INFORMATION COMMUNICATION TECHNOLOGY (ICT)
CURRICULUM FOR B.ED

1. Course Title: Basic Hardware, Software & C-programming
2. Course No: ICT 312 (IInd paper)
3. Nature of the course: Theory 75% +Practical 25%
Total number of working periods 150 per year.

4. Full Mark: 100
5. Pass Mark: 35 (27+10)
6. Periods Per week: 6+3
[Note: 1 Period = 50 min]

COURSE DESCRIPTION:-

This is a very basic and foundation course of the computer system. This course contains the digital logic, microprocessor, computer operating system and C-Programming language. C is the very basic and powerful programming language. It is a structural programming language. The concept of this computer language will help students to understand other computer languages easily. Operating system (OS) is a easy software, which is used to communicate between computer system and computer user. Without this (OS) software computer can not understand what the computer operator wants to perform. In this course students learn the theoretical and basic details of the computer operating system. This paper contains 75% theoretical part and 25% practical part.

OBJICTIVES:-
On the completion of this course the student will be able to:

- apply the basic principles of the digital logical tables.

- define and use the Boolean algebra and its laws.

- define the number system and perform their conversion.

- understand the basic logic etc.

- define the working procedure inside the computer system (i.e. inside a microprocessor).

- Explain the concept of the structural computer programming language and its tools.

- Explain the concept of the computer operating system, its types, its role and principles.

S N	Objectives	Contents	Period	Strategies	Reference	Evaluation
1	- To define the logic functions. - To define Boolean algebra & its laws. - To define the concept of gates. - To use the concept of Venn diagram.	**1. <u>DIGITAL LOGIC:-</u>** - Logic Functions and Boolean Algebra - Digital Logic - Simple features using Boolean Algebra (K Map) - Introductions of truth tables operators & operands - Logic Gates – AND, OR, NOT, NAND, NOR, XOR, AND XNOR – its definition, use, truth table logic symbols - Laws of Boolean Algebra - DeMorgan's Theorem: Statement & Logic - Venn diagram.	20 hr (T+P)	- Theoretical classes. - Practical classes. - Question and answer. - Class discussion.	According to text book	- Oral test. - Writing test. - Practical test. - Class test. - Unit test.
2	- To state the processing steps of the microprocessor. - To describe how the register organization is. - To define the general concepts of the Assembly Language. - To state the addressing steps. - To define the formats. - To describe the general concepts of the Control unit, Memory unit, I/O system and general architecture of the microprocessor.	**2. <u>MICROPROCESSOR:</u>** - Introduction to microprocessor - Types of the microprocessor - Processing Organization - Register Organization - General Assembly Language System - Addressing and Formats - Control unit : Hardware & software control - Memory Organization, types, memory devices, static and dynamic RAM, ROM, EPROM'S, high-speed and optic memory - I/O system: I/O types, I/O processor, Bus system - Architecture: RISC & CISC concept - Introduction to storage system	30 hrs (T+P)	- Theoretical classes. - Practical classes. - Interaction. - Class exercise.	According to text book	- Oral test. - Writing test. - Practical test. - Class test. - Unit test.
3	- To define the general concept of the computer operating system. - To describe the knowledge of the file concept, CPU scheduling concept and allocation. - To differentiate between	**3. <u>OPERATING SYSTEM</u>** - General Introduction to operating system (OS) - Types and function of the OS - Terminologies and services of the OS - File concept - Allocation - CPU scheduling concept - Memory management - Virtual memory - Multiprocessing - Multitasking	12 hr (T)	- Theoretical classes. - Interaction. - Question and answer.	According to text book	- Oral test. - Writing test. - Class test. - Unit test.

2 - Microprocessor and C- Programming 2nd paper on B.Ed. -2009

		multiprocessing and multitasking.	- Translator - Linkers and Multi thread			

4	- To define the general concept of the programming.
	- To write the detail idea about C-programming language.
	- To write, edit and test the self made C-programs.
			4. <u>C-PROGRAMMING</u>
			- Introduction to C-programming language
			- Idea of software and programming
			- Algorithm development, flowchart, pseudo codes, requirement analysis, system design, implementation and execution
			- Review of structured programming principles
			- Data types in C
			- Variables and constants
			- Simple statements and compound statements
			- Structured statements
			- Logical and conditional expressions
			- Arrays type, definitions
			- Functions recursive and non recursive
			- String function & I/O functions
			- Structures and Unions
			- Pointers
			- Bit oriented instructions
			- C-preprocessors, C libraries
			- Error and debugging
			- Syntax.
			- Run time errors and debugging
			- File handling
			- Library functions
			- Overflow/under overflow
			- User Interfaces
			- Introduction to data structure
			- Programming project and software management
			   * Bottom up and top down design
			   * Testing sub programs, test of module boundaries, test of boundary conditions
			   * Documentation – Structure charts & program descriptions sheets
			- Project work on C-programming
				88 hr (T+P)	- Theoretical tests.
					- Class test.
					- Tutorial classes.
					- Practical test.
					- Interactions.
					- Question and answers.
						According to text book	- Oral test.
							- Writing test.
							- Class test.
							- Practical test.
							- Project Work.

Text Book

1.   Kelly and Pohl – *A book on C, Benjamin* Cumminings.

2.   Raja Raman- *Computer Programming in C*- Printice Hall of India Pvt.Ltd.-2007 Publication.

3.   Morris Mano- *Digital logic and Computer Design*- Printice Hall of India Pvt.Ltd.-2007 Publication.

4.   Krishna Kant- *Microprocessor and Microcontroller: Architecture, Progrmming and system Design, (New),*- Printice Hall of India Pvt.Ltd.-2007 Publication.

Reference Books

1.   Hughes C.J.I. Michtom – *Structured Approch to Programming*, Prentice Hall International.

2.   Gurung J.B. Baskata A, Baral DS., Baral D, Niroula R, Dhakal , TP, *A Text Book on Computer Science Part A 2nd Edition,* Bhundipuran Prakashan, Kathmandu.

3.   Baral D.S., Baral D, Ghimire S.K – *The Secretes of C Programming Language*..

4.   E. Balaguruswamy, *Programming in ANSI C*, Second edition, Tata Mc Graw Hill Publishing Company 2000.

5.   Subba B.R. *Computer Programming*, Taleju Prakashan, Kathmandu.

6.   URL:http://en.wikipedia.org/