Purbanchal University

Bachelor of Information Technology (BIT)

Year:I   **Semester:I**

Course Code	Course Title	Credits	Lecture (Hrs.)	Tutorial (Hrs.)	Laboratory (Hrs.)	Total (Hrs.)
BIT101CO	Fundamentals of Information Technology	3	3	1	2	6
BIT102HS	Mathematics-I	3	3	2	-	5
BIT103HS	Technical Communication	3	3	1	-	4
BIT104HS	Society and Ethics in IT	3	3	1	-	4
BIT105CO	Computer programming in C	3	3	1	3	7
BIT106CO	Project-I	2	-	-	3	3
	Total	17	15	6	8	29

Note :- Each semester of BIT program spans over a period of 15 weeks of class work and   one week of internal examinations, such as internal tests, quizzes, and mid-term examination.

Fundamentals of Information Technology
BIT101CO

Year: I Semester: I

Teaching Schedule Hours/Week			Examination Scheme				
Theory	Tutorial	Practical	Internal Assessment		Final		Total
			Theory	Practical	Theory	Practical	
3	1	2	20	50	80	-	150

Course Objective: The main objective of this course is to provide basic knowledge of IT and its components, and their applications in various fields.

Course Contents:

Unit 1: Introduction to Computer (4 Hrs)
Characteristics and components of computer, History and generation of computers, Classification of computer based on purpose, size and technology; Applications of Computers - Computer in business and Industry, Computers in home, Computer in education and training, Computers in entertainment, science, medicine and engineering.

Unit 2: Basic Computer Organization and Computer Peripherals (4 Hrs)
Block diagram of computer system; Input devices: Keyboard, mouse, and other types of input devices; Output devices: Monitor, printer, and other types of output devices.

Unit 3: Computer Storage (4 Hrs)
Concepts of memory and requirements of storage devices; Classification and types of storage devices; ROM and RAM with their types; Magnetic devices and Optical devices.

Unit 4: Computer Software (4 Hrs)
Introduction and types of software; Definition and functions and types of operating system; Programming languages and their types.

Unit 5: Introduction to Database (4 Hrs)
Meaning of data and information; Concepts and characteristics of database and DBMS; Database Models; Data Warehouse & Data Marts, Data Mining; On-Line Analytical Processing (OLAP).

Unit 6: Networks and Internet (10 Hrs)
Introduction to communication system and computer network; Uses of computer network; Types and topologies of network; Network media and network software; Introduction, features and applications of Internet; Intranet and extranet; World Wide Web, E-mail, E-commerce, E-Learning, E-Governance, E-Banking; Introduction to Network Protocols (TCP/IP, HTTP, HTTPs, FTP, SMTP, POP3, IMAP).

Unit 7: Information Security (2 Hrs)
Introduction to Information Security; Computer crime, viruses and threats; Cyber law and ethical issues.

Unit 8: Computer Hardware (7 Hrs)

Motherboard and its parts, slots, daughterboard, and expansion slots; BIOS, SMPS, CMOS, and Microprocessors.

Unit 9: Technological trends in Information Technology (6 Hrs.)

Cloud Computing, Artificial Intelligence, BIG Data, IoT, Robotics, Virtual Reality, Augmented Reality, Blockchain Technologies.

Laboratory Works:

1. Basics of Windows and User Interface
— Using mouse and moving icons on the screen
— The My Computer icon, the Recycle Bin icon, Status Bar, Start button, Menu Bar
— Opening, closing and running an application
— Using Windows Explorer to view files, folders and directories
— Creating and renaming files and folders
— Windows settings: control panel, wallpapers, screen savers, date and time, sound
— Advanced features: using right mouse button, shortcuts, notepad, accessories

2. Basic DOS Commands
— Comparison of DOS and Windows, switching between DOS and Windows
— Creating, renaming, copying, moving, and deleting files and directories

3. Word Processing:
— Basics: opening and closing documents, saving documents, page setup, printing, scrolling around a document
— Text manipulation and formatting: text selection, cut, copy and paste, font, Bold, Italic and Underline, text alignment, line and paragraph setting, changing font, size and color, bullets and numbering, changing case
— Table manipulation: drawing and inserting table, changing cell width and height, alignment of text in cell, inserting and deleting rows and columns, table borders

4. Spreadsheets:
— Basics: opening and closing of spreadsheet, multiple sheets, Menu Bar, cell inputting, cell addressing
— Manipulation of cells: entering texts, creating tables, setting cell width and height, copying of cells
— Formulas: sum, average, percentage, and other basic functions
— Preparing invoices/budgets, totaling of transactions, maintaining daily and monthly reports

5. Presentations:
— Basics: opening a PowerPoint presentation, using Wizard to create a presentation
— Slide presentation: title, text, picture, table, font color and font size, bullets and indenting, slide design, background, slide numbering, slide show, slide animation, slide sorting, printing slides

6. Computer Communication and Internet:
— Basics of computer network, WWW, and websites
— Web browsing, net surfing, chatting, using e-mails

7. Computer Hardware
- Assembling and disassembling of computer system
- Installation of operating system, utilities and application software
- Installation of printer
- Routine checks and troubleshooting
- Virus protection
- Network cabling and Internet connectivity

References:

1. Peter Norton, "Peter Norton's Introduction to Computer", Tata McGraw-Hill Publishing Company Limited
2. Robert Cowart, "Mastering Windows-Premium Edition", BPB Publication
3. Ron Mansfield, "Mastering Word", BPB Publication
4. Thomas Chester, "Richard A. Alden, Mastering Excel", BPB Publication
5. Katherine Murray, "Mastering Power Point", BPB Publication
6. Shankar N. Adhikary, Ajay K. Shah, "Business Application of Computers", Buddha Publication
7. Winn L. Rosch, "The Hardware Bible", 3rd Edition, PHI
8. Mark Minasi, "The Complete PC Upgrade & Maintenance Guide"
9. Scott Mueller, "Upgrading & Repairing PCs"
10. Alexis Leon & Mathews Leon, "Fundamentals of Information Technology", Leon Techworld
11. P. K. Sinha, "Computer Fundamentals", BPB Publication
12. V. Rajaraman, "Fundamentals of Computer"

Mathematics I
BIT102HS

Year : I

Semester : I

Teaching Schedule Hours/Week			Examination Scheme				
Theory	Tutorial	Practical	Internal Assessment		Final		Total
			Theory	Practical	Theory	Practical	
3	2	-	20	-	80	-	100

Course Objective: The main objective of this course is to enable students to apply mathematical tools such as linear algebra, differential calculus and analytical geometry in information technology.

Course Contents:

Unit 1: Matrix Algebra
(7 hrs)

Definition, Equality of matrices, Addition& Scalar Multiplication of a matrix; Product of matrices; Some special types of matrices; Matrices & Determinants (simple cases only); Adjoint & Inverse of a matrix; Cramer's rule; Use of matrices in solving a system of linear equations (Homogenous & Non- homogeneous system).

Unit 2: Coordinate Systems
(5 hrs)

Rectangular coordinates in a plane; Polar coordinates; Rectangular coordinates inspace; Cylindrical polar coordinates; Spherical polar coordinates; Transformation of one coordinate system into another system.

Unit 3: Elementary Coordinate Geometry
(5 hrs)

The conic sections; Translation of Axes; Equation of a conic in polar coordinates.

Unit 4: Vectors and Solid Geometry
(10 hrs)

The concept of a vector; Addition & Subtraction of vectors; Resolution of vectors; Scalar Dot product of two vectors; Vector Cross product of two vectors; Equations of Line and Plane; Product of three or more vectors; Sphere, Cylinder and Cone; Quadratic Surfaces

Unit 5: Applications of Differentiation
(8 hrs)

Geometrical Applications; Related Rates; Roll's and Mean – Value theorems; Indeterminate forms; Maxima and Minima; Taylor's and Maclaurin's series; Curvature; Asymptotes.

Unit 6: Applications of the Definite Integral
(5 hrs)

Area bounded by a curve; Volume and surface area of solids of revolution; Length of an arc of a curve; Area and volume in polar coordinates.

Unit 7: Functions of Several Variables
(5 hrs)

Function of several variables; Limits and continuity; Partial derivatives, First and Second Order; Homogenous functions, Euler's Theorem.

References:

1.   Engineering Mathematics Vol.: S. S. Sastry Prentice Hall of India.

2. Fraleight J. B. Calculus with analytic grometry, Addisen Wesley pub. Community. Inc(1980)

3. Bajpai, A.C Calus I.M. and fairley, J.A.Mathematics for Engineering & Scientist, Vol I john wiley & sons (1973).

4. Goldstain, I.J. Lay D.C. and Schneider, D.I Calculus and its Application,s Prentice Hall Inc. (1977)

5. Spiegel, M.R. Theory and problems of advanced calculus schaum publish.

6. Srivastava, R.S.L. Engineering Mathematics, Vol I, Tata, McGraw hill pub (1980)

7. N. Saran & J.K. Goyal, Introduction to matrices pragatic Prakashan (1990)

Technical Communication
BIT103HS

Year: I   **Semester: I**

Teaching Schedule Hours/Week			Examination Scheme				
Theory	Tutorial	Practical	Internal Assessment		Final		Total
			Theory	Practical	Theory	Practical	
3	1	-	20	20	60	-	100

Course objective: The main objective of this course is to develop intensive and extensive skills needed for oral presentation and writing and presenting a seminar paper

Course Contents:

Unit 1: Oral Communication   (10 Hrs)
Oral Presentation Skills: Introduction; Getting Started on Presentations; Planning; Organizing and Composing; Preparing; Rehearsing; Presenting; Organizing a Group Presentation; Writing and Presenting a Seminar Paper

Unit 2: Reading: Intensive and Extensive   (16Hrs)
Intensive Reading: How to Tackle Reading Materials; Practice on Contextual Grammar (Prepositions; Active Voice and Passive Voice; Tense based Practice; Direct Speech and Indirect Speech; Subject Verb Concord; Error Analysis; Stress); Reading Techniques (Skimming; Scanning; Note Making; Summary Writing.
Extensive Reading: How to Tackle Extensive Reading Materials; Practicing Extensive Reading.

Unit 3: Writing   (19Hrs)
Business Communication: Rules of Good Writing; Fax Message and Electronic Mails; Memos; Meetings (Notice Preparation, Agenda Preparation and Minutes Preparation).
Persuasive Communication: Notices, Advertisements and Leaflets.
Letters: Official Letters (Standard Letter Format; Writing Letters for Asking and Giving Instruction, Letters of Request, Apology and Explanation, Complaint and Order); Letter of Application (Standard Format; Preparing CV, Bio-data and Resume; Writing Letters of Application).
Proposals: Introduction; What Is a Proposal?; Getting Started on Proposal; Composing Informal; Proposals; Composing Formal Proposals.
Information Reports: Introduction; Getting Started on Informative Reports; Summary and Abstract; Mechanism and Description; Periodic Reports; Progress Reports; News Releases.
Recommendation Reports: Introduction; What Is a Recommendation Report? Starting a Recommendation Report; Formatting and Organizing Recommendation Reports; Composing Recommendation Reports.

Workshop/seminar(s) should be conducted to enhance the reading, writing, listening and speaking skills.

References:

1. Taylor, Shirely. Communication for Business: A Practical Approach. London: Longman, 2005.

2. Smith-Worthington, Daelene and Sue Jefferson. Technical Writing for Success. 3rd ed.USA: Cengage Writing, 2011.

3. Adhikari, Usha, et al. A Course Book of Communicative English. Kathmandu: Trinity Publications, 2012

4. Mohan, Krishna and Banerji, Meera. (1990). Developing Communication Skills. Macmillan: New Delhi.

5. Gerson, S. J. and Gerson S. M. (2007). Technical Writing. Pearson Education: New Delhi.

6. Leech, G. And Svartvik, J. (1975). A Communicative Grammar of English. ELBS: England.

7. Sinha, R. P. (1991). How to Write Correct English. BharatiBhawan: India.

8. Swan, Michael. (1980). Practical English Usage. OUP: Oxford.

9. Thakur, K. P. (1989). A Practical Guide to English Grammar. BharatiBhawan: India.

Society & Ethics in IT
BIT104HS

Year: I

Semester: I

Teaching Schedule Hours/Week			Examination Scheme				
Theory	Tutorial	Practical	Internal Assessment		Final		Total
			Theory	Practical	Theory	Practical	
3	1		20		80	-	100

Course Objective: The main objective of this course is to provide students with technical and emotional aspects of sociology and its components.

Course contents:

Unit 1: Introduction [4 Hrs]
Definition and evolution of sociology; Relationship of sociology with economics, political science and computer science; Applications of sociology.

Unit 2: Social and Cultural Change [6 Hrs]
Process (Innovation, invention diffusion, and discovery); Theories of social change (evolution, functional, conflict); Factors of social change (economics, technology, education, demography); Role of media and communication in social and cultural change; Resistance of social change; Technological changes and its consequences.

Unit 3: Understanding Development [5 Hrs]
Definition and approaches of development; Indicators of development and features of developing countries; Development planning; Role of national and international community and state.

Unit 4: Process of Transformation [4 Hrs]
Modernization, globalization and migration; E-governance & E-commerce.

Unit 5: Characteristics of Nepali Society and Culture [5 Hrs]
Historical development of Nepal; Demographic composition; Contemporary Issues(gender, caste and ethnicity); National integration and differentiation; Social stratification, problems and control.

Unit 6: Ethical issues in IT [5 Hrs]
Definition of profession and professional ethics; Code of conduct; Ethical dilemma and problems; Disciplinary action; Corporate social responsibility.

Unit 7: Introduction to Emotional Intelligence [9 Hrs]
Definition and benefits of Emotional Intelligence; Components of Emotional Intelligence; Self Management, Self Awareness, Self Regulation, Self Motivation, Empathy; Domains and competencies of Emotional Intelligence; Emotional leadership development; Skills in Emotional Intelligence: Accurately perceive emotions, Use emotions to facilitate thinking, Understand emotional meanings, Manage emotions; Optimism, Pessimism and the balance between optimism and pessimism.

Unit 8: Social Management and Responsibility [7 Hrs]

Social skills to make an impact in the society; Creating a powerful first impression; Assessing a situation in the society and workplace, understand Emotions and manage them; Role of Emotional Intelligence at Social Environment; Articulate the Emotions Using Language; Disagreeing Constructively.

Reference:

1. Alex Inkles, "What is Sociology? Introduction in the Discipline & Profession", Prentice Hall of India
2. Daniel Goleman ," Emtional Intelligence : Why it can matter more than IQ"
3. Giddens & D. Mitchell, "Introduction to Sociology", 3rd Ed., London, W.W. Norton &Company
4. M. Foster, "Traditional Culture & Impact of Technological Change"
5. N.S. Rao, "Principle of Sociology with an Introduction of Social Thought", S. Chand & Co. Ltd.
6. Pratley Peter, "The Essence of Business Ethics", Prentice Hall of India, New Delhi
7. Rishikeshav Raj Regmi, "Dimension of Nepali Society and Culture".

Computer Programming in C
BIT105CO

Year: I

Semester: I

Teaching Schedule Hours/Week			Examination Scheme				
Theory	Tutorial	Practical	Internal Assessment		Final		Total
			Theory	Practical	Theory	Practical	
3	1	3	20	50	80	-	150

Course Objective: The main objective of this course is to enable students familiarize with writing algorithms and developing programs using C language.

Course Contents:

Unit 1: Problem Solving with Computer (3 Hrs)
Problem analysis, Algorithms and Flowchart; History and Importance of C; Structure of C program; Coding, Compilation and Execution; Debugging, Testing and Documentation.

Unit 2: Elements of C (3 Hrs)
C Tokens; Escape sequence; Variables; Data types; Constants/Literals; Expressions; Statements and Comments.

Unit 3: Input and Output (4 Hrs)
Conversion specification; I/O operation; Unformatted and Formatted I/O.

Unit 4: Operators and Expression (3 Hrs)
Arithmetic operator; Relational operator; Logical and Boolean operator; Assignment operator; Ternary operator; Bit-wise operator; Increment and Decrements operator.

Unit 5: Control Statements (4 Hrs)
Branching; Looping; Exit function, Break and Continue statement; Goto statement.

Unit 6: Arrays (6 Hrs)
Introduction; Declaration of array; Initialization of array; Sorting; Multidimensional array; String and String handling functions.

Unit 7: Functions (5 Hrs)
Local, global, static and Register variables; Library functions and User-defined functions; Pass by value and Pass by reference; Recursion; Use of array in function.

Unit 8: Pointers (6 Hrs)
Introduction and importance of Pointers; Reference and dereference operator; Pointer arithmetic; Pointer and array; Pointer with multidimensional array; Pointer and strings; Dynamic memory allocation.

Unit 9: Structure and Union (5 Hrs)
Introduction; Array of structure; Passing structure to function; Passing array of structure to function; Pointer to structure; Structure within structure (Nested structure); Union.

Unit 10: Files and File Handling in C (4 Hrs)

Introduction and Importance of files; Opening and closing a file; File Opening Modes; Input/output function; Sequential and Random access in file.

Unit 11: Introduction to Graphics   (2 Hrs)
Modes; Initialization; Graphics Function.

Laboratory: Laboratory exercises are necessary to be done in different chapters. At the end of each chapter, laboratory reports are required to be submitted to teacher for evaluation.

LABORATORY EXERCISE FOR BCA104CO
Lab class will cover all above mentioned topics and shall include at least the following lab exercises.

1. Display messages as output
2. Simple interest calculation
3. Area and circumference of circle
4. Area and perimeter of rectangle
5. Character conversion from lower case
6. Character conversion from upper case to lower case and vice versa
7. Reading and writing a line of text
8. Averaging student exam scores
9. Compound interest calculation
10. Syntactic errors
11. Execution errors (Real root of a quadratic equation)
12. Debugging a program
13. Debugging with an interactive Debugger
14. Calculating total expenses
15. Calculating bonus
16. Calculating division of students
17. Generating consecutive integer quantities
18. Averaging a list of numbers
19. Converting Several lines of character to uppercase
20. Encoding a string of characters
21. Repeated compound interest calculations with error trapping
22. Solution of an algebraic equation
23. Calculating depreciation
24. Searching for palindromes
25. Largest of three integers quantities
26. Calculating factorials
27. Simulation of a game of chance
28. Printing backwards
29. The tower of Hanoi
30. Average length of several lines of text
31. Search for a maximum
32. Generating Fibonacci numbers
33. Deviation about an average
34. Reordering a list of numbers
35. A piglatin generator
36. Factors, prime Factors, LCM, HCF
37. Adding two tables of numbers

38. Recording a list of strings
39. Analyzing a line of text
40. Displaying the day of the year
41. Future value of monthly deposit (compound interest calculations)
42. Updating customer records
43. Locating customer records
44. Raising a number to a power
45. Creating a data file (lower case to upper case text conversion)
46. Reading a data file
47. Creating a file containing customer records
48. Updating a file containing customer records
49. Creating an unformatted data file containing customer records
50. Graphic programming- Displaying different shapes

References:

1. E. Balagurusamy "Programming in ANSI C", Tata Mc Graw-Hill Publishing.
2. Deitel: C: How to program, 2/e(with CD), Pearson Education.
3. Al Kelley, Ira Pogl, "A Book on C", Pearson Education.
4. Brian W. Kernighan & Dennis M. Ritchie, "The C Programming Language", PH.
5. Byron S. Gottfried, "Programming with C, Tata Mc Graw-Hill Publishing.
6. Stephen G. Kochan, "Programming in C", CBS publishers & distributors.
7. Yashvant Kanetker "Let Us C", BPB Publication.

Project-I
BIT106CO

Year: I

Semester: I

Teaching Schedule Hours/Week			Examination Scheme				
Theory	Tutorial	Practical	Internal Assessment		Final		Total
			Theory	Practical	Theory	Practical	
-	-	3	-	60	-	40	100

Course Objective: The main objective of this course is to enable students design and complete the software project by using high-level language (C-Programming).

Course Contents:

A Project group will be developing a software project by using high-level language (C-Programming / BIT105CO). Every student of the group should work at least for 45 lab hours under the supervision of the assigned supervisor. Students must develop the assigned software, submit written report, and give oral presentation.

General Procedure:
1. Information Gathering
2. System requirements specifications
3. Algorithms and Flowchart
4. Coding Techniques
5. Result
6. Documentation

The Project document shall include the following:
1. Technical description of Project
2. System aspect of the project
3. Implementation of project
4. Project tasks and time schedule
5. Project team members
6. Project Supervisor

Project Evaluation Criteria for Internal assessment:
The marks allocated for the project should be evaluated based on the following criteria:
- Title identification and Proposal Writing— 10 Marks
- Mid-term Presentation — 20 Marks
- Pre-final Submission and final Presentation — 30 Marks

Project Evaluation Criteria for External assessment:
The marks allocated for the project should be evaluated based on the following criteria:
- Project Documentation— 20 Marks
- Final Presentation — 10 Marks
- VIVA - 10 Marks

Project Group Size: 2 to 3 students in one group.