

Course Title: **ICT in Education**

Course No.: Ed. 431

Level: B.Ed.

Semester: Third

Nature of course: Theoretical + Practical

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

Teaching Hour: 80hours (32+48)

### 1. Course Introduction

ICTs integrated education system is pervasive in school education and higher education in 21st century. Professional teachers need to know about how ICTs are integrated in education system from educational administration to the classroom level and build necessary competencies to use ICT tools in their teaching, learning management and evaluation purposes. This course thus is designed for the students in Bachelor Degree in education aimed to impart both the knowledge of the use of ICTs in education and professional competencies envisaged to be necessary for a 21st century school teachers. This course furthermore has addressed the ICT professional standards set by different organizations and Nepal's own standards as promulgated by the Ministry of Education Nepal. This course is mainly a practical course that the students have to learn things being in action - project works, laboratory works and assignments. Besides there are some theoretical discussion on the use of ICTs theory, philosophy and historical development of ICTs in education.

### 2. General Objectives

- a. Introduces the meaning of ICTs in education and practices in school education
- b. Provides competence in using ICT tools in classroom teaching and learning
- c. Acquaint to the different learning management system and able to use them in teaching and learning management
- d. Impart brief ideas on the historical development and innovation of ICTs use in the field of education

### 3. Course Outlines

Specific Objectives	Contents
<ul style="list-style-type: none"><li>• Explain the difference of ICT and ICT education in terms of aims, contents and practices.</li><li>• Sketch the historical development of ICT and ICT in education in the world.</li><li>• Describe the policy and practices of ICT in education among different countries.</li><li>• Compare the ICT policy and practice in Nepalese education.</li></ul>	Unit I: ICT and ICT Education(6) <ul style="list-style-type: none"><li>• Meaning of ICT and ICT education</li><li>• The beginning of ICTs in education</li><li>• ICT use in education in different countries a review (some developed and developing countries)</li><li>• ICT in education in Nepal: ICT policy and programs in Nepal (one-laptop per child, virtual schools, ICT integration in courses, Computer courses etc)</li></ul>
<ul style="list-style-type: none"><li>• Explain a relation between theories of learning and use of ICT in teaching different</li></ul>	Unit 2: Learning theories and educational software/ICT tools (6) <ul style="list-style-type: none"><li>• Behaviourism, cognitivism and constructivism in students' learning and in developing educational</li></ul>

<p>subjects in schools</p> <ul style="list-style-type: none"> <li>Describe the implication of learning theories in making different educational software and tools that are used in education.</li> <li>Illustrate and explain how ICTs use can enhance actionable, engaged and interactive learning environment.</li> <li>Examine the position of traditional learning theories in relation to theories of networking of learning.</li> </ul>	<p>software</p> <ul style="list-style-type: none"> <li>ICT use for actionable, engaged and interactive learning</li> <li>Learning through networking - alternative view of learning</li> </ul>
<ul style="list-style-type: none"> <li>State the inclusion of ICTs in school curriculum in different subjects.</li> <li>Explain the needs of ICT competencies for a teachers based on different professional standards</li> </ul>	<p>Unit 3: ICTs in Curriculum and Professional Standards (4 )</p> <ul style="list-style-type: none"> <li>Review of the curriculum framework and professional standards of teachers in relation to ICT use for different subjects</li> <li>ICT competencies in different professional standards (eg UNESCO, OECD, EU) and NCED Nepal.</li> </ul>
<ul style="list-style-type: none"> <li>To enhanced the skill to operate the operating system</li> <li>To handle ICT devices and use them in learning facilitation</li> <li>To handle the mobile computing devices and applications.</li> </ul>	<p>Unit 4: Operation of Computer System and Hardware for Professional work(8)</p> <ul style="list-style-type: none"> <li>Working with operating system (Desktop, file and folder management, user account and password protection).</li> <li>Computer hardware and their installation for use (printer, digital camera, scanner, projector, flash drive etc)</li> <li>Use of Mobile computing and Applications</li> </ul>
<ul style="list-style-type: none"> <li>Design power points for different purpose of presentation for different subjects and issues</li> <li>Design spreadsheet as per needs of the tasks</li> <li>Use spreadsheet to enter students' progress scores and compute for analysis and interpretation of the results.</li> <li>Use appropriate software</li> </ul>	<p>Unit 5: Application competency for Teaching learning (26)</p> <ul style="list-style-type: none"> <li>Working with word processor software for teaching learning (Text formatting, page setting, table and object insert, review and citation on documentation)</li> <li>Designing and use of spread sheet for teaching and recording of the students' performance (worksheet and workbook, cell referencing, functions and formula, Inserting charts, Case: Analyze the students' achievement score)</li> <li>Power point designing and use for teaching</li> </ul>

in designing learning materials, lessons and project work/assignment for the students	<p>(Creating presentation, inserting pictures, charts, audio, video, formatting presentation, layout, animation, slide transition)</p> <ul style="list-style-type: none"> <li>• Use of software relevant to particular subject (math, language, science, social study) in preparing presentation and dynamic learning materials</li> </ul>
<ul style="list-style-type: none"> <li>• Create emails and use it for communication using full features in email.</li> <li>• Identify simple connectivity problem of internet and solve or refer to the technical person.</li> <li>• List out the useful e-resources and database for school education and more.</li> <li>• Use ICT gadgets for creating contents for learning (audio, video, text etc)</li> <li>• Use of multimedia in teaching and learning</li> </ul>	<p>Unit 6: Communication tools, multi-media and their use in teaching and learning (20 )</p> <ul style="list-style-type: none"> <li>• Use of Internet and email</li> <li>• Search engine and social media</li> <li>• Use of cloud computing tools to share documents (eg google drive, skype etc)</li> <li>• Searching database and e-resources available freely in online and school system database.</li> <li>• Proper use of e-resources for enhancing professional capacity and for students' learning</li> <li>• Educational Mobile Application</li> <li>• Recording Audio, Video,</li> <li>• Create Video Clips, movie maker-Software, simple video editing</li> <li>• Multimedia and its use (text, image, animation, audio and video) in teaching and learning</li> </ul>
<p>Explain the cyber security laws and issues</p> <p>Use ICTs with full ethical consideration</p> <p>Create awareness programme for students in security, ethics and use and misuse of ICTs</p>	<p>Unit 7: Security and Ethical Consideration in ICT use(6 )</p> <ul style="list-style-type: none"> <li>• Computer protection form virus</li> <li>• Cyber security and Cyber Crime</li> <li>• Ethics in using digital documents, ICT use and communication</li> <li>• Use and misuse of ICTs</li> </ul>
<p>Design and present ICT based projects appropriate for students in different subjects in school education</p> <p>Conduct seminar on the basis of the projects</p>	<p>Unit 8: Project Work on Using ICTs(4 )</p> <p>Students from the respective fields of their specialization will work on projects assigned by the course teacher (both individual and group project). Each student need to involve in at least 10 projects.</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 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 and production of workshop are essential instructional technique for all units in this course during teaching learning process. Specifically, The units 4 , 5 , 6 , 7 are for practical workshop sessions in ICT laboratory. The products created through the workshop will be demonstrated through seminars and presentation in class. The other units will need lecture, discussion, demonstration, small assignments for writing essays etc.

## 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) Terminal Examination  | 10 Points |

5.2	Total	40 points
Se me ster 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.

Course Title: **Web Technology**

Course No. : ICT. Ed. 437

Level: B.Ed.

Semester: Third

Nature of course: Theoretical + Practical

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

Teaching Hour: 80hours (32+48)

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### 1. Course Description

The aim of the course is to help students gain knowledge in the basic concepts of web development and build skills to develop web based application using the web tools, scripting and server side language. The goal of course is to provide application developers easy and complete understanding design of web page and integrated with MySQL and PHP which are most popular open source technologies.

### 2. General Objectives

After the completion of this course, the students should be able to:-

- To gain an understanding of the theories and concepts underlying web development
- To gain the skill of HTML structures and functionality.
- To develop the web based application with client side control mechanism
- To build skill to mapping of web design structure to coding using CSS
- To develop web application with server site scripting language.

### 3. Course Outlines:

Specific Objectives	Contents	
<ul style="list-style-type: none"><li>• Describe the concept of Hyper text and Markup language concept</li><li>• Working with HTML basic tag for Text formatting, Listing, Hyper link, Image, Table, Form and Frame with properties and values</li></ul>	<b>Unit 1: Introduction to HTML</b> 1.1 Concept of WWW 1.2 Component of www and URL 1.3 HTML editors (Dreamweaver, Notepad ++, Edit Plus) 1.4 Basic HTML construct, building blocks 1.5 Working with Fonts and Formats 1.6 Working with Lists and Links 1.7 Working with Images 1.8 Working with Tables 1.9 Working with Div 1.10 Working with Forms and Frames	<b>12</b>
<ul style="list-style-type: none"><li>• Explore the different levels and abilities of style sheets.</li><li>• Apply the CSS for designing in HTML basic structure</li></ul>	<b>Unit 2: Cascading Style Sheet</b> 2.1 Web page and CSS 2.2 CSS implementation 2.3 Basic Elements of CSS Design 2.4 CSS Building Blocks 2.5 Text properties 2.6 Colors, backgrounds and images 2.7 Lists and Links 2.8 Basic Design of layout 2.9 Types of layouts 2.10 CSS Responsive	<b>12</b>
<ul style="list-style-type: none"><li>• Explain basic client-side scripting structure</li><li>• Integrate JavaScript within HTML documents</li><li>• Build interactive site components</li></ul>	<b>Unit 3: JavaScript</b> 3.1 Java Script Overviews 3.2 Java Script and WWW 3.3 Java Script elements 3.4 Functions 3.5 Variables and Expressions 3.6 Statements; if, for, while 3.7 Array	<b>15</b>

<ul style="list-style-type: none"> <li>Apply existing contemporary UI components</li> </ul>	3.8 Events handlers 3.9 Objects and Events 3.10 Getting data from Form and form validation 3.11 Concept of JQUERY	
<ul style="list-style-type: none"> <li>Explain the basic concept of dynamic and statics WWW</li> <li>Configure the web development tools</li> <li>Configure the web server properties and values.</li> <li>Configure the basic file of PHP scripting language.</li> </ul>	<b>Unit 4: Introduction to PHP, MYSQL and APACHE</b> 4.1 Introduction of Static and Dynamic Website 4.2 Concept of Server Side Scripting Language and Web Server 4.3 Introduction of Apache, PHP, MySQL 4.4 Introduction to WAMP 4.5 Installing Apache, PHP, MySQL 4.6 Apache Version and installation 4.7 Apache configuration file structure 4.8 Apache Log file 4.9 Apache related commands 4.10 Troubleshooting in Apache Server 4.11 Installation and Configuration of PHP 4.12 php.ini basic 4.13 Basic PHP Scripts 4.14 Integrating PHP with HTML	12
<ul style="list-style-type: none"> <li>Describe the basic structure of PHP scripting language</li> <li>Demonstrate the control structure, function, array and string use in programming</li> </ul>	<b>Unit 5: Programming Structure of PHP</b> 5.1 Data types, Variables, Operators and Expression 5.2 Flow Control in PHP: if statement, switch statement, ? Operator, loops 5.3 Code block and Browser output 5.4 Working with functions: Define and Call Function 5.5 Returning Value from user define function 5.6 Scope of Variable 5.7 Setting Default Value for arguments, passing value reference to function 5.8 Create an Array 5.9 Create an Object 5.10 Working with String, Date and Time 5.11 String Manipulation	12
<ul style="list-style-type: none"> <li>Design form for capture and retrieve the inform from client to server</li> </ul>	<b>Unit 6: Working With Form</b> 6.1 Creating a user Form 6.2 Hidden filed for save state 6.3 Redirecting user 6.4 Sending mail on form submission 6.5 Working with file uploading 6.6 Working with Session	8
<ul style="list-style-type: none"> <li>Demonstrate the database connectivity.</li> <li>Explain the AJAX concept</li> <li>Describe the Captcha</li> </ul>	<b>Unit 7: MySQL and PHP</b> 7.1 Connecting to MySQL with PHP 7.2 Introduction of database 7.3 Working with MySQL Data 7.4 File Uploading & Emails 7.5 Making a Contact Us Form on a website 7.6 PHP and AJAX 7.7 Creating Images on the Fly 7.8 Image Captcha 7.9 Restrict Viewing on the website	12
<ul style="list-style-type: none"> <li>Create live project using web development tools</li> </ul>	<b>Unit 8: Project Work</b>	5

#### 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: Introduction to HTML	<ul style="list-style-type: none"><li>• Selection of HTML editors</li><li>• Design Web page to describe web skeleton</li><li>• Demonstrate Text formatting</li><li>• Create list and insert image</li><li>• Create hyper link</li><li>• Create table with properties</li><li>• Create Form with properties</li></ul>
Unit 2: Cascading Style Sheet	<ul style="list-style-type: none"><li>• User CSS elements in inline CSS</li><li>• User CSS elements in embedded CSS</li><li>• User CSS elements in external CSS</li><li>• Design Text formatting</li><li>• Design Layouts</li></ul>
Unit 3: JavaScript	<ul style="list-style-type: none"><li>• Demonstrate data types and variables</li><li>• Use function to accept the information</li><li>• Demonstrate control structure</li><li>• Apply Array</li><li>• Demon different types of events handling</li><li>• Design and develop form to validation of data</li><li>• Apply basic structure of JQUARY</li></ul>
Unit 4: Installation and configuration of Apache, PHP and MySQL	<ul style="list-style-type: none"><li>• Install PHP and MySQL</li><li>• Install Apache server</li><li>• Configure the apache server</li><li>• Configure the PHP file</li><li>• Integrate the PHP and HTML</li></ul>
Unit 5-6: Programming in PHP and form control	<ul style="list-style-type: none"><li>• Apply the control structure of PHP</li><li>• Create function and pass the values</li><li>• Create array and objects</li><li>• Implement the build in string function</li><li>• Design form to capture different types of values</li><li>• Design form to sent mail</li><li>• Upload file</li><li>• Create session</li></ul>
Unit 7: PHP and Database	<ul style="list-style-type: none"><li>• Create a database connection class</li><li>• Insert, update, delete data through PHP form</li><li>• Implement the AJAX</li><li>• Use the captcha</li></ul>

Unit 8: Project	<ul style="list-style-type: none"> <li>Develop web application using HTML, CSS, JavaScript, PHP and MySQL.</li> </ul>
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## 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) Terminal Examination   | 10 Points |

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5.2	Total	40 points
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### Semester Examination (40 Points)

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

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

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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 (including relevant published articles in national and international journals)

### Recommended books:

Felke-Morris, T. (2013). Web development and design foundations with HTML5 (6<sup>th</sup> ed). New Delhi : Pearson.

Lemay, L. (2016). *Sams teach yourself HTML, CSS & Javascript web publishing in one hour a day*

(Seventh edition). Sams India.

MacCaw, A. (2011). Java Script web applications: Alex MacCaw. O'Reilly.

Meloni Julie C(2010)., *Teach Yourself PHP, MySQL and Apache*, New Delhi, Pearson Education Pvt. Ltd. Delhi

Holzner, Steven(2008), *PHP : the complete reference*, New Delhi ,Tata McGraw-Hill

### References materials:

Nixon, R. (2014). Learning PHP, MySQL & JavaScript: with jQuery, CSS & HTML5 (Fourth edition).

Sebastopol, CA: O'Reilly Media, Inc.



Course Title: **Microprocessor & Computer Organization**

Course No. : ICT. Ed. 436

Level: B.Ed.

Semester: Third

Nature of course: Theoretical + Practical

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

Teaching Hour: 80hours (32+48)

### 1. **Course Description**

This course is an introduction to microprocessor & computer organization. It covers topics in 8086 microprocessors and the physical design of the computer (i.e. computer organization). This course discusses the basic structure of a digital computer, microprocessor and deals with the detail study of the 8086 microprocessor programming and organization of the Control unit, the Arithmetic and Logical unit, the Memory unit and the I/O unit.

### 2. **General Objectives**

The general objectives of this course are as follows:

- To provide the students with the knowledge of microprocessor and assembly language programming
- To provide the organization and designing concept of computer system including processor, computer arithmetic, memory organization and I/O organization.
- To discuss in detail, the operation of the arithmetic unit including the algorithms & implementation of fixed-point and floating-point addition, subtraction, multiplication & division.
- To study the cache memories and virtual memory.
- To study the different ways of communicating with I/O devices and standard I/O interfaces

### 3. **Course Outlines:**

Specific Objectives	Contents
<ul style="list-style-type: none"><li>• Explain the block diagram of a computer, history of microprocessors and organization of microprocessor based system.</li><li>• Understand bus organization, Von Neumann architecture and stored program concept.</li><li>• Explain basic of SSI, MSI, LSI and VLSI circuits</li></ul>	<b>Unit 1: Introduction (8)</b> <ul style="list-style-type: none"><li>1.1 Introduction and History of Microprocessors</li><li>1.2 Basic Block Diagram of a Computer</li><li>1.3 Organization of Microprocessor Based System</li><li>1.4 Bus Organization</li><li>1.5 Stored program Concept and Von Neumann Machine</li><li>1.6 Processing Cycle of a Stored Program Computer</li><li>1.7 SSI, MSI, LSI circuits</li><li>1.8 VLSI Technology</li><li>1.9 Introduction to Register Transfer Language</li></ul>
<ul style="list-style-type: none"><li>• Explain the Internal Architecture and Features of 8086 Microprocessor</li><li>• Discuss different Addressing Modes of 8086 with examples</li><li>• Differentiate between High Level versus Low Level Programming</li><li>• Learn different Assembly Language Syntax, EXE and COM programs.</li><li>• Understand how to assemble, link and execute assembly language program</li></ul>	<b>Unit 2: Programming with 8086 Microprocessor (24)</b> <ul style="list-style-type: none"><li>2.1 Internal Architecture and Features of 8086 Microprocessor<ul style="list-style-type: none"><li>2.1.1 BIU and Components</li><li>2.1.2 EU and Components</li><li>2.1.3 EU and BIU Operations</li><li>2.1.4 Segment and Offset Address</li></ul></li><li>2.2 Addressing Modes of 8086</li><li>2.3 Assembly Language Programming</li><li>2.4 High Level versus Low Level Programming</li><li>2.5 Assembly Language Syntax<ul style="list-style-type: none"><li>2.5.1 Comments</li><li>2.5.2 Reserved words</li><li>2.5.3 Identifiers</li><li>2.5.4 Statements</li><li>2.5.5 Directives</li></ul></li></ul>

<ul style="list-style-type: none"> <li>• Create different 8086 programs and execute them.</li> <li>• Explain Pin Configuration of 8086 and the Bus Structure along with the Read and Write Bus Timing of 8086 Microprocessors.</li> </ul>	<div> <div>2.5.6 Operators</div> <div>2.5.7 Instructions</div> <div>2.6 EXE and COM programs</div> <div>2.7 Assembling, Linking and Executing</div> <div>2.8 One Pass and Two Pass Assemblers</div> <div>2.9 Keyboard and Video Services</div> <div>2.10 Various Programs in 8086</div> <div>2.10.1 Simple Programs for Arithmetic, Logical, String Input/Output</div> <div>2.10.2 Conditions and Loops</div> <div>2.10.3 Array and String Processing</div> <div>2.10.4 Read and Display ASCII and Decimal Numbers</div> <div>2.10.5 Displaying Numbers in Binary and Hexadecimal Formats.</div> <div>2.11 Pin Configuration of 8086 Microprocessors</div> <div>2.12 Bus Structure</div> <div>2.12.1 Synchronous Bus</div> <div>2.12.2 Asynchronous Bus</div> <div>2.12.3 Read and Write Bus Timing of 8086 Microprocessors</div> </div> <div> <b>Practical Works:</b> <ul style="list-style-type: none"> <li>• Install the compiler for 8086 assembly language (MASM)</li> <li>• Learn how to assemble, link and execute the simple 8086 program.</li> <li>• Write a simple program to understand and learn the arithmetic, logical, String, Input/Output operations.</li> <li>• Write a simple program to understand and learn conditions and looping instructions in 8086 microprocessors.</li> <li>• Write a simple program to understand and learn Array and String Processing</li> <li>• Write a simple program to Read and Display ASCII and Decimal Numbers</li> <li>• Write a simple program to display numbers in Binary and Hexadecimal Formats.</li> </ul> </div>
<ul style="list-style-type: none"> <li>• Explain CPU Structure and Function, Arithmetic and Logic unit, instruction sets, addressing modes and formats.</li> <li>• Understand processor and register organization, addressing modes, data transfer and manipulation</li> <li>• Differentiate between RISC and CISC</li> <li>• Describe 64-bit Processor</li> </ul>	<div> <b>Unit 3: Central Processing unit (10)</b> <div>3.1 CPU Structure and Function</div> <div>3.2 Arithmetic and logic Unit</div> <div>3.3 Stack</div> <div>3.4 Processor organization</div> <div>3.5 Register organization</div> <div>3.6 Instruction formats</div> <div>3.7 Addressing modes</div> <div>3.8 Data transfer and manipulation</div> <div>3.9 RISC and CISC</div> <div>3.10 64-Bit Processor</div> </div>
<ul style="list-style-type: none"> <li>• Describe Control Memory, Addressing Sequencing and Computer Configuration</li> <li>• Understand Microinstructions format, symbolic Microinstructions, Symbolic Micro Program.</li> </ul>	<div> <b>Unit 4: Control Unit (10)</b> <div>4.1 Control Memory</div> <div>4.2 Addressing sequencing</div> <div>4.3 Computer configuration</div> <div>4.4 Microinstruction Format</div> <div>4.5 Symbolic Microinstructions</div> <div>4.6 Symbolic Micro program</div> </div>

<ul style="list-style-type: none"> <li>Explain design and operation of the control unit.</li> </ul>	4.7 Control Unit Operation 4.8 Design of control unit
<ul style="list-style-type: none"> <li>Explain addition, subtraction, multiplication and division algorithms.</li> <li>Elaborate different logical operations</li> </ul>	<b>Unit 5: Computer Arithmetic (8)</b> 5.1 Addition Algorithm 5.2 Subtraction Algorithm 5.3 Multiplication Algorithm 5.4 Division Algorithm 5.5 Logical Operations. <b><u>Practical Works:</u></b> <ul style="list-style-type: none"> <li>Write a program to demonstrate the Addition of two unsigned integers binary number</li> <li>Write a program to demonstrate multiplication of two unsigned integer binary numbers by Partial-Product method</li> <li>Write a program to demonstrate the Subtraction of two unsigned integers binary number</li> <li>Write a program to demonstrate the Division using restoring</li> <li>Write a program to demonstrate the Division using non-restoring methods</li> </ul>
<ul style="list-style-type: none"> <li>Explain the peripheral devices, I/O modules and interface</li> <li>Elaborate programmed I/O, Interrupt driven I/O direct memory access and data communication processors.</li> </ul>	<b>Unit 6: Input/Output Organizations (8)</b> 6.1 Peripheral devices 6.2 I/O modules 6.3 Input-output interface 6.4 Modes of transfer 6.5 Programmed I/O 6.6 Interrupt-driven I/O 6.7 Direct Memory access 6.8 Data Communication processor
<ul style="list-style-type: none"> <li>Explain the organization of main, auxiliary, associative, virtual and cache memory.</li> <li>Elaborate on cache memory driving forces and cache design issues including placement, fetch, replacement and update policies</li> </ul>	<b>Unit 7: Memory Organizations (6)</b> 7.1 Microcomputer Memory 7.2 Characteristics of memory systems 7.3 The Memory Hierarchy 7.4 Internal and External memory 7.5 Cache memory principles 7.6 Elements of Cache design 7.6.1 Cache size 7.6.2 Mapping function 7.6.3 Replacement algorithm 7.6.4 Write policy 7.6.5 Number of caches <b><u>Practical Works:</u></b> Simulate a direct mapping cache.
<ul style="list-style-type: none"> <li>Create an application using Assembly Language Program.</li> <li>Develop a project on Computer Architecture</li> </ul>	<b>Unit 8: Project (6)</b> 8.1 The student should develop a simple application using 8086 Assembly Language Program. 8.2 The student should develop a project on computer Architecture. The topic could be either initiated by the student or selected from a list provided by the instructor. An oral presentation with a demonstration should be part of the laboratory project report

#### 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:

##### Unit 1, 3, 4 and 6

- Lecture
- Discussion

##### Unit 2, 5, 7 and 8

- Lecture
- Discussion
- Practical

#### 5. Evaluation :

Internal Assessment	External Practical Exam/Viva	Semester Examination	Total Marks
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##### 5.1 Internal Evaluation (40 Points):

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| 3) First assignment ( written assignment)                         | 10 points |
| 4) Second assignment (Case Study/project work with presentation ) | 10 points |
| 5) Terminal Examination   | 10 Points |

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Total

40 points

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##### 5.2 Semester Examination (40 Points)

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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

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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.

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

**Recommended books:**

1. Peter Abel, "IBM PC Assembly Language and Programming", 5th Edition 2001, Pearson Education Inc.
2. W. Stalling, Computer Organization and Architecture 17 edition, Prentice-Hall India Limited, New Delhi.

**References materials:**

1. Walter A. Triebel and Avtar Singh, "The 8088 and 8086 Microprocessors, Programming, Interfacing, Software, Hardware and Applications", 4th Edition 2003, Prentice Hall
2. A.J Vande Goor, Computer Architecture and Design, Addison Wesley; Wokingham, UK, 1989
3. A.S Tanenbaum, Structured Computer Organization, Prentice Hall India Limited, new Delhi.
4. M.Morris Mano: Computer System Architecture, Latest Edition.
5. John P. Hayes: Computer Architecture and Organization, Latest Edition.

**Course Title: Data Structures and Algorithms**

Course No. : ICT. Ed. 435

Nature of course: Theoretical + Practical

Level: B. Ed

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

Semester: Third

Teaching Hour: 80 hours (32+48)

**1. Course Description**

The purpose of this course is to provide the students with solid foundations in the basic concepts of data structures and algorithms. The main objective of the course is to teach the students how to select and design data structures and algorithms that are appropriate for problems that they might occur. This course is also about showing the correctness of algorithms and studying their computational complexities. This course offers the students a mixture of theoretical knowledge and practical experience. Programming language C will be used for practical work.

**2. General Objectives**

The general objectives of this course are as follows:

- To introduce data abstraction and data representation in memory
- To describe, design and use elementary data structures such as stack, queue, linked list, tree and graph
- To decompose complex programming problems into manageable sub-problems
- To introduce algorithms and their complexity

**3. Specific Objectives and Contents**

Specific Objectives	Contents
<ul style="list-style-type: none"><li>• Define Data structure and ADT</li><li>• Implement dynamic memory management functions in C</li><li>• Define algorithms, asymptotic notations and mathematical functions</li></ul>	<b>Unit 1: Introduction to Data Structures &amp; Algorithms(6)</b> 1.1 Data types, Data structure and Abstract data type 1.2 Dynamic memory allocation in C 1.3 Introduction to Algorithms 1.4 Asymptotic notations and common functions <b>Lab:</b> Write a program to implement dynamic memory management functions(malloc(),calloc(),realloc() and free())
<ul style="list-style-type: none"><li>• Define and implement stack and stack operations</li><li>• Convert expressions in to different forms: infix, prefix and postfix</li><li>• Describe the applications of the stack</li></ul>	<b>Unit 2: Stacks (8)</b> 2.1 Definition 2.2 Stack as an ADT 2.3 Stack operation 2.4 Stack application: Conversion from infix to postfix/prefix expression, Evaluation of postfix/prefix expressions <b>Lab:</b> Write a program to implement stack operations
<ul style="list-style-type: none"><li>• Define queue and its operations</li><li>• Implement different types of queue</li><li>• Describe the applications of the queue</li></ul>	<b>Unit 3: Queues (10)</b> 3.1 Definition 3.2 Queue as an ADT 3.3 Primitive operations in queue: Enqueue and Dequeue 3.4 Linear Queue, Circular Queue, Priority Queue. <b>Lab:</b> Write a program to implement linear and circular queue operations
<ul style="list-style-type: none"><li>• Define linked list its type and applications</li></ul>	<b>Unit 4:Lists (12)</b> 4.1 List and ADT

<ul style="list-style-type: none"> <li>Implement linked list operations</li> <li>Implement stack and queue as circular list</li> <li>Describe the applications of the linked list</li> </ul>	4.2 Array Implementation of Lists 4.3 Linked List 4.4 Types of Linked List: Singly Linked List, Doubly Linked List, Circular Linked List. 4.5 Basic operations in Linked List: creation, node insertion and deletion from beginning, end and specified position 4.6 Stack and Queue as a Linked List <b>Lab-1:</b> Write a program to implement singly and doubly linked list operations <b>Lab-2:</b> Write a program to implement stack and queue as linked list
<ul style="list-style-type: none"> <li>Define recursion.</li> <li>Differentiate between recursion and iteration</li> <li>Implement recursion to solve TOH and Fibonacci series</li> <li>Identify the applications and efficiency of recursion</li> </ul>	<b>Unit 5: Recursion (6)</b> 5.1 Principle of recursion 5.2 Comparison between recursion and iteration 5.3 Factorial, Fibonacci sequence, GCD, Tower of Hanoi(TOH) 5.4 Applications and Efficiency of recursion <b>Lab-1:</b> Write a program to solve the problem of TOH <b>Lab-2:</b> Write a program to print Fibonacci series <b>Lab-3:</b> Write a program to calculate factorial <b>Lab-4:</b> Write a program to calculate gcd of two numbers
<ul style="list-style-type: none"> <li>Define tree and tree operations</li> <li>Create and manipulate Binary tree, BST, AVL tree and B-Tree</li> <li>Implement Huffman algorithm</li> <li>Identify application areas of tree</li> <li>Describe the applications of the tree</li> </ul>	<b>Unit 6: Trees (10)</b> 6.1 Concept and definitions 6.2 Basic operations in binary tree 6.3 Tree height, level and depth 6.4 Binary Search Tree 6.5 Insertion, Deletion, Traversals (pre-order, post-order and in-order ), Search in BST 6.6 AVL tree and Balancing algorithm 6.7 Applications of tree <b>Lab:</b> Write a program to insert, delete, search and display(pre-order, in-order, post-order) items in BST
<ul style="list-style-type: none"> <li>Define sorting and its type</li> <li>Illustrate and implement exchange sort, selection and tree sorting, insertion sort, merge and radix sort.</li> <li>Identify and compare the efficiency of mentioned sorting algorithms</li> </ul>	<b>Unit 7: Sorting (12)</b> 7.1 Introduction and Types of sorting: Internal and External sort 7.2 Comparison Sorting Algorithms: Bubble, Selection and Insertion Sort 7.3 Divide and Conquer Sorting: Merge, Quick and Heap Sort 7.4 Efficiency of Sorting Algorithms <b>Lab:</b> Write a program to implement: a) Bubble sort b) Selection sort c) Insertion sort d) Quick sort e) Merge sort f) Heap sort
<ul style="list-style-type: none"> <li>Identify different searching algorithms and implement them.</li> <li>Identify the efficiency of</li> </ul>	<b>Unit 8: Searching (8)</b> 8.1 Introduction to searching 8.2 Search Algorithms: Sequential search, Binary search

mentioned searching algorithms	8.3 Efficiency of search algorithms 8.4 Hashing : Hash function and hash tables, Collision resolution technique <b>Lab:</b> Write a program to implement: a) Sequential search b) Binary search
<ul style="list-style-type: none"> <li>Define graph, graph terminologies, and graph as a ADT</li> <li>Illustrate transitive closure, Warshall's algorithm and shortest path algorithm</li> <li>Find the shortest path using Dijkstra's Algorithm</li> <li>Explain and implement graph traversal algorithms</li> <li>Define MST and implement prim's, kruskal's and round-robin algorithm</li> <li>Describe the applications of the graph</li> </ul>	<b>Unit 9: Graphs (8)</b> 9.1 Definition and Representation 9.2 Graph Traversal: BFS and DFS 9.3 Minimum Spanning Trees: Kruskal and Prims Algorithm 9.4 Shortest Path Algorithms: Dijkstra's Algorithm <b>Lab:</b> Write a program to implement graph traversal algorithms(BFS and DFS)

#### 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, and problem solving methods 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: Introduction to Data Structures & Algorithms	<ul style="list-style-type: none"> <li>Define and Describe the different types of data structures</li> <li>State different operations occurring in data structures</li> <li>Write a program to implement dynamic memory management functions</li> <li>Explain asymptotic notations and complexity on time and space of algorithm</li> <li>Monitor of students' work by reaching each student and providing feedback for improvement</li> <li>Presentation by students followed by peers' comments and teacher's feedback</li> </ul>
Unit 2: Stacks	<ul style="list-style-type: none"> <li>Illustrate the algorithms of stack operations</li> <li>Lab works in pair to implement stack operations</li> <li>Convert expression in other from one form to another making group and individually</li> </ul>



	<ul style="list-style-type: none"> <li>• Monitoring of students' work by reaching each pair and providing feedback for improvement</li> <li>• Presentation by students followed by peers' comments and teacher's feedback</li> </ul>
Unit 3: Queues	<ul style="list-style-type: none"> <li>• Demonstrate queue and queue operations with algorithms</li> <li>• Lab work in pairs to implement queue operations</li> <li>• Group discussion in advantages and limitations of queues</li> <li>• Monitoring of students' work by reaching each student and providing feedback for improvement</li> <li>• Presentation by students followed by peers' comments and teacher's feedback</li> </ul>
Unit 4: List	<ul style="list-style-type: none"> <li>• Demonstrate operations of linked list with algorithms</li> <li>• Lab work in pairs to implement linked list operations</li> <li>• Monitor students' work by reaching each student and providing feedback for improvement</li> <li>• Presentation by students followed by peers' comments and teacher's feedback</li> </ul>
Unit 6: Trees	<ul style="list-style-type: none"> <li>• Demonstrate operations and types of tree</li> <li>• Lab work in pairs to implement BST</li> <li>• Trace a working principle of AVL and B-Tree</li> <li>• Assign students to create AVL and B-Tree in group</li> <li>• Monitor students' work by reaching each student and providing feedback for improvement</li> <li>• Presentation by students followed by peers' comments and teacher's feedback</li> </ul>
Unit 7: Sorting	<ul style="list-style-type: none"> <li>• Trace the working principle of different sorting algorithms</li> <li>• Lab work in pair to implement sorting algorithms</li> <li>• Analyze efficiency of sorting algorithms</li> <li>• Monitor students' work by reaching each student and providing feedback for improvement</li> <li>• Presentation by students followed by peers' comments and teacher's feedback</li> </ul>
Unit 8: Searching and Hashing	<ul style="list-style-type: none"> <li>• Demonstrate the working principle of different searching algorithms</li> <li>• Lab work in pair to implement searching algorithms</li> <li>• Analyze efficiency of searching algorithms</li> <li>• Monitor students' work by reaching each student and providing feedback for improvement</li> <li>• Presentation by students followed by peers' comments and teacher's feedback</li> </ul>
Unit 9: Graphs	<ul style="list-style-type: none"> <li>• Explain the graph and graph terminology</li> <li>• Solve the practical problems of shortest path and spanning tree using different algorithms</li> <li>• Assign student to solve graph problems</li> <li>• Lab work in pair to implement graph traversing algorithms</li> <li>• Monitor students' work by reaching each student and providing feedback for improvement</li> <li>• Presentation by students followed by peers' comments and teacher's feedback</li> </ul>

## 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) Terminal Examination   | 10 Points |

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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 |

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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.

## Recommended Books and References

### Recommended Books

- 1 G. S. Baluja, “Data structure Through C, A Practical Approach”, Fourth Ed. Dhanpat Rai & Co., 2009-10.
- 2 Y Langsam , MJ , Augenstein and A.M , Tanenbaum Data Structures using C and C++ , Prentice Hall India.

### References

- 3 G.W Rowe, Introduction to Data Structure and Algorithms with C and C++ , prentice Hall India.
- 4 T.H Corman, C.E Leiserson, R.L Rivest, C Stein, Introduction to Algorithms, 3<sup>rd</sup> Ed, The MIT Press Cambridge, Massachusetts London, England,2010
- 5 R.L Kruse, B.P. Leung, C.L. Tondo, data structure and program Design in C Prentice-Hall India.
- 6 G. Brassard and P. Bratley fundamentals of Algorithms, Prentice-Hall India.

Course Title : Calculus  
 Course No. : Math Ed. 431  
 Level : B Ed (Minor)  
 Semester : Third

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

### 1. Course Description

The calculus is at the same time a beginning as well as a complete package course. It is the course where many of the ideas and techniques learned in the secondary mathematics are pulled together and answered in a satisfactory way. It is also the foundation for the study of the natural and social sciences. So, this is an introduction course that provides a basic knowledge of calculus and its application. It provides a framework for modeling system. The concepts differentiation and integration in simple standard forms are applied as early as possible to the determination of maxima and minima, of the areas and length of curve, of volume of revolution, to the solution of the day to day problems.

### 2. The General Objectives

The general objectives of this course are as follows:

- To familiarize students with techniques, principles and application of differential calculus.
- To make students capable in applying the differential calculus to solve the problems of other branches of mathematics (natural and social sciences).
- To make students efficient in applying the differential calculus to solve the problems of maxima and minima.
- To make students trained in using the differential calculus for study the properties of tangents and normal of a curve (Cartesian curve only).
- To enhance the skills of students in demonstrating an understanding of techniques, and application of integral calculus.
- To make students competent in applying integral calculus to evaluate the area, length of plane curve and volume of solid of revolution.
- To develop skills of students on writing differential equation as alternative form to the different types of family of curves.
- To make students able in applying differential equations to solve physical problems.

### 3. Specific Objectives and Contents

On completion of this course students should be able to:

Specific Objectives	Content
<ul style="list-style-type: none"> <li>• Define limit and continuity of a function</li> <li>• Find limits of functions</li> <li>• Test the continuity of functions.</li> </ul>	<b>Unit 1: Limits and Continuity (5)</b> 1.1 Use $\varepsilon$ - $\delta$ in finding limit 1.2 Left hand limit and right hand limit 1.3 Continuity of a function: Meaning of continuity
<ul style="list-style-type: none"> <li>• Define differentiation.</li> <li>• Find the differential coefficient of some specific function</li> <li>• Explain the meaning of successive differentiation.</li> <li>• Find the derivatives of some</li> </ul>	<b>Unit II: Derivatives (8)</b> 2.1 Differentiation of implicit and explicit function, trigonometric, logarithmic, exponential, and parametric function. 2.2 Definition and notation of derivative of function, of order greater than one.

specific functions up to 4 <sup>th</sup> order. • Find the partial derivatives of two independent variables.	2.3 Differentiation of some specific functions up to 4 <sup>th</sup> order. 2.4 Partial derivatives of the functions of type $u = f(x, y)$
• Find equation of tangent and normal at any point of a Cartesian curve. • Find angle between two curves. • Find the length of tangent, normal, subtangent, and subnormal (in Cartesian form).	<b>Unit III: Tangent and Normal (5)</b> 3.1 Equation of tangent and normal 3.2 Problems on tangent and normal 3.3 Angle of intersection of two curves (Cartesian only) 3.4 Problems on Length of tangent, normal, subtangent and sub-normal
• Explain maxima and minima of a function. • Apply rules of maxima and minima to find extreme values of a function. • Solve some verbal problems on maxima and minima (relating to the daily life).	<b>Unit IV: Maxima and Minima (4)</b> 4.1 Meaning of Maxima and minima 4.1.1 Global Maxima/minima 4.1.2 Local Maxima/minima 4.1.3 Stationary and Saddle points 4.2 Application of necessary and sufficient condition of determining extreme values 4.3 Problems on maxima and minima including some behavioral problems
• Integrate different types of functions (by different methods). • Apply standard integrals in solving problems	<b>Unit V: Indefinite Integral (4)</b> 5.1 Meaning of integration 5.2 Some standard Integrals
• Define integration as the limit of a sum. • Explain the meaning of $\int f(x)dx$ • Solve problems of definite integral using definition. • Find the area of plane regions using definite integral.	<b>Unit VI: Definite Integral (6)</b> 6.1 Integration as the limit of a sum 6.2 Meaning of $\int f(x)dx$ 6.3 Properties of definite integral. 6.4 Problems on finding definite integral 6.5 Area of plane regions
• Calculate the area of plane region. • Calculate the arc length of plane curve. • Calculate volume of solids of revolution.	<b>Unit VII: Quadrature, Rectification and Volume (7)</b> 7.1 Introduction 7.2 Application of definite integral in Cartesian form only 7.2.1 Area 7.2.2 Length 7.2.3 Volume
• Form the family of curves in terms of differential equations. • Solve equation of first order and first degree linear homogeneous	<b>Unit 8: Differential Equations</b> 8.1 Definitions (Order and degree) 8.2 Concepts of ordinary differential equation. 8.3 General and particular solution

equations.	8.4 Change of variables 8.5 Homogeneous equations 8.6 Equations reducible to homogeneous form 8.7 Linear Differential equations of first order 8.8 Exact equation 8.9 Equation reducible to linear form 8.10 Application of differential equations
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#### 4. Instructional Techniques

##### 4.1 General Instructional Techniques

Heavy discussion should take place on the issue that students have been told throughout the secondary level. There are many paradoxical instances at secondary level not dealt clearly at good length. Students should be engaged in that you will find the reason why things work the way they do, what they mean and when they are to be used. Listening to students led naturally to even more changes in instruction. So, discussion, lectures, project work will be general instructional technique of delivery of course.

##### 4.2 Specific Instructional Technique

Unit	Activity and Instructional Techniques	Teaching Hours (48)
1	Experiences will be shared between groups with a seminar	5
2	The Demonstration method will be used both giving task to students and showing their task	8
3	Project assignment on some theorems	5
4	Group discussion with sharing	4
5	Guided Discussion	4
6	Group discussion with sharing	5
7	Group discussion with sharing	7
8	Group discussion with sharing	10

#### 5. Evaluation

##### 5.1 Internal Evaluation 40%

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

1) Attendance	4 points
2) Participation in learning activities	6 points
3) First assignment/Mid-term exam	10 points
4) Second assignment/assignment ( 1 or 2)	10 points
Total	30 points

**5.2 External Evaluation (Final Examination) 60%**

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

1) Objective Type Question (Multiple Choice $10 \times 1$ )	10 points
2) Short Answer Question (6 Question $\times$ 5 points )	30 points
3) Long Answer Question (2 Question $\times$ 10 points )	20 points
Total	60 points

**6. Recommended Book and references****Recommended Book**

Das, B. C. ; & Mukharjee, B. (1984) Differential Calculus. Calcutta: U N Dhur and Sons Pvt Ltd.

**Reference Books**

Maskey, S. M. (2008). Calculus. Kathmandu: Ratna Pustak Bhandar.

Narayan, S. (1998). Differential calculus. Delhi: Shyam Lal Chan

Course title: **Developmental Psychology**

Course No. : Ed 332

Level: B.Ed.

Semester: Third

Nature of Course: Theoretical

Credit Hours: 3

Teaching hours: 48

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### **1. Introduction**

This course deals with human growth and development. In general, with an aim to provide students with concept, knowledge and understanding about child growth and development, the course particularly focuses on characteristics, developmental tasks and hazards for educational implication. In particular, this course provides students with specific concept, knowledge and understanding about the puberty and adolescence. Specifically, the characteristics, developmental tasks, spurt of growth and development, social, mental and emotional developments, happiness and unhappiness during puberty and adolescence. With the deep understanding about puberty and adolescence, the course aims to seek out their educational implication.

### **2. General Objectives**

The general objective of the course is

- to provide students with general understanding about babyhood, early and late childhood, adulthood and their characteristics, and developmental task, as well as their educational implication.
- to make students familiar with puberty and adolescence since this course intends to equip students with broader concept, knowledge, attitudes and understanding on the puberty and adolescence.
- to make students able to unveil contextual problems caused by adolescents, and suggests some remedies in line with the nature of problems, and also discusses the issues in terms adolescents' all round development.

### **3. Specific Objectives and Contents**

<b>Specific Objectives</b>	<b>Contents</b>
<ul style="list-style-type: none"><li>• To make student acquaint with growth and development.</li><li>• To facilitate them to grasp the major determinant of growth and development.</li><li>• To inspire them seek out the reasons as to why there is a need for studying human growth and development</li><li>• To acquaint student with major</li></ul>	<p><b>Unit I: Human growth and development. (10 hrs.)</b></p> <p>1.1. Concept and meaning of human growth and development.</p> <p>1.2. Determinants of human growth and development</p> <p>1.3. Need for studying human growth and development in education.</p> <p>1.4. Major methods of studying human growth development.</p> <p>1.4.1. Cross-sectional, longitudinal, and case study</p>

methods of studying human growth and development	1.5. Major issues in development 1.5.1. Nature vs. nurture 1.5.2. Stability vs. change 1.5.3. Continuity vs. discontinuity
<ul style="list-style-type: none"> <li>To make students list out the stages of human growth and development.</li> <li>To familiar them with developmental characteristics and tasks.</li> <li>To enable them to discuss the potent hazards of all developmental stages.</li> </ul>	<b>Unit II: Developmental stages and characteristics (8)</b> 1.6. Infancy and Babyhood: characteristics, developmental tasks and hazards. 1.7. Early and late childhood: characteristics, developmental tasks and hazards. 1.8. Puberty and adolescence: characteristics and developmental tasks 1.9. Adulthood (early, middle and late): characteristics and hazards.
<ul style="list-style-type: none"> <li>To make students able to broaden the knowledge and understanding on puberty.</li> <li>To make them familiar with developmental task, skills, hobby and point out the potent hazards.</li> <li>to make students with criteria, causes and effects of puberty.</li> <li>To acquaint them with physical, mental, and emotional characteristics of puberty.</li> <li>To enable them to find out educational implication for enhancing learning.</li> </ul>	<b>Unit III: Understanding puberty (10)</b> 3.1 Developmental tasks, skills, hobby and possible hazards. 3.2 Causes, criteria and effects of puberty 3.3 Physical development: Spurt of growth during puberty. 3.4 Social development, entertainment and recreation. 3.5 Emotional development and its effects 3.6 Happiness and unhappiness during puberty 3.7 Ways of controlling unhappiness. 3.8 Educational Implication.
<ul style="list-style-type: none"> <li>To enable students develop a wider perspective on adolescence.</li> <li>Make them familiar with developmental task, skills, hobbies, and potent hazards during adolescence.</li> <li>To acquaint them physical, social, emotional, mental, moral characteristics and their educational implication.</li> <li>To be able them to find out the responsible factors for happiness and unhappiness during adolescence.</li> <li>To help students find out the career choice, interest and future</li> </ul>	<b>Unit IV Adolescence and developmental characteristics (10)</b> 4.1 Developmental tasks, skills, hobbies and potent hazards 4.2 Physical characteristics and educational implication. 4.3 Social characteristics, leadership and educational implication. 4.4 Emotional characteristics and educational implication. 4.5 Mental characteristics and educational implication. 4.6 Morality during adolescence and educational implication. 4.7 Happiness and unhappiness during adolescence. 4.8 Career choice, interest and future orientation.



orientation.	
<ul style="list-style-type: none"> <li>To make students aware of the different problems created by adolescents.</li> <li>To facilitate students to develop insights into why adolescents generate the problems.</li> <li>To make them able to draw the educational implications and ways out for the better educational achievement.</li> </ul>	<b>Unit V Adolescence and understanding problems (10)</b> 5.1 Adolescence and drug abuse, alcoholism and effects 5.2 Adolescence and sex, HIV/AIDs, sexually transmitted disease and effects. 5.3 Adolescence and social violence and conflict 5.4 Adolescence: frustration and Suicide 5.5 Ways out: guidance and counseling, psychotherapy, rehabilitation and family adjustment. 5.6 Educational implication

#### 4. 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.

##### 4.1 General Instructional Techniques

- Lecture
- discussion
- Question answer

##### 4.2 Specific Instructional Techniques

Unit	Suggested specific Instructional Techniques
III and IV	Students will be divided into groups and given different topics of III and IV units. Students will visit the schools for group work based on the topics assigned. Groups will prepare report and share in the class. Presentation will be followed by discussion and suggestions.
V	Students will be divided into different groups and assigned to collect issues and problems faced and created by the students at any school. They will prepare the report and present it in the classroom.

#### 5. Evaluation

##### 5.1 Internal Evaluation 40%

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

- |                        |    |
|------------------------|----|
| 1) Attendance          | 5  |
| 2) Class participation | 5  |
| 3) First assignment    | 10 |
| 4) Second assignment   | 10 |
| 5) Third assignment    | 10 |

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Total	40
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## 5.2 Final/Semester Evaluation 60%

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

1) Objective type question (Multiple choice 10 x 1 points)	10
2) Short answer questions (6 questions x 5 points)	30
3) Long answer questions (2 questions x 10 points)	20
<hr/>	
Total	60

## Recommended Books

Baron, R. (2005). *Psychology*. India: Pearson Education.

Chauhan S.S. (1992), *Advance Educational Psychology* Jurjact, Publication, New Delhi, Vikash Publication

Hurlock E.B. ( 2002 ). *Developmental Psychology, A life span approach*. Tata MC Graw Hill Publishing Company Pvt.

Hurlock E.B. (1972), *Child development*, Tata MC Graw Hill

Jersild, A. T., Telfor, C. W., & Sawrey, J.M. (1997). *Child Psychology*. Neew Delhi: Prentice Hall.

Rogers, D. (1972). *The Psychology of Adolescence*. NJ: Appleton-Century-Crofts.

Santrock, J. W. (2007). *Adolescence*. New Delhi: Tata McGraw-Hill Publishing Company LTD

## References

Aryal, P. N. & Bhattarai, D.P. (2009). *Educational Psychology*. Kathmandu: Quest Publication

Battarai, Homnath (2073). *Shikchhya Manobigyan*. Kathmandu: Ratna Pustak,

Bidari, Badri ( ). *Shikchhya Manobigyan*.Kathmandu: Pinakal

Gibson, R.L. & Mitchell, M.H. (2005). *Introduction to counseling, and guidance*.NY: Randow House.

Grace, J. C. (1976). *Developmental Psychology*. India: Pearson Education.

Paudel, Giriraj. ( ). *Shikchhya Manobigyan*. Kathmandu:

Pokhrel, Mohan Mani (2064). *Elementry Educational Psychology*. Kathmandu: Brihaspati Pustak Sadan,

Pokhrel, Mohan Mani (2073). *Child development and learning*. Kathmandu: Gatishil Prakashan,

Pokhrel, Mohanmani (2073), *Shikchhya Monobigyan*. Ashish Book House, Bagbazar, Kathmand