FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

Bachelor of Science (Information Technology)

(Semester I-VI)

(Under Continuous Evaluation System)
(12+3 System of Education)

Session 2021-22

The Heritage Institution

KANYA MAHA VIDYALAYA JALANDHAR
(Autonomous)

Program Specific Outcomes

Bachelor of Science (Information Technology)
(Session 2021-22)

After completing this program, the students will be able to:

PSO1: Apply skills for development of software and websites for providing efficient solution to IT based problems.

PSO2: Comprehend development process in IT industry through ethical, defined and innovative techniques.

PS03: Achieve leadership role and team player role to be able to work in multidisciplinary areas at various job roles.

PSO4: Identify and demonstrate the implementation of various tools and technologies involved in the field of Information Technology.

PSO5: Demonstrate proficiency in the field of Programming, Web development and IT enabled services.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME
Bachelor of Science (Information Technology)

Session 2021-22

Course Code	Course Name	Course Type	Marks				Examination Time (in Hours)
			Total	**Ext.**		**CA**	
				L	**P**		
BITL-1421 / BITL-1031/ BITL-1431	Punjabi (Compulsory) / [1]Basic Punjabi/ [2]Punjab History and Culture	C	50	40	-	10	3
BITL-1102	Communication Skills in English	C	50	40	-	10	3
BITL-1333	Applied and Discrete Mathematics	C	100	80	-	20	3
BITM-1114	Introduction to Programming – C	C	100	50	30	20	3+3
BITM-1115	Fundamentals of Computers	C	100	50	30	20	3+3
AECD-1161	[*]Drug Abuse: Problem, Management and Prevention (Compulsory)	AC	50	40	-	10	3
SECF-1492	[*]Foundation Course	AC	25	20	-	05	1
	Total		**400**				

Note:

C - Compulsory
AC - Audit Course
[1] Special course in lieu of Punjabi (Compulsory)
[2] Special course in lieu of Punjabi (Compulsory) for those students who are not domicile of Punjab.
[*]Marks of these courses will not be added in total marks and only grades will be provided.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME
Bachelor of Science (Information Technology)

Session 2021-22

Bachelor of Science (Information Technology) Semester – II							
Course Code	**Course Name**	**Course Type**	**Marks**				**Examination Time (in Hours)**
			Total	**Ext.**		**CA**	
				L	**P**		
BITL-2421 / BITL-2031/ BITL-2431	Punjabi (Compulsory) / [1]Basic Punjabi/ [2]Punjab History and Culture	C	50	40	-	10	3
BITM-2102	Communication Skills in English	C	50	25	15	10	3+3
BITL-2113	Principles of Digital Electronics	C	100	80	-	20	3
BITL-2114	Numerical Methods and Statistical Techniques	C	100	80	-	20	3
BITM-2115	Introduction to Object Oriented Programming-I	C	100	50	30	20	3+3
AECD-2161	*Drug Abuse: Problem, Management and Prevention (Compulsory)	AC	50	40	-	10	3
SECM-2502	*Moral Education	AC	25	20	-	05	1
	Total		**400**				

Note:

C - Compulsory
AC - Audit Course
[1] Special course in lieu of Punjabi (Compulsory)
[2] Special course in lieu of Punjabi (Compulsory) for those students who are not domicile of Punjab.
***Marks of these courses will not be added in total marks and only grades will be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science (Information Technology)

Session 2021-22

Bachelor of Science (Information Technology) Semester – III							
Course Code	**Course Name**	**Course Type**	**Marks**				**Examination Time (in Hours)**
			Total	**Ext.**		**CA**	
				L	**P**		
BITL-3111	Computational Problem Solving	C	75	60	-	15	3
BITL-3112	Data Structures	C	75	60	-	15	3
BITL-3113	System Analysis and Design	C	75	60	-	15	3
BITP-3114	Lab on Computational Problem solving	C	50	-	40	10	3
BITP-3115	Lab on Data Structures	C	25	-	20	05	3
AECE - 3221	*Environmental Studies (Compulsory)	AC	100	60	20	20	3
SECP - 3512	*Personality Development	AC	25	20	-	05	1
	Total		**300**				

Note:

   C - Compulsory

   AC - Audit Course

   * Marks of these courses will not be added in total marks and only grades will be provided.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science (Information Technology)

Session 2021-22

Course Code	Course Name	Course Type	Marks				Examination Time (in Hours)
			Total	Ext.		CA	
				L	P		
BITL-4111	Database Management System	C	75	60	-	15	3
BITL-4112	Internet Applications	C	75	60	-	15	3
BITL-4113	Object Oriented Programming- II	C	75	60	-	15	3
BITL-4114	E-Business	C	75	60	-	15	3
BITP-4115	Lab on Database Management System	C	50	-	40	10	3
BITP-4116	Lab on Object Oriented Programming - II	C	50	-	40	10	3
SECS - 4522	*Social Outreach	AC	25	-	20	05	1
	Total		**400**				

Note:

    C - Compulsory

    AC - Audit Course

   * Marks of these courses will not be added in total marks and only grades will be provided.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science (Information Technology)

Session 2021-22

Bachelor of Science (Information Technology) Semester - V							
Course Code	**Course Name**	**Course Type**	**Marks**				**Examination Time (in Hours)**
			Total	**Ext.**		**CA**	
				L	**P**		
BITL-5111	Computer Networks	C	100	80	-	20	3
BITL-5112	Web Technologies	C	100	80	-	20	3
BITL-5113	Operating System	C	100	80	-	20	3
BITP-5114	Lab on Web Technologies	C	50	-	40	10	3
BITP-5115	Lab on Operating System	C	50	-	40	10	3
SECJ-5551	* Job Readiness Course	AC	25	20	-	05	1
	Total		**400**				

Note:

C – Compulsory

* Marks of these courses will not be added in total marks and only grades will be provided

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science (Information Technology)

Session 2021-22

Bachelor of Science (Information Technology) Semester - VI							
Course Code	**Course Name**	**Course Type**	**Marks**				**Examination Time (in Hours)**
			Total	**Ext.**		**CA**	
				L	**P**		
BITL-6111	Computer Graphics	C	75	60	-	15	3
BITL-6112	Software Engineering	C	75	60	-	15	3
BITP-6113	Lab on Computer Graphics	C	50	-	40	10	3
BITD-6114	Project	C	200	-	160	40	3
	Total		**400**				

Note:

C - Compulsory

Bachelor of Science (Information Technology) Semester- I

Session 2021-22
COURSE CODE: BITL–1333
APPLIED AND DISCRETE MATHEMATICS

Course Outcomes:

Student will be able to:

CO1: Have knowledge of matrices, sets, relations, propositional logic and Boolean algebra.

CO 2: Represent world knowledge in symbolic notation through propositional calculus.

CO 3: Apply discrete mathematical concepts to obtain analytical and numerical solutions.

Bachelor of Science (Information Technology) Semester- I

Session 2021-22
COURSE CODE: BITL–1333
APPLIED AND DISCRETE MATHEMATICS

Examination Time: 3 Hrs.   Max. Marks: 100
                                                                  Theory: 80
                                                                  CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts(not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Sets and Relations: Definition of sets, subsets, complement of a set, universal set, intersection and union of sets, De-Morgan's laws, Cartesian products, Equivalent sets, Countable and uncountable sets, minset, Partitions of sets, Relations: Basic definitions, graphs of relations, properties of relations

UNIT-II

Logic and Propositional Calculus: Proposition and Compound Propositions, basic Logical Operations, Propositions and Truth Tables, Tautologies and Contradictions, Logical Equivalence, Duality law, Algebra of propositions, Conditional and Bi conditional Statements, Arguments, Logical Implication, Propositional Functions, Predicates and Quantifiers, Negation of Quantified Statements, Inference theory of the predicates calculus.

UNIT-III

Boolean Algebra: Boolean algebra and its duality, Duality, Boolean Algebra as Lattices, Boolean identities, sub-algebra, Representation Theorem, Sum-of-Products Form for Sets, Sum of-Products Form for Boolean Algebra, Minimal Boolean Expressions, Prime Implicants, Boolean Functions, Karnaugh Maps.

UNIT-IV

Matrices: Introduction of a Matrix, its different kinds, matrix addition and scalar multiplication, multiplication of matrices, transpose etc. Square matrices, inverse and rank of a square matrix, Matrix Inversion method.

References/Textbooks:

1. Seymour Lipschutz, Marc Lars Lipson, Discrete Mathematics (Schaum's outlines Series), McGraw-Hill, 1997.
2. Bernard Kolman, Robert C. Busby, Discrete Mathematical structures for Computer Science, Prentice-Hall, 1984.
3. Alan Doerr, Kenneth Levasseur, Applied Discrete Structures for Computer Science, Galgotia Publications, 1989.
4. J.P.Tremblay. and R Manohar, Discrete Mathematical Structures with Applications to Computer Science, McGraw-Hill, 1997.

Note: The latest editions of the books should be followed.

Bachelor of Science (Information Technology) Semester- I

Session 2021-22
COURSE CODE: BITM–1114
INTRODUCTION TO PROGRAMMING - C

Course Outcomes:

After passing course the student will be able to:

CO1: Understand formulation of algorithms and flowcharts for problem solution and different programming constructs.

CO2: Have knowledge of execution flow of a C program for programming and maintenance.

CO3: Apply programming concepts to provide solution in different problem domains.

Bachelor of Science (Information Technology) Semester- I

Session 2021-22
COURSE CODE: BITM–1114
INTRODUCTION TO PROGRAMMING - C

Examination Time: (3+3) Hrs.

Max. Marks: 100
Theory: 50
Practical: 30
CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts(not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Fundamentals: Character set, Identifiers and Key Words, Data types, Constants, Variables,Expressions, Statements, Symbolic Constants.

Operations and Expressions: Arithmetic operators, Unary operators, Relational Operators,Logical Operators, Assignment and Conditional Operators, Library functions. Data Input and Output statements

UNIT -II

Control Statements: Preliminaries, While, Do–while and for statements, Nested loops,If–else, Switch, Break – Continue statements.

Program Structure Storage Class: Storage Classes- Auto, extern, register and static .about library functions.

UNIT-III

Functions: Brief overview, defining, accessing functions, passing arguments tofunction, specifying argument data types, function prototypes, recursion.

Arrays: Defining, processing an array, passing arrays to a function, multi–dimensional arrays.

Strings: String declaration, string functions and string manipulation.

UNIT - IV

Structures & Unions: Defining and processing a structure, user defined data types, structuresand pointers, passing structures to functions, self referenced structure, unions.

Pointers: Fundamentals, pointer declaration, passing pointer to a function, pointer and onedimensional arrays, operation on pointers, pointers & multi–dimensional arrays of pointers, passing functions, other functions, more about pointer declarations.

References/Textbooks:

1. E Balagurusamy, Programming in ANSI C, Tata McGraw-Hill, 2002.
2. Byron Gottfried, Schaum's Outline Programming with C, McGraw Hill, 1996.
3. Brian W. Kernighan, Dennis M. Ritchie, The C Programming language, Prentice Hall, 1988.
4. Stephen G. Kochan, Programming in C, Pearson Education, 2015.

Note: The latest editions of the books should be followed.

Bachelor of Science (Information Technology) Semester- I

Session 2021-22
COURSE CODE: BITM–1115
FUNDAMENTALS OF COMPUTERS

Course Outcomes:

After passing course the student will be able to:

CO1: Have knowledge of Computer fundamentals, operating system concepts and office automation software.

CO2:Apply office automation software to create professional and academic documents and presentations.

CO3: work on Spreadsheet application for office tasks.

Bachelor of Science (Information Technology) Semester- I

Session 2021-22
COURSE CODE: BITM–1115
FUNDAMENTALS OF COMPUTERS

Examination Time: (3+3) Hrs.
Max. Marks: 100
Theory: 50
Practical: 30
CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (10 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts(not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Fundamentals of Computer: Introduction to computer, Applications of computer, Components of computers (Input unit, Output Unit, Memory Unit & CPU).

Software: Application Software, Service software, System software -operating system (Types & Function of OS), Translators (compiler, interpreter, assembler), Booting a System.

UNIT II

Input Devices: Keyboards, Mouse, Joystick, Track Ball, Light Pen and Data Scanning devices (scanner, OCR, OMR, MICR, Bar Code Reader, Card Reader)

Output Devices: Monitor, Printers (laser printer, dot matrix printer, ink jet printer)

Memories: Primary Memory -RAM (Working and Its types), ROM (Types of ROM). Secondary Memory - Hard Disk (Structure of a hard disk, working, concept of tracks, sectors, clusters, cylinders), CD, DVD.

UNIT III

Word Processing: Introduction to Office, word processing & its features, Parts of window of word (Title bar, menu bar, status bar, and ruler), understanding the Ribbon, Use of Office Button and Quick Access Toolbar, Creation of new documents, opening document, insert a document into another document. Page setup, margins, gutters, font properties, Alignment, page breaks, header & footer, deleting, moving, replace, editing text in document, saving a document, spell checker, printing a document. Creating a table, entering and editing, Text in tables. Changing format of table, height, width of row/column. Editing, deleting Rows,

columns in table. Adding picture, page colors and Watermarks, Borders, shading, Templates, wizards, drawing objects.

Presentation: Introduction to PowerPoint, Exploring menus, starting a new slide, saving presentation, moving/rearranging slides, printing slides. Applying theme to presentation, Views (slide View, slide sorter, notes view, outline view), Formatting & enhancing text formatting. Displaying slide show, adding multimedia. Slide transitions, applying Animation, Timing slide display, adding movies & sounds.

UNIT IV

Spreadsheet: Introduction to Worksheet/Spreadsheet, Features of excel, Describe the excel Window, Creating a new workbook, different functions on different data in excel, creation of graphs, editing it and formatting, creation of worksheet, adding, deleting, moving the text in worksheet, sorting the data, querying the data, filtering the data (auto and advance filters), To open an already existing workbook, Saving workbook, printing a worksheet, Closing the workbook & exiting.

References/Textbooks:

1. Joyce Cox, Joan Lambert and Curtis Frye, Microsoft office Professional 2010 Step by Step, Microsoft Press, 2010.
2. V. Rajaraman, NeeharikaAdabala, Fundamentals of Computers, PHI Learning, 2015.
3. P.K. Sinha, Computer Fundamentals, BPB Publications, 2004.
4. Anshuman Sharma, A book of Fundamentals of Information Technology, Lakhanpal Publishers, 5th Edition.
5. Peter Norton, Peter Norton's Computing Fundamentals, McGraw-Hill Technology Education, 2006.

Note: The latest editions of the books should be followed.

Bachelor of Science (Information Technology) Semester- II
(Session 2021-22)
COURSE CODE: BITL–2113
PRINCIPLES OF DIGITAL ELECTRONICS

Course Outcomes:

After the completion of this course, the student will be able to:

CO1: Comprehend and apply the number systems and Boolean Algebra.

CO2: Design advanced and complex electronic circuits.

CO3: Reduce Boolean Expressions and implement them with Logic Gates.

CO4: Demonstrate the internal structure of semiconductor memory

Bachelor of Science (Information Technology) Semester- II
(Session 2021-22)
COURSE CODE: BITL–2113
PRINCIPLES OF DIGITAL ELECTRONICS

Examination Time: 3 Hrs   **Max. Marks: 100**
                                                                              Theory:80
                                                                              CA:20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts(not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I
Number System: Introduction, number conversion system , binary arithmetic, representation ofsigned binary numbers, 1's and 2's complement, Codes: straight binary code, BCD Code Excess3 Code, Grey Code ASCII, Integer and floating point representation

UNIT-II
Logic Gates and Boolean Algebra: Logic gates, Universal Gates, Boolean algebra andMinimization techniques, canonical forms of Boolean expressions, K-Map

UNIT- III
Combinational Circuits: Adder, Subtracter, Multiplexer, Demultiplexer, Decoder, Encoder
Sequential Circuits: Flip-flops, clocks and timers, registers, counter

UNIT-IV
Semiconductor memories: Introduction, Static and dynamic devices, read only & randomaccess memory chips, PROMS and EPROMS Address selection logic. Read and write control timing diagrams for ICs

References / Textbooks:

1. M. Morris Mao, Digital Design, Pearson Publication (2018), 6th Edition.
2. Ronald J. Tocci, Digital Systems, Pearson (2009), 10th Edition.
3. Morris Mano, Digital Logic and Computer Design, Pearson Education (2004), 1st Edition.
4. V.K. Jain, Arti Agarwal, Digital Electronics, Genius Publications Pvt. Ltd. (2018), 1st Edition

5. K. Meena, Principles of Digital Electronics, Prentice Hall India Learning Private Limited (2009), 1st Edition
6. William H. Gothmann, Digital Electronics: An introduction to Theory and Practice, Prentice Hall India Learning Private Limited (1982), 2nd Edition

Bachelor of Science (Information Technology) Semester- II
(Session 2021-22)
COURSE CODE: BITL–2114
NUMERICAL METHODS AND STATISTICAL TECHNIQUES

Course Outcomes:

After the completion of this course, the student will be able to:

CO1: Comprehend mechanics of elementary methods and statistical inference techniques for numerical analysis.

CO2: Demonstrate the application of numerical methods on different platform with the use of programming language.

CO3: Apply learned techniques to solve linear and non-linear equations related real world problems.

Bachelor of Science (Information Technology) Semester- II
(Session 2021-22)
COURSE CODE: BITL–2114
NUMERICAL METHODS AND STATISTICAL TECHNIQUES

Examination Time: 3 Hrs   **Max. Marks: 100**
Theory:80
CA:20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts(not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I
Introduction: Numerical Methods, Numerical methods versus numerical analysis, Errors and Measures of Errors.
Non–linear Equations: Bisection Method, False Position method and Newton Raphson's Method
Linear Equations: Direct Method - Gauss Elimination Method, Gauss Jordan Method, Iterative method – Gauss Seidal Method.

UNIT-II
Interpolation: Lagrange's method, Newton's Methods: Forward Difference Method, Backward Difference Method Divided Difference Method.
Numerical Integration: Trapezoidal Rule, Simpson's 1/3 method and Simpson's 3/8 Method

UNIT-III
Statistical Techniques:
Measure of Central Tendency: Arithmetic mean, Geometric Mean, Harmonic Mean, Median, Mode.
Measures of dispersion: Range, Quartile Deviation, Mean deviation, Standard deviation, Co–efficient of variation.

UNIT –IV
Correlation: Introduction, Karl Pearson's Coefficient of Correlation, Rank Correlation
Regression: Regression line and regression equations, Regression Coefficient
Curve Fitting: Fit a polynomial equation, Fit an exponential curve, Geometric Curve, Logarithmic curve

References / Textbooks:

1. AmrinderPalSngh, Jaspal Singh, Anshuman Sharma, Fundamentals Of Numerical Methods And Statistical Techniques, Lakhanpal Publishers, 4th edition.
2. Kandasamy P.& et AI., Numerical Methods, S. Chand & Company (2006), Reprint Edn. 2006 Edition.
3. B.S. Grewal, Numericals Methods in Engineering & Science, Khanna Publishers (2013), 11th Edition.
4. E. Balagurusamy, Numerical Methods, Tata McGraw Hill Education (2017)
5. H.S.G. Rao, Numerical Methods, IK International Publishing House (2011)
6. S.S. Sastry, Introductory methods of Numerical Analysis, PHI (2012), 5th Edition

Bachelor of Science (Information Technology) Semester- II
(Session 2021-22)
COURSE CODE: BITM–2115
INTRODUCTION TO OBJECT ORIENTED PROGRAMMING - I

Course Outcomes:

After the completion of this course, the student will be able to:

CO1: Comprehend the concepts of Object-Oriented Programming Paradigm

CO2: Write, compile and debug programs in C++, use different data types, operators and I/O function in a computer program.

CO3: Apply OOPs concepts to model real world problems for its simplified implementation.

Bachelor of Science (Information Technology) Semester- II
(Session 2021-22)
COURSE CODE: BITM–2115
INTRODUCTION TO OBJECT ORIENTED PROGRAMMING - I

Examination Time: (3+3) Hrs   **Max. Marks: 100**
Theory:50
Practical: 30
CA:20

Instructions for Paper Setter -

Eight questions of equal marks (50 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts(not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Programming Paradigms: Introduction to the object oriented approach towards programmingby discussing Traditional, Structured Programming methodology.

Objects & Classes: Object Definition, Instance, Encapsulation, Data Hiding, Abstraction,Inheritance, Messages, Method, Polymorphism, Classes, Candidate& Abstract Classes to be examples of the Design process.

UNIT-II
Object Oriented Programming using C++: Characteristics of OOP, Overview of C++, I/Ousing cout and cin, Objects and Classes, Member functions and data, private & public, constructor & destructor, Constructor Overloading, Types of Constructors.

UNIT-III
Function Overloading: Function Overloading, Default Arguments, Ambiguity in FunctionOverloading.
Operator Overloading: Overloading unary and binary operators, Type Conversion usingOperator Overloading

UNIT -IV
Inheritance: Concept of inheritance, Base & derived classes, Access Specifiers, ClassHierarchies, Types of Inheritance with examples.
Virtual Functions and Polymorphism: Virtual functions, friend functions, static function, thispointer, polymorphism, Types of Polymorphism with examples, templates, class templates.

References / Textbooks:

1. HerberttSchildt, C++: The Complete Reference, Tata McGraw-Hill Education India, 4th Edition.
2. Bjarne Stroustrup, The C++ Programming Language, Addison – Wesley Professional (2013), 4th Edition

3. Bjarne Stroustrup, A Tour of C++ (C++ In-Depth Series), Addison – Wesley Professional (2018), 2nd Edition

4. G.S. Baluja, C++ Program Design (w/CD), Khanna Book Publishing Company (2015), 2nd edition.

5. Stanley Lippman, JoseeLajoie, Barbara Moo, C++ Primer, Addison-Wesley Professional (2012), 5th edition.

6. Richard Johnsonbaugh and Martin Kalin, Object Oriented Programming in C++, Pearson Education (1999), 2nd Edition

Bachelor of Science (Information Technology) Semester – III

Session 2021-22
COURSE CODE: BITL–3111
COMPUTATIONAL PROBLEM SOLVING

Course Outcomes:

After passing course the student will be able to:

CO1: Understand the formulation of algorithms and programs for problem solving.

CO2: Gain understanding of various programming constructs like data types, operators, string processing and control structures.

CO3: Have knowledge of object oriented programming paradigms.

CO4: Have understanding of file handling, exception handling and SQLite database connectivity in Python.

Bachelor of Science (Information Technology) Semester – III

Session 2021-22
COURSE CODE: BITL–3111
COMPUTATIONAL PROBLEM SOLVING

Examination Time: 3 Hrs.   **Max. Marks: 75**

Theory: 60

CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT- I

Introduction to Problem solving using Python: Process of Computational Problem Solving, Python Programming Language.

Data and Expressions: Literals, Variables and Identifiers, Operators, Expressions, Statements and Data Types.

Control Structures: Boolean Expressions (Conditions), Logical Operators, Selection Control, Nested conditions, Debugging.

UNIT- II

Lists: List Structures, Lists (Sequences) in Python, Iterating Over Lists (Sequences) in Python.

Iteration: While statement, Definite loops using For, Loop Patterns, Recursive Functions, Recursive Problem Solving, Iteration vs. Recursion.

Dictionaries: Dictionaries and Files, Looping and dictionaries, Advanced text parsing.

UNIT- III

Functions: Fundamental Concepts, Program Routines, Flow of Execution, Parameters & Arguments.

Files: Opening Files, Using Text Files, String Processing, Exception Handling.

UNIT- IV

Objects and Their Use: Introduction to Object Oriented Programming.

Modular Design: Modules, Top-Down Design, Python Modules.

Using Databases and SQL: Database Concepts, SQLite Manager Firefox Add-on, SQL basic summary, Basic Data modeling, Programming with multiple tables.

References/Textbooks:

1. Charles Severance, Python for Informatics, Version 0.0.7.
2. Charles Dierbach, Introduction to Computer Science Using Python: A Computational Problem-Solving Focus, Wiley Publications, 2012.
3. Guttag John V, Introduction To Computation And Programming Using Python, PHI, 2014.
4. Jeeva Jose and Sojan P. Lal, Introduction to Computating& Problem Solving Through Python, Khanna Publishers, 2015.
5. Mark J. Guzdial, Introduction to Computing and Programming in Python, Pearson Education, 2015.
6. Kenneth Lambert, Fundamentals of Python, Course Technology, Cengage Learning, 2015
7. Mark Lutz, Learning Python, O'Reilly Media, 2013

Note: The latest editions of the books should be followed.

Session 2021-22
COURSE CODE: BITL–3112
DATA STRUCTURES

Course Outcomes:

After passing course the student will be able to:

CO1: Get familiarized with basic data structures.

CO2: Analyze algorithms to determine their efficiency.

CO3: Handle operations on various data structures.

CO4: Choose appropriate data structures according to real world problems.

Bachelor of Science (Information Technology) Semester – III

Session 2021-22
COURSE CODE: BITL–3112
DATA STRUCTURES

Examination Time: 3 Hrs.

Max. Marks: 75
Theory: 60
CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Basic Data Structure: Introduction to elementary Data Organization, Common Operation on Data Structures, Algorithm Complexity, Big O Notation, Time – Space tradeoff between Algorithms.

Arrays: Array Defined, Representing Arrays in Memory, Various Operations on Linear Arrays, Multidimensional Arrays.

UNIT-II

Sorting and Searching: Sorting Algorithms, Bubble Sort, Insertion Sort, Selection Sort, Merge Sort, Searching Algorithms, Linear Search and Binary Search.

Hashing: Hash Functions, Division Method, MidSquare Method, Folding Method.

Linked Lists Types of Linked Lists, Representing Linked Lists in Memory, Advantages of using Linked Lists over Arrays, Various Operations on Linked Lists.

UNIT-III

Stacks: Description of STACK structure, Implementation of Stack using Arrays and Linked Lists, Applications of Stacks – Converting Arithmetic expression from infix notation to polish and their subsequent evaluation, Quicksort Technique to sort an array.

Queues: Description of queue structure, Implementation of queue using arrays and linked lists, Description of priorities of queues, Dequeues.

UNIT-IV

Trees: Description of Tree Structure and its Terminology, Binary Trees and Binary Search Trees and their representation in Memory, Heapsort.

Graphs: Description of Graph Structure, Implement Graphs in Memory using Adjacency Matrix, PathMatrix, graph traversal techniques - DFS, BFS.

References/Textbooks:

1. Seymour Lipschutz, Data Structures, Schaum's OutlineSeries,McGraw Hill Company, 2013.
2. Aaron M. Tenenbaum, Data Structures usingC, Pearson Education, 1990.

Note: The latest editions of the books should be followed.

Bachelor of Science (Information Technology) Semester – III

Session 2021-22
COURSE CODE: BITL–3113
SYSTEM ANALAYSIS AND DESIGN

Course Outcomes:

After passing course the student will be able to:

CO1: Gather data to analyze and specify the requirements of a system.

CO2: Design database for storing data and user interface for data input and output,

CO3: Build modular and structured design of a system and in designing a model.

CO4: Identify the quality assurance and documentation tools.

Bachelor of Science (Information Technology) Semester – III

Session 2021-22

COURSE CODE: BITL–3113
SYSTEM ANALAYSIS AND DESIGN

Examination Time: 3 Hrs.   **Max. Marks: 75**
                                                                                    Theory: 60
                                                                                    CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT–I

System Planning and Analysis: Introduction to systems development life cycle and role of different stages. Requirement analysis, Problem definition, Feasibility Study and its importance. Information Gathering Tools, Cost Benefit Analysis, Role and Responsibilities of System Analyst.

UNIT–II

System Design: Introduction to Architectural Design, User Interface Design, Data Design, Tools for Structured design and System design considerations.

UNIT–III

System Testing: Introduction to testing and itstypes, Types of Documentation and Documentation Tools.

UNIT–IV

System Implementation: Quality Assurance, Managing system implementation, Transition to new system.

System Maintenance: Concept of maintenance and its importance, types of maintenance.

References/Textbooks:

1. Marvin R. Gore and John W. Stubbe, Elements of System Analysis, Dubuque, Iowa Wm.C.

Brown 1988.

2. Thapliyal M.P., System Analysis and Design,JBD Publisher, 2002.

3. Hoffer, Modern Systems Analysis and Design, George and Valacich, Pearson, 2014.

4. Dorny C. Nelson, Understanding Dynamic System: Approaches to Modelling, Analysis and Design, Pearson, 1993.

5. Perry Edwards, System Analysis and Design, McGraw-Hill, 1993.

6. Elias M. Awad, System Analysis and Design, Galgotia Publications, 1997.

7. James A. Senn, Analysis and Design of Information Systems, McGraw-Hill, 1989.

Note: The latest editions of the books should be followed.

Bachelor of Science (Information Technology) Semester – III

Session 2021-22

COURSE CODE: BITP–3114
LAB ON COMPUTATIONAL PROBLEM SOLVING

Examination Time: 3 Hrs.   **Max. Marks: 50**
                                                                Practical: 40
                                                                CA: 10

Lab–I: Lab on computational problem solving.

Bachelor of Science (Information Technology) Semester- III

Session 2021-22

COURSE CODE: BITP–3115
LAB ON DATA STRUCTURES

Examination Time: 3 Hrs.
Max. Marks: 25
Practical: 20
CA: 05

Lab – II: Lab on Data Structures.

Bachelor of Science (Information Technology) Semester- IV
(Session 2021-22)

COURSE CODE: BITL–4111

DATABASE MANAGEMENT SYSTEM

Course Outcomes:

After the completion of this course, the student will be able to:

CO1: Comprehend various terms like data, database and database models.

CO2: Illustrate the concept of database normalization and its various forms.

CO3: Apply SQL to design basic to intermediate level of databases.

CO4: Comprehend the use of Programming Language constructs like function, procedure, packages, etc. in database.

CO5: Acquire knowledge of big data and NoSQL.

Bachelor of Science (Information Technology) Semester- IV
(Session 2021-22)

COURSE CODE: BITL–4111

DATABASE MANAGEMENT SYSTEM

Max. Marks: 75
Theory: 60
CA: 15

Examination Time: 3 Hrs

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Introduction to data, field, record, file, database, database management system. Structure of database system, Advantages and disadvantages, levels of database system, Relational model, Hierarchical model, Network model, comparison of models, E–R diagram, different keys used in a relational system, DBA and responsibilities of DBA.

UNIT-II

Codd's Rules, Relational algebra, Relational calculus – Domain and Tuple relational Calculus, Query Processing and Optimization.

UNIT-III

Introduction to Normalization : Need and advantages of Normalization, INF, 2NF, 3NF, BCNF, 4NF and 5NF. Introduction to Transaction management – ACID properties, concurrency control and its management, protection, security, recovery of database.

UNIT-IV

SQL: Introduction to SQL–DDL, DML, DCL, Join methods & sub query, Union Intersection, Minus, Built in Functions, Views, Security amongst users, Sequences, Indexing.

Introduction to PL/SQL: Cursors– Implicit & Explicit, Procedures, Functions & Packages Database Triggers.

Big Data: Introduction to Big Data and Analytics, Introduction to NoSQL.

References / Textbooks:

1. C.J. Date, Introduction to Database System, Pearson Education (2003), 8th Edition
2. RamezElmasri and ShamkantNavathe, Fundamentals of Database Systems, Pearson Education (2015), 7th Edition
3. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Database System Concepts, McGraw Hill Education (2019), 7th Edition
4. P.S. Deshpande, SQL & PL / SQL for Oracle 11g, Dreamtech Press (2011)
5. Mahesh Mali, Database Management System for Engineering, TechKnowledge Publication, 2020
6. Raghu Ramakrishnan and Johannes Gehrke, Database Management System, McGraw Hill Education (2014), 3rd Edition
7. Rajiv Chopra, Database Management Systems, S. Chand Publishers (2016), 5th Edition

Bachelor of Science (Information Technology) Semester- IV
(Session 2021-22)

COURSE CODE: BITL–4112

INTERNET APPLICATIONS

Course Outcomes:

After passing course the student will be able to:

CO1: Comprehend basics of internet and its working.

CO2: Apply the concepts for better e-mail management.

CO3: Comprehend different Internet protocols and search engines.

CO4: Apply basic web designing technologies to design webpage.

COURSE CODE: BITL–4112

INTERNET APPLICATIONS

Max. Marks: 75
Theory: 60
CA: 15

Examination Time: 3 Hrs

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Introduction : About internet and its working, business use of internet, services effect by internet, evaluation of Internet, Internet Service Provider (ISP) windows environment for dial up networking (connecting to internet), audio on internet, internet addressing (DNS) and IP addresses.

E–Mail Basics: Introduction, advantage and disadvantage, structure of an email message, working of e–mail (sending and receiving messages), managing email (creating new folder, deleting messages, forwarding messages, filtering messages.

UNIT-II

Internet Protocol: Introduction, File Transfer Protocol (FTP), Gopher, Telnet, other protocols like HTTP and TCP/IP.

WWW: Introduction, Working of WWW, Web browsing (opening, viewing, saving and printing a web page and bookmark).

UNIT-III

Web designing: HTML: Elements, Attributes, Formatting, Paragraphs, Links, Lists, Tables, Images, Frames and Forms.

CSS: Types, Syntax, Colors, Backgrounds, Box Model, Fonts, Alignment, CSS Links.

Javascript: Syntax, Operators, Function & Array.

UNIT-IV

Search Engine: About search engine, Components of search engine, working of search engine, difference between search engine and web directory.

Internet and Extranet: Introduction, application of intranet, business value of intranet, working of intranet, role of extranet, working of extranet, difference between intranet and extranet.

References / Textbooks:

1. Anshuman Sharma, Fundamentals of Internaet Applications, Lakhanpal Publications (2016)

2. Ikvinderpal Singh, Internet Applications, Khanna Book Publishing Company (2011), 1st Edition

3. P. Rizwan Ahmed, Internet & its Applications, Margham Publications (2013)

4. Douglas E. Corner, Computer Networks and Internet with Internet Applications, Pearson (2008), 4th Edition

5. Satish Jain/Vineeta Pillai, Wireless Communication & Networking made Simple, BPB Publishers (2007)

6. Laura Lerney, Rafe Colburn, Jennifer Kyrnin, Mastering HTML, CSS &Javascript Web Publishing, BPB Publishers (2016), 1st Edition

COURSE CODE: BITL–4113

OBJECT ORIENTED PROGRAMMING- II

Course Outcomes:

After passing this course the student will be able to:

CO1: Apply OOPs concepts to model real world problems for its simplified implementation.

CO2: Comprehend fundamentals of Java programming.

CO3: Identify the utilization of packages, multithreading and Exception handling.

CO4: Demonstrate the concept of file handling and Applets.

Bachelor of Science (Information Technology) Semester- IV
(Session 2021-22)

COURSE CODE: BITL–4113

OBJECT ORIENTED PROGRAMMING- II

Max. Marks: 75
Theory: 60
CA: 15

Examination Time: 3 Hrs

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Introduction   to Java Programming: Features, Object Orientation Concepts, Java Virtual Machine, Data Types, Operators, Control Structures.

UNIT-II
Introduction to OOPS: Classes & Methods, Constructors, and Inheritance and Polymorphism

UNIT-III
Packages & Interfaces, Multithreading in Java, Exception Handling.

UNIT-IV
I/O Stream Classes & File Handling
Applets: Applet basics, Applet Life Cycle, Applet Display, Repaint, Parameter Passing.

References / Textbooks:

1. Herbert Schildt, Java – The Complete Reference, McGraw Hill Education (2017), 10th Edition
2. E Balagurusamy, Programming with Java, McGraw Hill (2019), Sixth Edition
3. Barry A. Burd, Beginning Programming with Java for Dummies (2017), 5th Edition
4. Sachin Malhotra and Saurabh Choudhary, Programming in Java, Oxford University Press (2018) Second edition.
5. R. Nageswara Rao, Core Java: An integrated Approach, Dreamtech Press (2016)

Bachelor of Science (Information Technology) Semester- IV
(Session 2021-22)

COURSE CODE: BITL–4114

E-BUSINESS

Course Outcomes:

After passing this course student will be able to:

CO1: Comprehend the basic terms of E-Commerce, its evolution, aims and benefits.

CO2: Acquaint about the steps to be followed for opening a new E-Commerce business, along with its Hardware & Software requirements.

CO3: Identify Electronic Payment systems and various issues involved in relation to secure electronic transactions.

CO4: Discuss BPR and Case Studies of E-Business related applications.

Bachelor of Science (Information Technology) Semester- IV
(Session 2021-22)

COURSE CODE: BITL–4114

E-BUSINESS

Examination Time: 3 Hrs   **Max. Marks: 75**
Theory: 60
CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT – I

E – Commerce: Definition, Aims, Benefits, VAN and EDI as Promoters, Types of E – Commerce.

Steps to Start E – Commerce: H/W & S/W Requirements, steps involved in opening your own online business.

UNIT - II

EDI: EDI Vs Traditional Systems, components of EDI system, EDI implementation issues, EDI service providers in India, Paper documents versus Electronic documents.

Concerns for E – Commerce: Legal and regulatory issues, Laws for E – Commerce, E-Commerce in India.

UNIT – III

Electronic Payment Systems: Various Methods of Electronic Payments – Google pay, Paytm, Debit and Credit Cards, UPI. Issues that confront in relation to securing electronic transactions. Implementation of digital signatures.

UNIT – IV

Re – Engineering for Change: Business process re – engineering (BPR), Methodology and Planning Methods for change.

Case Studies: To demonstrate usefulness of E – Commerce in various business areas like Banks, Reservations, E – Governance and E-Retailing.

References / Textbooks:

1. Chaffey, E-Business and E-Commerce Managemet: strategy, Implementation and Practice, Pearson Education India (2013), 5th Edition
2. Kenneth C. Laudon and Carol Guercio Traver, E-Commerce, Pearson (2018), 13th Edition
3. S.J. P.t. Joseph, E-Commerce: An Indian Prespective, PHI Learning Pvt. Ltd. (2019), 6th Revised Edition
4. Shruti Mathur, Ecommerce, Pinnacle Learning (2020)
5. David Whiteley, E-Commerce: Strategy, Technologies and Applications, McGraw Hill Education (2017).
6. Nidhi Dhawan, A handbook of E-Commerce, Sun India Publications (2017)

COURSE CODE: BITP–4115

LAB ON DATABASE MANAGEMENT SYSTEM

Max. Marks: 50
Practical: 40
CA: 10

Examination Time: 3 Hrs

Lab on Database Management System.

Bachelor of Science (Information Technology) Semester- IV
(Session 2021-22)

COURSE CODE: BITP–4116

LABON OBJECT ORIENTED PROGRAMMING- II

Examination Time: 3 Hrs

Lab on Object Oriented Programming – II .

Course Outcomes:

After passing course the student will be able to:

CO1: Describe the functions of each layer in OSI and TCP/IP model.

CO2: Understand the types of transmission media with real time applications

CO3: Describe the Data Link layer and Network layer design issues.

CO4: Explain the functions of Transport layer and Application layer protocols.

CO5: Have a basic knowledge of the use of cryptography and network security.

Bachelor of Science (Information Technology) Semester – V

Session 2021-22
COURSE CODE: BITL-5111
COMPUTER NETWORKS

Examination Time: 3 Hrs.   **Max. Marks: 100**
                                                                                            Theory: 80
                                                                                            CA: 20

Instructions for Paper Setter -
Eight questions of equal marks (16 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT – I

Introduction: Basic concepts of Computer Networks, Basic Components of a Network, Network types and topologies.

Models: OSI Reference Model, TCP/IP Model, Comparison between TCP/IP and OSI model

Transmission Media: Coaxial Cable, Twisted Pair Cable, Fiber Optics &Satellites.

UNIT – II

Network Devices: Hub, Switch, Repeaters, Bridges, Routers, Gateways.

Introduction to Analog and Digital Transmission: Telephone system, Modems, Types of modems, pulse code modulation. Multiplexing and its types, Circuit Switching, Packet Switching, Message Switching, ISDN service transmission.

UNIT - III
Data Link Layer Design Issues: Framing, Error Control, Flow Control, Error Detection & Correction, Media Access Protocols: ALOHA, CSMA, CSMA/CD, CSMA/CA. IEEE standards 802: Token Bus, Token Ring, FDDI.

Design Issues of Network Layer: Routing, IPv4: Notation, Classful addressing, Header Format, IPv6 addressing.

UNIT – IV
Design issues of Transport Layer: TCP, UDP
Network Security and Privacy: Brief Introduction to Cryptography.
Network Services: File transfer, Access & Management, Electronic Mail, Remote login.

References/Textbooks:

1. Tanenbaum , A.S., Computer Networks, Prentice Hall, 2010.
2. Stallings, W., Local Networks: An Introduction: Macmillan Publishing Co, 1990.
3. Stallings W., Data and Computer Communications, Prentice Hall, 2011.
4. Forouzan B., Data Communications and networking, McGraw Hill, 2007.

Note: The latest editions of the books should be followed.

Session 2021-22
COURSE CODE: BITL-5112
WEB TECHNOLOGIES

Course Outcomes:

After passing course the student will be able to:

CO1: Understand the basics of websites and use of different markup languages.

CO2: Gain knowledge of different client side technologies.

CO3: Develop single page application through React.

Bachelor of Science (Information Technology) Semester – V

Session 2021-22
COURSE CODE: BITL-5112
WEB TECHNOLOGIES

Examination Time: 3 Hrs.   **Max. Marks: 100**
                                                          Theory: 80
                                                          CA: 20

Instructions for Paper Setter -
Eight questions of equal marks (16 Marks) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT I

Web Essentials – Client/Server Architecture, Web Server, Webpage, Website, Internet, Protocol, OSI model, IP Addresses, Port, HTTP Method, HTTP Response/Request, HTTPS, URL, Browser Architecture, E-mail Protocols, World Wide Web, DNS.

HTML – Basics, Program Structure, Headings, Paragraph, Styling, Formatting, Hyperlink, Image, Table, List, Frame, Block, Entities, Form, Form Elements, Introduction To XHTML.

CSS – Types, Selector, Colors, Background, Box Model, Text, Font, Display, Position, Float, Clear, Rounded Corners.

UNIT - II

JavaScript – Basics, Features, Advantages, Limitations, Types, Basics, Functions, Control Statement, Arrays, JavaScript Objects, Host Objects.

DOM – Introduction, Methods, Accessing HTML and CSS, Events, Event Listener, Nodes and Collection.

BOM – Window, Screen, History, Navigation.

UNIT – III

ES6 – Variables, Arrow functions, Class and Inheritance.

Introduction to React - Render HTML, JSX.

React Components – Web component, Class, Function, Constructor, nested Component.

UNIT IV

Data Handling – Props, Props Validation, State, Fetching Data through API.

Lifecycle of React Components, Form Handling in React, Event Handling in React, React Sass.

References/Textbooks:

1. Jeffery C Jackson, Web Technology- A Computer Science perspective, Pearson Education, 2007.
2. Chris Bates, Web Programming- Building Internet Applications, Wiley India, 2006.
3. Achyut S Godbole and AtulKahate, Web technologies, Tata McGraw Hill, 2002.
4. Uttam K Roy, Web Technologies, Oxford University Press, 2010.
5. KirupaChinnathambi, Learning React, Addison-Wesley Professional, 2019.
6. Alex Banks, Eve Porcello, Learning React: Functional Web Development with React and Redux, O'Reilly Media, 2017.

Note: The latest editions of the books should be followed.

Bachelor of Science (Information Technology) Semester – V

Session 2021-22
COURSE CODE: BITL-5113
OPERATING SYSTEM

Course Outcomes:

After passing course the student will be able to:

CO1: Describe, contrast and compare different types of Operating System.

CO2: Understand the process management policies and CPU scheduling.

CO3: Describe and analyze the memory management and its allocation policies.

CO4: Gain knowledge of operating system concepts that includes virtual memory, mutual exclusion algorithms and deadlock handling.

Bachelor of Science (Information Technology) Semester – V

Session 2021-22
COURSE CODE: BITL-5113
OPERATING SYSTEM

Examination Time: 3 Hrs.

Max. Marks: 100
Theory: 80
CA: 20

Instructions for Paper Setter -
Eight questions of equal marks (16 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT – I
Introduction: Definition, Batch Processing, Multi programming, Time Sharing Systems, Multitasking, multiprocessing, Parallel Systems, Distributed Systems, Real–time Systems.
Processes: Process Concepts, Process Scheduling, Threads, System Calls.

UNIT - II
CPU–Scheduling: Basic concepts, Scheduling Criteria, Scheduling Algorithms, Algorithm Evaluation: Response Time, Turnaround Time, Waiting Time, Throughput.
Process Synchronization: Critical-section problem, semaphores and its Types (Binary and Counting), Classical problems of synchronization and their solutions.

UNIT – III
Deadlocks: System Model, Deadlock characterization, Methods for handing deadlocks, Deadlocks Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock, Approach to Deadlock handling.
Memory Management: Background, Logical v/s Physical Address Space, Swapping, Continuous Allocation, Paging, Segmentation.

UNIT – IV
Virtual Memory: Background, Page Fault, Demand Paging, Page Replacement, Page Replacement Algorithms, Thrashing.
Secondary Storage Structures: Disk structures, Disk scheduling.

References/Textbooks:

1. AviSilberschatz, Peter Baer Galvin, Greg Gagne, Operating System Concepts, Wiley, 2013.

2. Charles Crowley, Operating Systems: A Design-Oriented Approach , Tata McGraw Hill, 2001.

3. Deitel, An Introduction to Operating Systems, Second Edition, Addison Wesley, 1990.

4. William Stallings, Operating Systems: Internals and Design Principles, Pearson Education Limited, 2014.

Note: The latest editions of the books should be followed.

Bachelor of Science (Information Technology) Semester – V

Session 2021-22
COURSE CODE: BITP-5114
LAB ON WEB TECHNOLOGIES

Examination Time: 3 Hrs.   **Max. Marks: 50**
                                                                            Practical: 40
                                                                            CA: 10

Lab on Web Technologies.

Session 2021-22
COURSE CODE: BITP-5115
LAB ON OPERATING SYSTEM

Examination Time: 3 Hrs.   **Max. Marks: 50**
Practical: 40
CA: 10

Lab on Operating System.

Bachelor of Science (Information Technology) Semester – VI
(Session 2021-22)

COURSE CODE: BITL - 6111

COMPUTER GRAPHICS

Course Outcomes:

After passing this course the student will be able to:

CO1: Comprehend the background mechanism involved in display devices like CRT, LCD, LED, etc.

CO2: Comprehend basic concepts involved in drawing basic shapes.

CO3: Implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping, etc.

CO4: Identify the importance of viewing and projections.

Bachelor of Science (Information Technology) Semester – VI
(Session 2021-22)

COURSE CODE: BITL - 6111

COMPUTER GRAPHICS

ExaminationTime: 3 Hrs

Max. Marks: 75
Theory: 60
CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT – I

Overview of Graphics system: Computer Graphics and their applications.

Display Devices: CRT Monitors (Random – Scan and Raster Scan, DVST, Plasma – Panel Display, LED and LCD Monitors, Virtual Reality and Workstation.

UNIT – II

Elementary Drawing: Points and various line drawing Algorithms and their comparisons. Circle generating algorithms, Algorithms for Ellipse, Arc and Sector.

UNIT – III

Two Dimensional Transformations: Basic Transformations - Translation, Rotation, Scaling, Reflection and Shearing. Matrix representation of Basic Transformations and Homogenous Coordinates.

Composite Transformations: Windowing and clipping. Windowing Concepts, Clipping and its Algorithms, Window–to–View Port Transformations.

UNIT - IV

Three Dimensional concepts: 3D Coordinate Systems, 3D Transformations - Translation, Rotation, Scaling, Reflection and Shearing,

Projection: Parallel Projections, Perspective Projection, Vanishing Point, View Confusion and Topological Distortion.

References / Textbooks:

1. Hearn D, Baker P, Computer Graphics, PHI Easter Economy (2002), 2nd Edition.

2. Zhigang Xiang, Plastock R, Kalley G, Computer Graphics, McGraw Hill Education (2006), 2nd Edition.
3. Rajesh K. Maurya, Computer Graphics with Virtual Reality System, Wiley (2018), 3rd Edition
4. Udit Aggarwal, Computer Graphics, SK Katria and Sons (2013), Reprint 2013 Edition
5. Padeep K. Bhatia, Computer Graphics, Dreamtech Press (2019)
6. Andries Van Dam, Foley, Steven, John, Computer Graphics Principles and Practice, Peson Education India (2002), 2nd Edition

COURSE CODE: BITL - 6112

SOFTWARE ENGINEERING

Course Outcomes:

After passing course the student will be able to:

CO1: Identify and evaluate various process model used for development of software.

CO2: Analyze gathered data to form requirement specifications and design modular and /or structured design of a system.

CO3: Identify documentation involved during different phases of system development.

CO4: Apply testing techniques on basic building blocks and control structure.

CO5: Comprehend activities involved in software project management.

Bachelor of Science (Information Technology) Semester – VI
(Session 2021-22)

COURSE CODE: BITL - 6112
SOFTWARE ENGINEERING

ExaminationTime: 3 Hrs

Max. Marks: 75
Theory: 60
CA: 15

Instructions for Paper Setter -

Eight questions of equal marks (12 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT – I

Introduction to Software: Definition, Software characteristics, Software Components, Software Applications.

Introduction to Software Engineering: Definition, Software Engineering Paradigms, Waterfall Model, Prototyping Model, Incremental Model, Spiral Model.

UNIT – II

Requirement, Analysis and Specifications: Problem Analysis, Requirement Gathering Tools (Questionnaire, Interview, Group Discussion, and Observation), SRS Document and its Characteristics, Structured Analysis: Data Flow Diagram, Data Dictionaries.

Software Design: Characteristics, Structure Chart, Coupling, Cohesion, Functional Independence.

UNIT – III

Project Management: SPMP Document, Size Estimation (LOC, Function Point), COCOMO (Basic, Intermediate and Complete COCOMO), Effort Estimation, Development Time Estimation, Project Scheduling (Work Breakdown Structure, Activity Network, Critical Path Method, Gantt Chart, PERT Chart), Staffing.

Risk management and Control, software Maintenance and its types, Software Reuse, Software Reliability.

UNIT – IV

Coding: Coding Standards and Guidelines, Code Walkthrough, Code Inspection.

Testing: Test Case Design, Unit Testing, Black Box Testing (Equivalence Class Partitioning, Boundary Value Analysis), White Box Testing (Statement, Branch, Condition, Path Coverage), Cyclomatic Complexity, Integration Testing, System Testing (Alpha, Beta, Acceptance), Validation And Verification, Performance Testing.

References / Textbooks:

1. Roger S. Pressman, Software Engineering, McGraw-Hill series (2014) , 8th Edition.
2. Pankaj Jalote, A concise introduction to Software Engineering, Wiley (2008).
3. Rajib Mall, Fundamentals of Software Engineering, PHI Learning (2018), 5th Revised Edition
4. Kogent Learning Solutions Inc., Software Engineering, Dreamtech Press (2012)
5. Bruce R.Maxim, Roger S. Pressman, Software Engineering: A Practioner's Approach, McGraw Hill Education (2019), Eighth edition
6. David A. Gustafson, Schaum's Outline of Software Engineering, McGraw Hill (2020), 1st Edition

COURSE CODE: BITP - 6113

LAB ON COMPUTER GRAPHICS

Max. Marks: 50
Practical: 40
CA: 10

ExaminationTime: 3 Hrs

Lab on Applications of Computer Graphics.

Bachelor of Science (Information Technology) Semester – VI
(Session 2021-22)

COURSE CODE: BITD - 6114

PROJECT

Course Outcomes:

After passing course the student will be able to:

CO1: Apply the tools and techniques learnt to frame problems and their corresponding solutions.

CO2: Develop skills necessary to structure, manage and execute projects.

CO3: Learn to work as a member of a cohesive unit.

CO4: Develop presentation skills.

COURSE CODE: BITD - 6114

PROJECT

Max. Marks: 200
Practical: 160
CA: 40

ExaminationTime: 3 Hrs

General Instructions:

1. A software module based on the work done in the entire course is to be developed.

2. The soft copy of the module shall be submitted to the College/Institute till April 5 of the respective semester.

3. The software module shall be developed in groups, consisting of at most two students in a group.

4. The respective college shall depute guide(s)/supervisor(s) under whose supervision the software module shall be developed. The guide/supervisor shall clarify that the work done is original & authenticated. The certificate found to be incorrect at any stage shall attract the proceedings against all the stakeholders, as per rules.

5. The evaluation of the module shall be done as per the common ordinance of UG/PG w.e.f. 2012–2013 under semester system.