.४.१ केशवराज पिँडाली : बाँच्ने एउटा जिन्दगी</p>

४. प्रायोगिक क्रियाकलाप र शिक्षण प्रविधि

प्रायोगिक क्रियाकलाप र शिक्षण प्रविधिलाई दुई समूहमा विभाजन गरिएको छ : पहिलोमा साधारण शिक्षण प्रविधि र दोस्रोमा विशिष्ट शिक्षण प्रविधि ।

४.१ साधारण शिक्षण प्रविधि

प्रत्येक एकाइमा आवश्यकताअनुसार शिक्षकले सम्बन्धित विषयवस्तुको प्रस्तुति, व्याख्यान, छलफल, प्रश्नोत्तर गराई विद्यार्थीहरूलाई तत्सम्बन्धी अभ्यास गर्न लगाइने छ ।

४.२ विशिष्ट शिक्षण प्रविधि

एकाइ	ीक्रियाकलाप
एक	<ul style="list-style-type: none"> व्यक्तिगत रूपमा काल, पक्ष, भाव, वाच्य, करणका आधारमा स्वतन्त्र रचना तयार गरी कक्षामा प्रस्तुत गर्न लगाउने, जोडी समूहमा विभिन्न प्रकारका वाक्यहरू दिई संश्लेषण गर्न र संश्लेषित वाक्यहरूलाई विश्लेषण गर्न लगाउने, समूहअनुसार पाठ्यसामग्रीमा आधारित भई व्याकरणिक संसक्ति र कोशीय संसक्तिको उदाहरण खोजी कक्षामा प्रस्तुत गर्न लगाउने ।
दुई	<ul style="list-style-type: none"> जोडी समूहका रूपमा पाठ्य सामग्री हेरी विभिन्न प्रकारका सूचना र तथ्यलाई वृत्ताकार, स्तम्भ, आरेख र रेखाचित्रमा प्रस्तुत गर्न लगाउने,
तिन	<ul style="list-style-type: none"> समूह अनुसार विभिन्न विषय क्षेत्रसँग सम्बन्धित सामग्रीमा आधारित भई बोध प्रश्नको उत्तर लेख्न लगाउने र कक्षामा प्रस्तुत गर्न लगाउने
चार	<p>(क) निर्देशनअनुसार स्वतन्त्र र निर्देशित प्रकृतिका अनुच्छेद वैयक्तिक रूपमा लेखन गरी कक्षामा प्रस्तुत गर्न लगाउने</p> <p>(ख) दिइएको शीर्षकमा संरचनाअनुसार समूहगत प्रतिवेदन लेखन गराई कक्षामा प्रस्तुत गर्न लगाउने</p>
पाँच	<ul style="list-style-type: none"> निर्धारित साहित्यिक कृतिको पठन, आस्वादन र प्रतिक्रियात्मक लेखनका लागि व्यक्तिगत वा सामूहिक अभ्यास गर्न लगाउने ।

५. मूल्याङ्कन प्रक्रिया

मूल्याङ्कन दुई प्रकारले गरिने छ :

- (१) **आन्तरिक मूल्याङ्कन** : यसका निमित्त चालिस प्रतिशत अङ्क निर्धारण गरिएको छ । आन्तरिक मूल्याङ्कन कक्षा शिक्षणसँगै गरिने छ । यसको वितरण निम्नानुसार रहेको छ :

आन्तरिक मूल्याङ्कन (४० प्रतिशत)

ीक्रियाकलाप	अङ्क
● उपस्थिति	५
● सिकाइ क्रियाकलापमा सहभागिता	५
● पहिलो आन्तरिक परीक्षा	१०
● दोस्रो आन्तरिक परीक्षा	१०
● तेस्रो आन्तरिक परीक्षा	१०
जम्मा	४०

- (२) **बाह्य मूल्याङ्कन**: यसका निमित्त साठी प्रतिशत अङ्क निर्धारण गरिएको छ । बाह्य मूल्याङ्कन दिन कार्यालयले निर्धारण गरेको सेमेस्टर प्रणालीअनुसार हुने छ । यसका लागि निम्नानुसारको प्रश्नका लागि निम्नानुसारको अङ्क विभाजन गरिएको छ ।

बाह्य परीक्षा (६० प्रतिशत)

प्रश्नको किसिम	अङ्क
● बहु बैकल्पिक प्रश्न (१०×१ = १०)	१०
● संक्षिप्त उत्तरात्मक प्रश्न (६×५ = ३०)	३०
● विवेचनात्मक प्रश्न (२×१० = २०)	२०
जम्मा	६०

पाठ्यपुस्तक

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सन्दर्भ सामग्री

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Course Title: **General English II**

Course No. : Eng.Ed. 421

Level: B. Ed

Semester: Second

Nature of the course: Theoretical

Credit hours: 3

Teaching hours: 48

1. Course Description

This course is designed to develop their proficiency in listening, speaking, reading and writing. It also intends to equip them with knowledge of vocabulary needed for academic purpose. The course includes listening, speaking, reading and writing components. The listening, speaking and reading components deal with a wide variety of carefully selected materials. They include, among other things, informative passages on contemporary and critical issues. The writing part includes materials geared to developing various writing skills required for effective communication on matters of general and academic interests.

2. General Objectives

The general objectives of this course are as follows:

- To help students listen for comprehension.
- To help students make fluent speaker.
- To familiarize students with the techniques of enriching vocabulary.
- To develop in students an ability to comprehend and interpret different kinds of written texts by exposing them to a wide variety of authentic contemporary reading materials.
- To develop in students different kinds of writing skills needed for effective communication on matters of general and academic interests.

3. Specific Objectives and Contents

Specific Objectives	Contents
<ul style="list-style-type: none">• Use prior knowledge and personal experience to predict content• Listen for main ideas and details• Make inferences to fully understand what a speaker means• Listen for opinion to understand book review• Listen for reduced verb forms to understand everyday speech• Listen for causes and effects to understand relationships among idea• Follow a summary for several ideas• Listen for opinion	Unit I. Listening (10) 1.1. First impression 1.2. The psychology of first impression 1.3. Making inferences and listening for main ideas and details 1.4. Reviewing a book 1.5. Listening for causes and effects 1.6. Taking notes using a T- chart 1.7. Changing expectations 1.8. Corporate social and personal responsibility 1.9. Inferring a speakers attitude 1.10. Identifying fact and opinion, amounts 1.11. Advertising ethics and standards 1.12. Financing a dream 1.13. Understanding figurative meaning

<ul style="list-style-type: none"> • Make notes to prepare for a presentation or group discussion • Take turns to make conversation go smoothly • Imply opinions to avoid stating them too directly • Give advice and reasons • Ask for clarification • Clarify what you say • Describe a situation using details • Ask, express and use reasons • Make notes • Prepare a dialogue 	<p>Unit II: Speaking (8)</p> <p>2.1 Taking conversation turns 2.2 Asking for and giving clarification 2.3 Asking for and giving reasons 2.4 Leading a group discussion 2.5 Giving and supporting your opinions and ideas 2.6 Giving a short presentation 2.7 Recapping a presentation 2.8 Agreeing and disagreeing 2.9 Expressing emotions</p>
<ul style="list-style-type: none"> • Read texts for general idea. • Find specific information in the text. • Comprehend the text for detailed understanding. • Read and make notes of the important points. • Draw inferences and implications from varieties of reading texts. • Give opinions and express attitudes. 	<p>Unit III: Reading (15)</p> <p>3.1 Determining co-references 3.2 Matching things 3.3 Understanding instructions 3.4 Unscrambling texts and anagrams 3.5 Scanning: locating and extracting information 3.6 Skimming: finding out main point and the central idea 3.7 Drawing inferences and implications 3.8 Assessing opinions and attitudes 3.9 Solving problems and puzzles</p>
<ul style="list-style-type: none"> • Write an imaginary dialogue, short sketch of a person, story • Prepare a speech and Post card • Write a report • Rewrite given texts in different forms. • Compose short and long texts in the given topics. • Write texts maintaining coherence and cohesion. • Interpret different types of texts. • Explain opinions and attitudes. • Write letters, resumes, summaries and short reports. • Write varieties of essays. 	<p>Unit IV: Writing (15)</p> <p>4.1 Rewriting: Rephrasing and paraphrasing 4.2 Parallel writing 4.3 Completing a text 4.4 Organizing a text: Sequencing instructions, ordering information, connecting ideas 4.5 Writing summaries 4.6 Writing letters: Personal, business, job application 4.7 Writing curriculum vitae (resume) 4.8 Writing reports: Events and news 4.9 Writing essays: Descriptive, expository, narrative, argumentative</p>

4. Instructional Techniques

The instructional techniques for this course are divided into two groups. First group consists of general instructional techniques applicable to most of the units. The second group consists of specific instructional techniques applicable to specific units.

4.1 General Instructional Techniques

Following general techniques are suggested for the overall delivery of the course.

- Lecture
- Discussion
- Explanation
- Illustration
- Demonstration
- Quizzes

- Guided study

It is expected that students are fully engaged in the lesson and sessions are interactive while presenting the lesson.

4.2 Specific Instructional Techniques

Some specific techniques are suggested to ensure the active engagement of the students.

Unit I	Small group discussion for the various grammar points, pair work to find out the rules of language, mini-projects to research the various grammar points in the texts.
Unit II	Individual practice and small group discussion and pair work.
Unit III	Individual study, pair work for reading tasks and presentation.
Unit IV	Individual assignment on various writing tasks, small group discussion and presentation.

In addition to the techniques mentioned above, observation of an English language class where children with different abilities are studying followed by presentation is also encouraged in all the units.

5. Evaluation and Time Allotment

The time and weighting allocated for the entire course is as follows:

<u>Unit</u>	<u>weighting</u>	<u>Time</u>
I Grammar	20%	20%
II Vocabulary	15%	15%
II Reading	30%	30%
III Writing	35%	35%

5.1 Internal Evaluation 40%

Internal evaluation will be conducted by course teacher based on following activities:

- Attendance 5 Points
- Participation in learning activities 5 points
- First assignment/midterm exam 10 points
- Second assignment/assessment (1 or two) 10 points
- Third assignment/assessment 10 points

Total 40 points

5.2 External Evaluation (Final Examination) 60%

Examination Division, Office of the Dean, Faculty of Education will conduct final examination at the end of the semester. Type of questions and the points allocated for them are as follows:

• Objective type question (Multiple choice 10 × 1 point	= 10 points
• Short answer questions (6 questions × 5 points)	= 30 points
• Long answer questions (2 questions × 10)	= 20 points
Total	60 points

6. Recommended Books and Reference Materials

Recommended Books

Awasthi, J. R. , Bhattarai, G. R. & Rai, V. S. (eds.) (2008). *English for the New Millennium*. Kathmandu: EKTA Books. **(For units III to IV) (Selected Lessons)**

Craven, M. and Sherman, K.D. (2011). *Q: Skills for Success: 3: Listening and Speaking*. Oxford: Oxford University Press. **(For units I and II)**

Following lessons have been selected from the book **English for the New Millennium:**

Unit I : Legend, Lore and Education

- Whole Child Education
- The Five Dimensions of Education
- The Essentials of Education

Unit II: Short Stories

- The Gateman's Gift
- The Martyr
- The Joys of Motherhood
- Grief

Unit III: Non Fictional/ Factual Writings

- I Once Was Lost
- Albert Einstein
- Music and Science

Unit IV: Essays

- Victory on Everest
- Laughter is the Best Medicine
- Liberty and Democracy

Unit V: Interviews

- ImreKertesz

Unit VI: One Act Plays

- A Horseman in the Sky

Unit VII: Memoir and Travel

- The Boatman's Gift

Unit VII: Journals

- Journal Writing II

Unit IX: Novel Extract and Motion Picture

- My Love Story with the City of Joys

Unit X: Contemporary Topics

- a. Inclusive Education
- b. English as a World Language
- c. Diasporas and Language
- d. The New Electronic Media

Unit XI: Poems

- a. Composed upon Westminster Bridge
- b. Mid-Summer Noon in the Australian Forest
- c. Baby's World
- d. Butcher Shop
- e. If
- f. Before the Battle
- g. Letter from Foreign Grave
- h. Sonnet

Reference

Hornby, A.S. (2010). *Oxford Advanced Learner's Dictionary* (8th Edition). Oxford: Oxford University Press.

Course title: **Social Perspectives in Education**

Course No. : Ed. 421

Level: B.Ed.

Semester: Second

Nature of Course: Theoretical

Credit hours: 3

Total teaching hours: 48

1. Course Description

This is a core course of B. Ed. This course is designed to provide students with an understanding of how social aspects interact with education. It is also designed to help students understand different social perspectives, their issues, reform movements and their associated programs. The course uses current research and sociological theory to understand Nepalese education within a global context, examine the impact of relevant government policies for schooling and to understand the interaction of sociological factors in relation to student achievements. Moreover, students will need to demonstrate an understanding of how a variety of social and cultural factors including socioeconomic status, ethnicity and cultural background, gender, geographic location and religion may impact learning and achievement of the students.

General Objectives

The general objectives of this course are as follows:

- To provide the students with deeper and broader understanding of social perspectives of education.
- To provide the students with in-depth knowledge on different aspects of schools and society.
- To develop the understanding of social environment and its influences on students' achievement.
- To acquaint the students with the development programs and reforms in different periods in Nepal.
- To make the students familiar with the social policy and education in national context and for international understanding.
- To develop students' understanding of participatory approached of different local and district level plans in Nepal.

2. Specific Objectives and Contents

Specific Objectives	Contents
<ul style="list-style-type: none">• Explain the concept of social perspectives of education• Discuss the contents of sociology of education• Clarify the sociological perspectives in education	Unit I: Sociology of Education (5) 1.1 Concept of social perspectives in education 1.2 Concept of sociology and sociology of education 1.3 Contents of sociology of education 1.4 Sociological perspectives in education 1.4.1 Structural-functional 1.4.2 Conflict 1.4.3 Symbolic interaction
<ul style="list-style-type: none">• Explain school as a sub-system of society.• Clarify meaning and importance of socialization.• Describe different agencies of socialization.• Describe the influence of social environment in school	Unit II: The School and Society (14) 2.1 School as a sub-system of society 2.2 Socialization 2.2.1 Meaning 2.2.2 Importance 2.3 Agencies of education and socialization 2.3.1 Family 2.3.2 Peer Group

	2.3.3 School 2.3.4 Community 2.3.5 Association media 2.3.6 Political, religious and economical groups 2.4 Educational system and the environment 2.4.1 Home and family influences on school 2.4.2 Influence of religion on school 2.4.3 Financing of schools 2.4.4 Influence of political and legal institutions on schools 2.4.5 Influence of community on school
<ul style="list-style-type: none"> Clarify different social issues related to education system of Nepal. Explain the influence of different social factors on educational access and achievement in the context of Nepal 	Unit III Social issues and education (7) 3.1 Social class and status group 3.2 Caste and ethnicity 3.3 Gender 3.4 Language 3.5 Religion 3.6 Geography 3.7 Influence of these factors on educational access and achievement in the context of Nepal
<ul style="list-style-type: none"> Explain the meaning of social policy in education. Clarify the concept and measures of equality and equity in education. Discuss the role of equality and equity in access and achievement in school education in Nepal. Elaborate right based approach to education with reference to human right, child right, women’s right and people with disability in Nepalese context. Explain the need of education for national integration. Explain education from international understanding 	Unit IV: Social Policy and Education (12) 4.1 Meaning of social policy in education 4.2 Equality and equity in education 4.2.1 Concept and measures 4.2.2 Access and achievement in school education in Nepal 4.3 Right based approach to education 4.3.1 Human right 4.3.2 Child right 4.3.3 Women’s right 4.3.4 Right of people with disability 4.4 Provision of these rights in Nepalese context 4.5 Inclusive education 4.6 Education for national integration 4.7 Education for international understanding
<ul style="list-style-type: none"> Elaborate the education programs and reforms in Nepal before democratic period, in transition period, democratic reform period. 	Unit V Education programs and reforms in different periods in Nepal (7) 5.1 Pre-democratic period (before 2007 B.S.) 5.2 Transition period (2007 B.S. to 2027 B.S.) 5.3 Reform period (2028 to 2046 B.S.) 5.4 Democratic reform period (2046 B.S. onwards)
<ul style="list-style-type: none"> Review the participatory planning process of local and districts level education plans VIP, SIP, DEP. 	Unit VI: Critical review of participatory planning process (3) 6.1 School Improvement Plan (SIP)

	6.2 Village Education Plan (VEP)
	6.3 District Education Plan (DEP)

Note: The figures in the parentheses indicate the approximate periods for the respective units.

2 Instructional Techniques

The instructional techniques for this course are divided into two groups. The first group consists of general instructional techniques applicable to most of the units. The second group consists of specific instructional techniques applicable to specific units.

4.3 General Instructional Techniques

- Lecture
- discussion
- Question answer

4.4 Instructional Techniques

Unit	Suggested Instructional Techniques
II and III	Students will be divided into groups and given different topics for group work. Groups will prepare report and share in the class. Presentation will be followed by discussion and suggestions.
V	Groups of students will collect different plans study them to identify strengths and weaknesses in relation to participatory process in these plans.

5. Evaluation

5.1 Internal Evaluation (40%)

Internal evaluation will be conducted by subject teacher based on following activities:

• Attendance	5
• Class participation	5
• First assignment	10
• Second assignment	10
• Third assignment	10
Total	40

5.2 Final/Semester Evaluation (60%)

Examination Division, office of the Dean, Faculty of Education will conduct final examination at the end of semester.

• Objective type question (Multiple choice 10 x 1pnts)	10
• Short answer questions (6 questions x 5 points)	30
• Long answer questions (2 questions x 10 points)	20
Total	60

6. Recommended Books and References

Recommended Books

- Ballantine, J. H. (1997). *The sociology of education: A systematic analysis*. New Jersey: Prentice Hall. (Unit II).
- Crow, & Crow, A. (1976). *Introduction to education*, New Delhi: Eurabia, Publishing House. (For units I & II)
- Dash, B. N. (1995). *Foundations of education thought and practice* Calculatta: Kalyani Publication. (For units I, II & VI)

- Mohanty, Jagannath (2005). *Teaching of sociology: New trends and innovations*. New Delhi: Deep & Deep Publications Pvt. Ltd. (Unit I)
- Morris, V. C. et. al (1963). *Becoming an educator*. Boston: Houghton Mifflin Company. (For Unit II)
- Ornstein, A. C. and Levine D.U. (1989). *Foundations of Education (4th ed.)*. Boston: Houghton Mifflin Company. (Unit I and II).
- Ottaway, A. K. C. (1964). *Education and society. and introduction to sociology of education* London: Routledge and Kegan Paul. (For units I & II)
- शिक्षाका आयोगहरू (For unit - V)
- नेपाल राष्ट्रिय शिक्षा योजना आयोगको प्रतिवेदन २०११
- सर्वाङ्गिण राष्ट्रिय शिक्षा समितिको प्रतिवेदन २०१८
- राष्ट्रिय शिक्षा पद्धतिको योजना २०२८
- शाही उच्च शिक्षा आयोगको प्रतिवेदन २०४०
- राष्ट्रिय शिक्षा आयोगको प्रतिवेदन २०४९
- उच्च स्तरीय राष्ट्रिय शिक्षा आयोगको प्रतिवेदन २०५५
- नेपाल सरकार, शिक्षा विभाग, पाठ्यक्रम विकास केन्द्र, अनौपचारिक शिक्षा परिषद्, शैक्षिक जनशक्ति विकास केन्द्रकाका जर्नलहरू I (For unit V & VI)
- शर्मा गोपीनाथ, (२०४३), नेपालको शिक्षाका इतिहास, श्रीमती हेमकुमारी शर्मा I (For unit V)

References

- Aryal, P. N. et al. (2065). *Philosophical and sociological foundations of education*, Kirtipur: Quest Publication.
- Bhatia, K. K. (1983). *Principles and practices of education*, Ludhiana: Kalyani Publishers.
- Bhattarai, H. N. (2063). *Foundations of education*, Kathmandu: Jupiter Publisher and Distributor.
- Coombs, P. H. (1960). *The world educational crisis: system analysis* Allahabad: A. H. Wheetoer & Co. Pvt. Ltd.
- Dhakal, M. P. (2063). *Philosophical and sociological foundations of education*, Kathmandu: Bidhyarthi Pustak Bhandar.
- Dorothy, (1965). *Social perspective on education. The society, the student, the school*. New York: John Wiley & sons. Inc.
- Faure, E. et.al. (1992), *Learning to be, the world education today and tomorrow*. Paris: UNESCO.
- Hammadi, A. H. (1989). *Open University (retrospect and prospect)*, Delhi: Bibliographics: Bureau.
- Kneller, G. E. (1967). *Foundations of education (2nd ed)* Sydney: John Wiles and Sons, Inc.
- Shrestha, C. B. & Basnet, S. (2063). *Philosophical and sociological foundations of education*. Kathmandu: Bhudi Puran Prakashan.
- Thio, A. (1968). *An introduction to sociology*. New York: Happer & Row Publisher.

1. Course Description

This course provides students with the basic concepts of digital logic, organization and architecture of digital computers as foundation for more advanced computer related studies. It also intends to provides the skill on able to design simple digital devices and implement them. It covers the knowledge area of digital system, logic gates and Boolean algebra, combinational and sequential circuit design, registers, counters, memories and programmable logic devices and VHDL. Laboratory work is essential in this course.

2. Course Objectives

Following are the general objective of this course:

- To make the student knowledgeable about fundamental digital logics and switching networks as well as to exposure of Boolean Algebra and its application for circuit analysis.
- To enable the student to identify the design concept of multilevel gates networks, flip-flops, counters and logic devices.

3. Specific Objectives and Contents

Specific Objectives	Contents
<ul style="list-style-type: none"> • Differentiate between digital and analog system. • Calculate and converse the number system digital, binary, octal and hexadecimal. • Execute the different number system in arithmetic. • Define codes such as ASCII, EBCDIC & UNICODE. • Explain the error detection and error correction concept. 	<p>Unit 1: Introduction to Digital System (10)</p> <p>1.1 Introduction to Analog and digital system</p> <p>1.2 Features of Digital Systems</p> <p>1.3. Number Systems- Decimal, Binary, Octal, Hexadecimal and their inter conversions</p> <p>1.4. Binary Arithmetic. complement system and subtraction using 1's, 2's, 9's, and 10's complement method</p> <p>1.5. Codes: BCD, XS-3, Gray code, hamming code, alphanumeric codes (ASCII, EBCDIC, UNICODE),</p> <p>1.6. Error detecting and error correcting codes.</p> <p>Lab Work:</p> <ul style="list-style-type: none"> • Practices on Number conversion between Decimal, Binary, Octal, Hexadecimal. • Binary Arithmetic 1's, 2's, 9's, and 10's
<ul style="list-style-type: none"> • Explain Boolean Logic and Boolean Algebra • Generate the logic gates with diagram, truth table and Boolean function. • Explain Boolean Algebra and laws of Boolean Algebra • Identify the universal gate. 	<p>Unit 2: Logic Gates and Boolean Algebra (10)</p> <p>2.1. Basic definition of Boolean Algebra</p> <p>2.2. Basic Theory of Boolean Algebra, Boolean Functions, Logical operations</p> <p>2.3. Logic Gates, IC Digital Logic Families. Basic gates (AND, OR, NOT gates)</p> <p>2.4. Universal gates (NAND and NOR gates), other gates (XOR, XNOR gates)</p> <p>2.5. Boolean identities, De Morgan Laws.</p> <p>Lab Work:</p> <ul style="list-style-type: none"> • Verification of AND, OR, NOT, NAND, NOR, XOR, and XNOR gate.

<ul style="list-style-type: none"> • Simplification of Boolean algebra with the use Boolean rules • Solve the Boolean expressions using Boolean algebra, K-Map and Quine McClusky Method 	<p>Unit 3: Simplification of Boolean Functions (10)</p> <p>3.1 Simplification of Boolean algebra using Boolean rules</p> <p>3.2 K-map method (two, three, and four Variable Maps), Don't care conditions</p> <p>3.3 Canonical and standard forms, product of Sums, sum of product simplification</p> <p>3.4 NAND and NOR implementation</p> <p>3.5 Quine McClusky method.</p> <p>Lab Work:</p> <ul style="list-style-type: none"> • Apply to simplification Boolean expression using Boolean rules. • Apply to simplification Boolean expression using K-Map Method. • Apply to simplification Boolean expression using Quine McClusky Method.
<ul style="list-style-type: none"> • Explain combinational circuits • Implement the adder, multiplexers and de-multiplexers • Implement the encoders and decoder • Design combinational circuit design • Design binary and decimal adder 	<p>Unit 4: Combinational Circuit Design (12)</p> <p>4.1 Half adder, full adder, half subtracter, and full subtracter.</p> <p>4.2 Code converters</p> <p>4.3 Multiplexers and demultiplexers</p> <p>4.4 Encoders and decoders</p> <p>4.5 Combinational Circuit design procedure</p> <p>4.6 Binary Parallel Adder</p> <p>4.7 Decimal Adder</p> <p>Lab Work:</p> <ul style="list-style-type: none"> • Design the adder and subtracter • Implement logic of Mux/Demux and Encoder/Decoder • Design the number system converter circuit • Design Various Decision making circuits.
<ul style="list-style-type: none"> • Explain Sequential Logic Circuits • Design Flip-flops • Create flip-flop excitation table 	<p>Unit 5: Sequential Circuit Design (7)</p> <p>5.1. Flip-flops: RS, JK, D, and T, Latches</p> <p>5.2 Triggering of flip-flops</p> <p>5.3 Master slave flip flop</p> <p>5.4 Flip-flop excitation table and design procedure.</p> <p>5.5 state diagram and simple sequential circuits</p> <p>Lab Work:</p> <ul style="list-style-type: none"> • Design the different types of flip-flops.
<ul style="list-style-type: none"> • Explain counters and Shift Registers. • Define electronics part of memories • Describe digital logic families • Analyze and design synchronous sequential circuits • Analyze asynchronous sequential circuits 	<p>Unit 6: Registers, Counters, Memories and Programmable Logic Devices (15)</p> <p>6.1 Registers, Shift registers</p> <p>6.2 Analysis of synchronous sequential circuit</p> <p>6.3 Design of synchronous sequential Circuits: Counters, state diagram, state reduction, state assignment</p> <p>6.4 Analysis of asynchronous sequential circuit</p> <p>6.5 Problems of asynchronous sequential circuit design</p> <p>6.6 Memories: ROM, PROM, EPROM</p>

	6.7PLD, PLA 6.8Digital Logic Families: TTL, ECL, and CMOS Lab Work: <ul style="list-style-type: none"> • Design any clock driven sequential circuit • Design verify the principle of conversion of parallel data into serial.
<ul style="list-style-type: none"> • Define concept of VHDL • Design simple circuits by using VHDL 	Unit 7: VHDL (10) 7.1 RTL Design with VHDL 7.1.1 Shape of VHDL 7.1.2 Data Types 7.1.3 Concurrent Statements 7.1.4 Processes and Variables 7.1.5 Simulating a Simple Design 7.1.6 Creating Memory 7.1.7 Finite State Machines 7.1.8 Loops and Conditional Elaboration 7.1.9 Attributes 7.1.10 Functions and Procedures LAB Work: <ul style="list-style-type: none"> • Demonstrate the different circuit in VHDL Tools
<ul style="list-style-type: none"> • Design real world logic circuits using VHDL or any other hardware design tools 	Unit 8. Project Work (6)

4. Instructional Techniques

The instructional techniques for this course are divided into two groups. First group consists of general instructional techniques applicable to most of the units. The second group consists of specific instructional techniques applicable to particular units.

4.1 General Instructional Techniques

Reading materials will be provided to students in each unit. Lecture, Discussion, use of multi-media projector, brain storming are used in all units.

4.2 Specific Instructional Techniques

Demonstration is an essential instructional technique for all units in this course during teaching learning process. Unit one and three are theoretical and numerical chapters so, they require more exercise and demonstration of principles. Use more pictures, flowchart of method, and assignment. Specifically, demonstration with practical works will be specific instructional technique in this course. The details of suggested instructional techniques are presented below:

Units	Activities
Unit 2: Logic Gates and Boolean Algebra	<ul style="list-style-type: none"> • Verify AND, OR, NOT, NAND, NOR, XOR, and XNOR gate using physical real bread board and two input TTL ICs. • Demonstration by the teacher on physical real device and circuitry design to demonstrate the working principle, objective and their use. • Individual lab work of real bread board by each student • Monitoring of students' work by reaching each student and providing feedback for improvement • Presentation by students followed by peers' comments and teacher's

	feedback
Unit 4: Combinational Circuit Design	<ul style="list-style-type: none"> • Design the adder and subtracter, Implement logic of Mux/Demux and Encoder/Decoder, and Design the number system converter circuit, Design Various Decision making circuits. • Lab work in pairs in different tasks assigned by the teacher • Monitoring of students' work by reaching each pair and providing feedback for improvement • Presentation by students followed by peers' comments and teacher's feedback
Unit 5: Sequential Circuit Design	<ul style="list-style-type: none"> • Design RS, JD, D and T flip-flops with their excitation table and design procedure. • Demonstrate the objective, use and practically implement the master slave flip-flop. • Demonstrate the state diagram of any simple sequential circuit. • Monitoring of students' work by reaching each student and providing feedback for improvement • Presentation by students followed by peers' comments and teacher's feedback
Unit 6: Registers, Counters, Memories and Programmable Logic Devices	<ul style="list-style-type: none"> • Demonstrate the implement the concept, objective and real use of registers, counters, memories and PLDs. • Design any clock driven sequential circuit, verify the principle of conversion of parallel data into serial. Design circuits like: digital clock, voting system, counting machine, storage device, traffic control system, frequency division circuits, and analyze circuits. • Demonstrate the interfacing method with various types of logic families and integrated circuits. • Monitoring of students' work by reaching each student and providing feedback for improvement • Presentation by students followed by peers' comments and teacher's feedback
Unit 7: VHDL	<ul style="list-style-type: none"> • Explain the fundamental of VHDL programming language using class lecture method. • VHDL language should be taught to specify the logic circuits. Instructor should illustrate how VHDL can be used to specify the desired functionality and how CAD tools provide a mechanism for developing the required circuits. Instructor should assign design projects like Adder/Subtractor, Multiplexer/Demultiplexer, Encoder/Decoder, Flip-flops, register and counters to each individual using both methodologies: manual design and CAD tools to design logic circuits.
Project Work	<ul style="list-style-type: none"> • Design any real world digital logic circuit using combinational and sequential circuits. • Use VHDL programming language. • It is a project to be completed by individual student under the direct supervision of project supervisor.

5. Evaluation :

Internal Assessment	External Practical Exam/Viva	Semester Examination	Total Marks
40 Points	20 Points	40 Points	100 Points

Note: Students must pass separately in internal assessment, external practical exam and semester examination.

5.1 Internal Evaluation (40 Points):

Internal evaluation will be conducted by subject teacher based on following criteria:

- | | |
|---|-----------|
| 1) Class Attendance | 5 points |
| 2) Learning activities and class performance | 5 points |
| 3) First assignment (written assignment) | 10 points |
| 4) Second assignment (Case Study/project work with presentation) | 10 points |
| 5) Terminals Examination | 10 Points |

Total	40 points
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5.2 Semester Examination (40 Points)

Examination Division, Dean office will conduct final examination at the end of semester.

- | | |
|--|-----------|
| 1) Objective question (Multiple choice 10 questions x 1mark) | 10 Points |
| 2) Subjective answer questions (6 questions x 5 marks) | 30 Points |

Total	40 points
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5.3 External Practical Exam/Viva (20 Points):

Examination Division, Dean Office will conduct final practical examination at the end of semester.

6. Recommended Books and References materials

Recommended Books:

Floyd, T. L. (2009). *Digital fundamentals* (10th ed). Upper Saddle River, N.J: Pearson/Prentice Hall.

Mano, M. M., & Kime, C. R. (2008). *Logic and computer design fundamentals* (4. ed). Upper Saddle River, NJ: Pearson Prentice Hall.

References materials:

Brown, S. D., & Vranesic, Z. G. (2014). *Fundamentals of digital logic with Verilog design* (Third edition). New York: McGraw-Hill Higher Education.

Rafiqzaman, M. (2005). *Fundamentals of digital logic and microcomputer design* (5th ed). Hoboken, N.J: J. Wiley & Sons.

Mano, M. M. (2002). *Digital design* (3rd ed). Upper Saddle River, NJ: Prentice-Hall.

Course Title: **Object Oriented Programming with C++**

Course No. : ICT. Ed. 426

Level: B.Ed.

Semester: Second

Nature of course: Theoretical + Practical

Credit Hour: 3 hours (2T+1P)

Teaching Hour: 80hours (32+48)

1. Course Description

The aim of the course is to develop the skill on thinking about computation and problem solving in Object Oriented Paradigms. The course helps the students to discover the basic concepts of object-oriented programming concept such as object, class, inheritance, polymorphism, abstraction and encapsulation and apply in C++. Students are more engaged in laboratory work to execution of programming experiments rather than theoretical concept.

2. General Objectives

Following are the general objective of this course:

- To acquaint the student with fundamentals object oriented paradigms and programming style in C++ programming language.
- To develop the skill on apply object oriented programming concept in programming.
- To enable a student in explore the new software development paradigms.

3. Course Outlines:

Specific Objectives	Contents
<ul style="list-style-type: none">• Compare procedure and object oriented programming concept• Describe the feature of object oriented programming.• List out the C++ compilers• Compare coding structure of C and C++.• Demonstrate the C++ programming styles.	<p>Unit 1: Concept of Object Oriented Programming (12)</p> <ul style="list-style-type: none">1.1 Programming Languages and Software Crisis1.2 Procedure Vs Object Oriented Programming Language1.3 Feature of Object Oriented Programming1.4 Popular Object Oriented Programming Language and features1.5 Advantage and Disadvantage of OOPs1.6 Introduction of C++ and Compilers1.7 Programming Structure in C++1.8 Comparison on C and C++1.9 Additional Data types, token in C++1.10 Insertion and Extraction Operators <p>Practical Works:</p> <ul style="list-style-type: none">• Install the compiler of C++.• Use Insertion and Extraction Operator.• Compare the C and C++ Compiler and structure
<ul style="list-style-type: none">• Explain the Object and Class• Define Data member and Member function.• Define inline member function.• Use array in member function and objects.• Define static and friends function.• Explain constructor and destructors.	<p>Unit 2: Object and Class (16)</p> <ul style="list-style-type: none">2.1 Concept of Object and Class2.2 Define Data Member and Member Function2.3 Create object and access Member Function2.4 Making outer function inline2.5 Array with in Class2.6 Array of Objects2.7 Static Data Member and Static Function2.8 Friends Functions2.9 Concept of Constructor and Destructor2.10 Empty, Parameterized and Copy constructor

	<p>2.11 Define Destructor</p> <p><u>Practical Works:</u></p> <ul style="list-style-type: none"> • Create class and objects with data member and member function. • Declare and define member function and data member with visibility. • Create static function • Create friend functions. • Create different types of constructors
<ul style="list-style-type: none"> • Explore the concept of constructor and Destructors. • Apply Binary operator and unary operator overloading. • Describe data conversion methods. 	<p>Unit 3: Operator Overloading (12)</p> <p>3.1 Concept of Operator Overloading</p> <p>3.2 Defining Operator Overloading</p> <p>3.3 Rules of Operating Overloading</p> <p>3.4 Unary Operator Overloading</p> <p>3.5 Return types in overloading function</p> <p>3.6 Binary Operator Overloading</p> <p>3.7 Manipulation String using Operator Overloading</p> <p>3.8 New and Delete Operator Overloading</p> <p>3.9 Data Conversion</p> <p><u>Practical Works:</u></p> <ul style="list-style-type: none"> • Create unary operator overloading. • Apply different types of operator overloading function return methods. • Apply binary operator overloading. • Create Data conversion methods
<ul style="list-style-type: none"> • Explore the concept of inheritance • Describe the base class and access specifier . • Apply single, multiple, multilevel inheritance. • Use constructor in Derived class. 	<p>Unit 4: Inheritance (12)</p> <p>4.1 Concept of Inheritance</p> <p>4.2 Base and Derived Class</p> <p>4.3 Private, Public and Protected Specifier</p> <p>4.4 Derived class declaration</p> <p>4.5 Member function overriding</p> <p>4.6 Single, Multiple, multilevel and hybrid Inheritance</p> <p>4.7 Ambiguity problems in inheritance</p> <p>4.8 Constructor in Derived Class</p> <p>4.9 Extending operator overloading in derived class</p> <p><u>Practical Works:</u></p> <ul style="list-style-type: none"> • Create single level inheritance. • Create multiple inheritance. • Create multilevel inheritance. • Check the ambiguity problems.
	<p>Unit 5: Virtual Function and Polymorphism (8)</p>

<ul style="list-style-type: none"> • Revision concept of pointer. • Identify need of virtual function. • Describe Virtual function. • Describe the Pure virtual function. • Describe the Abstract and container class 	<p>5.1 Concept of Pointer</p> <p>5.2 Need of virtual function</p> <p>5.3 Definition of Virtual Function</p> <p>5.4 Pure Virtual function</p> <p>5.5 Abstract Class</p> <p>5.6 Container class</p> <p><u>Practical Works:</u></p> <ul style="list-style-type: none"> • Create virtual function. • Create pure virtual function. • Create Abstract and container class.
<ul style="list-style-type: none"> • Explain concept of template. • Define function template and class template. • Apply error handling in programming. • Apply the different exception handling methods. 	<p>Unit 6: Template and Exception Handling (8)</p> <p>6.1 Concept of Template</p> <p>6.2 Function overloading and problems</p> <p>6.3 Function Template</p> <p>6.4 Overloading function template</p> <p>6.5 Class Template</p> <p>6.6 Derived class template</p> <p>6.7 Concept of error handling</p> <p>6.8 Basic of exception handling</p> <p>6.9 Exception handling mechanism: throw, catch and try</p> <p><u>Practical Works:</u></p> <ul style="list-style-type: none"> • Create and apply function template. • Create and apply template class. • Apply try, catch and throw methods in program.
<ul style="list-style-type: none"> • Describe the concept the procedure oriented paradigms. • Describe Object oriented paradigms. • Analysis complexity in software development. • Describe object oriented analysis and design methods. 	<p>Unit 7: Object Oriented System Development (6)</p> <p>7.1 Procedure oriented paradigms</p> <p>7.2 Procedure oriented development Tools</p> <p>7.3 Object Oriented Paradigms</p> <p>7.4 Object-Oriented Programming as a New Paradigm</p> <p>7.5 Computation as Simulation</p> <p>7.6 Coping with Complexity's</p> <p>7.7 Reusable Software</p> <p>7.8 Object-Oriented analysis and Design</p> <p><u>Practical Works:</u></p> <p>Case study on comparison of procedure and object oriented paradigms.</p> <p>.</p>
<ul style="list-style-type: none"> • Create console application using C++. 	<p>Unit 8: Project (6)</p> <p>Develop simple Application using (6) C++ with the feature of class,</p>

object, inheritance, polymorphism and encapsulation.
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4. Instructional Techniques

The instructional techniques for this course are divided into two groups. First group consists of general instructional techniques applicable to most of the units. The second group consists of specific instructional techniques applicable to particular units.

4.1 General Techniques

Reading materials will be provided to students in each unit. Lecture, Discussion, use of multi-media projector, brain storming are used in all units.

4.2 Specific Instructional Techniques

Demonstration is an essential instructional technique for all units in this course during teaching learning process. Specifically, demonstration with practical works will be specific instructional technique in this course. The details of suggested instructional techniques are presented below:

Units	Activities
Unit 1: Concept of Object Oriented Programming	<ul style="list-style-type: none"> • Select and Install the different compiler of C++. • Demonstrate the programming structure of C++. • Compare the other program provide the assignment for understanding of objects oriented paradigms. • Monitoring of students' work by reaching each student and providing feedback for improvement • Presentation by students followed by peers' comments and teacher's feedback
Unit 2: Object and Class	<ul style="list-style-type: none"> • Demonstrate class and object creation methods in C++. • Demonstrate the methods and attributes in Class and access from objects. • Demonstrate the different types of methods such as inline, statics and friends. • Lab work in pairs in different tasks assigned by the teacher • Monitoring of students' work by reaching each pair and providing feedback for improvement • Presentation by students followed by peers' comments and teacher's feedback
Unit 3: Operator Overloading	<ul style="list-style-type: none"> • Demonstrate the unary and binary operator overloading methods. • Lab work in pairs in different tasks assigned by the teacher • Monitoring of students' work by reaching each student and providing feedback for improvement • Presentation by students followed by peers' comments and teacher's feedback
Unit 4: Inheritance	<ul style="list-style-type: none"> • Demonstrate the single, multiple and multilevel inheritance and applied into C++. • Lab work in pairs in different tasks assigned by the teacher. • Monitoring of students' work by reaching each student and providing feedback for improvement • Presentation by students followed by peers' comments and teacher's feedback
Unit 5: Virtual Function and Polymorphism	<ul style="list-style-type: none"> • Demonstrate the virtual and pure virtual functions and application. • Demonstrate the abstract and container class. • Lab work in pairs in different tasks assigned by the teacher. • Monitoring of students' work by reaching each student and

	providing feedback for improvement • Presentation by students followed by peers' comments and teacher's feedback
Unit 6: Template and Exception Handling	• Demonstrate the template function and class. • Demonstrate the exception handling concept in OOPs with reference C++. • Monitoring of students' work by reaching each student and providing feedback for improvement • Presentation by students followed by peers' comments and teacher's feedback
Unit 8: Project	• Develop console application applied with OOPs Concepts.

7. Evaluation :

Internal Assessment	External Practical Exam/Viva	Semester Examination	Total Marks
40 Points	20 Points	40 Points	100 Points

Note: Students must pass separately in internal assessment, external practical exam and semester examination.

7.1 Internal Evaluation (40 Points):

Internal evaluation will be conducted by subject teacher based on following criteria:

6) Class Attendance	5 points
7) Learning activities and class performance	5 points
8) First assignment (written assignment)	10 points
9) Second assignment (Case Study/project work with presentation)	10 points
10) Terminal Examination	10 Points

Total	40 points
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7.2 Semester Examination (40 Points)

Examination Division, Dean office will conduct final examination at the end of semester.

3) Objective question (Multiple choice 10 questions x 1mark)	10 Points
4) Subjective answer questions (6 questions x 5 marks)	30 Points

Total	40 points
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7.3 External Practical Exam/Viva (20 Points):

Examination Division, Dean Office will conduct final practical examination at the end of semester.

5. Recommended books and References materials (including relevant published articles in national and international journals)

Recommended books:

Balagurusamy, E. (2013). *Object oriented programming with C++*. New Delhi: Tata McGraw-Hill (Unit 1-8).

BaralDayasar&BaralDiwakar(2010), *Secrete of Object Orientd Programming in C++*, Kathmandu, BhundipuramPrakashan (Unit 1-8).

References materials:

Robert Lafore(2003), *Object Oriented Programming in Turbo C++*, Galgotia Publications Ltd. India, 2003 (Unit 1-8).

Schildt, H. (2003). *C++: the complete reference* (4th ed). New York: McGraw-Hill.

Lippman, S.B., Lajoie. J., *C++ Primer*, 3rd Ed., Addison Wesley, 1998

Course Title : **Number Theory**
 Course No. : Math Ed. 425
 Level : B Ed (Math Minor)
 Semester : Second

Nature of the Course: Theoretical
 Credit Hours: 3
 Teaching Hours: 48

1. Course Description

This course deals with the study of the arithmetic properties of numbers. It comprises the basic techniques of arithmetic and high school mathematics in their solution. This course includes Diophantine equations, Golbach's conjectures, Euler's and Fermat's theorem, Quadratic reciprocity, Pythagorean triples, Fibonacci's numbers and Pell's equations. Most of the chapters are independent of one another and even mathematical beginners can find it relatively easy to dip and choose at random.

2. The General Objectives

The general objectives of this course are as follows:

- To familiarize students with the techniques of inductive methods and mathematical induction.
- To make students capable in proving and applying the divisibility theorem, Euclidean algorithm and Fundamental theorem of arithmetic.
- To make students competent in proving and applying the theory of congruence in establishing different theorems of Fermat, Wilson and little theorem.
- To enhance the skills of applying Euler's generalization to find quadratic reciprocity.
- To make students competent in applying theorem of perfect number to establish Fermat theorem, Pythagorean triples and Fibonacci number in continued fraction.

3. Specific Objectives and Contents

Specific Objectives	Content
<ul style="list-style-type: none"> • Prove the validity of mathematical statements by Induction. • Test Pascal's rules $\binom{n}{r-1} + \binom{n}{r} = \binom{n+1}{r}$ • Sketch the development of number theory in earlier day. 	<p>Unit I: Review on preliminaries consideration of number theory (4)</p> <p>1.1 Mathematical induction 1.2 Binomial theorem 1.3 Early number theory</p>
<ul style="list-style-type: none"> • Compute gcd by Euclidean algorithm. • Solve the Diophantine equation with integral solution. • Prove the fundamental theorem of arithmetic • Verify the Goldbach's Conjecture. 	<p>Unit II: Divisibility Theory (10)</p> <p>2.1 Euclidean algorithm 2.2 Diophantine equation $ax+by=c$ 2.3 Fundamental theorem of arithmetic 2.4 Goldbach's conjecture</p>
<ul style="list-style-type: none"> • Prove the properties of congruence. • Validate and apply famous conjectures in number theory. • Prove different theorems based on the theory of congruence. 	<p>Unit III: Theory of Congruence and its Application (12)</p> <p>3.1 Properties of congruence 3.2 Linear congruence 3.3 Fermat's theorem 3.4 Littletheorem 3.5 Wilson's theorem</p>
<ul style="list-style-type: none"> • Identify the phi-function. • Find the primitive roots of primes. • Prove theorem in quadratic reciprocity. 	<p>Unit IV: Euler's Generalization and its Application (10)</p> <p>4.1 Euler's phi-function and their properties 4.2 Primitives roots for primes 4.3 Quadraticreciprocity</p>

<ul style="list-style-type: none"> • Prove little theorem. • State and prove Fermat's last theorem. • Use continued fractions to develop arbitrary rational approximation to rational and irrational numbers. 	Unit V: Fermat's Conjecture and Continued Fraction (10) 5.1 Fermat numbers and little theorem 5.2 Pythagorean triples and last theorem 5.3 Fibonacci number and continued fractions
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4. Instructional Techniques

4.1 General Instructional Techniques

Traditional way of teaching and learning of mathematics has degraded into area of rote memorization, the outcome of which leads to satisfactory formal ability but does not lead to real understanding or to greater intellectual independence. Most of mathematics can be understood and developed if it is connected to number theory. So, the goal of this course is to put the meaning back into mathematics. Discussion, lectures, project work will be general instructional technique of delivery of course.

4.2 Specific Instructional Technique

Unit	Specific Activity and Instructional Techniques
I	Experiences will be shared between groups
II	The Demonstration method will be used both giving task to students and showing their task
III	Project assignment on some theorems
IV	Group discussion with sharing
V	Guided Discussion

5. Evaluation

Internal Evaluation 40%

Internal evaluation will be conducted by the subject teacher based on the following aspects:

• Attendance	5 points
• Participation in learning activities	5 points
• First assignment	10 points
• Second assignment/assignment	10 points
• Third assignment/assignment	10 points
<u>Total</u>	<u>40 points</u>

External Evaluation (Final Examination) 60%

Examination Division, Dean's office will conduct final examination at the end of the semester. The types of questions and point allocated for each category of questions are given below:

• Objective Type Question (Multiple Choice 10×1)	10 points
• Short Answer Question (6 Question \times 5 points)	30 points
• Long Answer Question (2 Question \times 10 points)	20 points
<u>Total</u>	<u>60 points</u>

6. Recommended Book and references

Recommended Book

Courant, R.; & Robbins, H. (). *What is mathematics? An elementary approach to ideas and methods*. USA: Oxford University Press.

Burton, D. M. (2002). *Elementary number theory (2nd edition)*. New Delhi: Universal Book Stall.

Reference Books

Koshy, T. (2012). *Elementary number theory with application*. New Delhi: Academic Press.