



UG PROGRAM (4 Years Honors)

CBCS - 2020-21

B. Sc /B.A
Computer Applications



Syllabus and Model Question Papers



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Note: BOS is to provide final soft copy in PDF and word formats and four copies of hard copies in bounded form to the office of Dean Academic affairs.



RESOLUTIONS OF THE BOARD OF STUDIES

Meeting held on: 22.01.2021. Time:10 A.M At: Adikavi Nannaya University, RJY

Agenda:

1. Adoption of revised-common program structure and revising/updating course - wisesyllabi (in the prescribed format) as per the guidelines issued by APSCHE.
2. Adoption of regulations on scheme of examination and marks/grading system of theUniversity UG programs.
3. Preparation of Model question Courses in prescribed format.
4. List of equipment/software requirement for each lab/practical
5. Eligibility of student for joining the course.
6. Eligibility of faculty for teaching the course.
7. List of Course-setters /Course evaluators with phone, email-id in the prescribed format

Members present:

Dr. P.Venkateshwara Rao	Chairman, Dept. of CSE, ANUR.
Mr.D.Dasu	Coordinator, Dept. of CSE, ANUR
Mrs. P S V D Gayatri	Member, Dept. of CSE, ANUR

Resolutions:

1. Resolved to adopt the revised-common program structure and revising/updating course-wise syllabi (in the prescribed format) as per the guidelines issued by APSCHE.
2. Resolved to adopt the regulations on scheme of examination and marks/gradingsystem of the University UG programs.
3. Resolved to prepare the Model question Courses in prescribed format.
4. Resolved to give the list of equipment/software requirement for each lab/practical
5. Resolved the eligibility of student for joining the course
6. Resolved the eligibility of faculty for teaching the course
7. Resolved to give the list of Course-setters/Course evaluators with phone, email-id inthe prescribed format



ADIKAVI NANNAYA UNIVERSITY:: RAJAHMAHENDRAVARAM
B.Sc /B.A Computer Applications Syllabus (w.e.f:2020 -21 A.Y)

UG Program (4 years Honors) Structure (CBCS)

2020-21 A. Y., onwards

BACHLOR OF SCIENCE

(3rd and 4th year detailed design will be followed as per APSCHE GUIDELINES)

Subjects/ Semesters	I		II		III		IV		V		VI				
	H/W	C	H/W	C	H/W	C	H/W	C	H/W	C	H/W	C			
Languages															
English	4	3	4	3	4	3									
Language (H/T/S)	4	3	4	3	4	3									
Life Skill Courses	2	2	2	2	2+2	2+2									
Skill Development Courses	2	2	2+2	2+2	2	2									
Core Papers															
M-1	C1 to C5	4+2	4+1	4+2	4+1	4+2	4+1	4+2	4+1	4+2	4+1				
M-2	C1 to C5	4+2	4+1	4+2	4+1	4+2	4+1	4+2	4+1	4+2	4+1				
M-3	C1 to C5	4+2	4+1	4+2	4+1	4+2	4+1	4+2	4+1	4+2	4+1				
M-1	SEC (C6,C7)									4+2	4+1	4+2	4+1		
M-2	SEC (C6,C7)									4+2	4+1	4+2	4+1		
M-3	SEC (C6,C7)									4+2	4+1	4+2	4+1		
Hrs/ W (Academic Credits)		30	25	32	27	32	27	36	30	36	30	0	12	4	4
Project Work															
Extension Activities (Non Academic Credits)															
NCC/NSS/Sports/Extra Curricular															
Yoga							1		1						
Extra Credits															
Hrs/W (Total Credits)		30	25	32	27	32	28	36	33	36	30	0	12	4	4

M= Major; C= Core; SEC: Skill Enhancement Courses



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Marks & Credits distribution: UG-Sciences

Sl. No	Course type	No. of courses	Each course teaching Hrs/wk	Credit for each course	Total credits	Each course evaluation			Total marks
						Conti-Assess	Univ-exam	Total	
1	English	3	4	3	9	25	75	100	300
2	S.Lang	3	4	3	9	25	75	100	300
3	LS	4	2	2	8	0	50	50	200
4	SD	4	2	2	8	0	50	50	200
5	Core/SE -I	5+2	4+2	4+1	35	25	75+50	150	1050
	Core/SE -II	5+2	4+2	4+1	35	25	75+50	150	1050
	Core/SE -III	5+2	4+2	4+1	35	25	75+50	150	1050
6	Summer-Intern	2		4	8		100	200	200
7	Internship/ Apprentice/ on the job training	1		12	12		200	200	200
		38			159				4550
8	Extension Activities (Non Academic Credits)								
	NCC/NSS/Sports/ Extra Curricular			2	2				
	Yoga			2	1	2			
	Extra Credits								
	Total			40		142			



DETAILS OF COURSE TITLES & CREDITS

Sem	Course no.	Course Name	Course type (T/L/P)	Hrs/Week (Science: 5+2)	Credits (Science: 4+1)	Max. Marks Cont/ Internal /Mid -Assessment	Max. Marks Sem- end Exam	
I	1	Computer Fundamentals and Office Tools	T	5	4	25	75	
		Computer Fundamentals and Office Tools Lab	L	2	1	-	50	
II	2	Programming in C	T	5	4	25	75	
		Programming in C Lab	L	2	1	-	50	
III	3	Database Management System	T	5	4	25	75	
		Database Management System Lab	L	2	1	-	50	
IV	4	Object Oriented Programming using Java	T	5	4	25	75	
		Object Oriented Programming using Java Lab	L	2	1	-	50	
	5	Web Design	T	5	4	25	75	
		Web Design Lab	L	2	1	-	50	
V	6A	Big data Analytics using R	T	5	4	25	75	
		Big Data Analytics Using R Lab	L	2	1	-	50	
	7A	Data Science using Python	T	5	4	25	75	
		Data Science Using Python Lab	L	2	1	-	50	
	OR							
	6B	Mobile application development	T	5	4	25	75	
		Mobile Application Development Lab	L	2	1	-	50	
	7B	Cyber security and malware analysis	T	5	4	25	75	
		Cyber Security And Malware Analysis Lab	L	2	1	-	50	



OR						
6C	E– commerce application development	T	4	4	25	75
	E– Commerce Application Development Lab	L	2	1	-	50
7C	Real time governance system(RTGS)	T	4	4	25	75
	Real Time Governance System Lab	L	2	1	-	50
OR						
6D	Multimedia Tools and Applications	T	4	4	25	75
	Multimedia Tools and Applications Lab	L	2	1	-	50
7D	Digital imaging	T	4	4	25	75
	Digital Imaging Lab	L	2	1	-	50
OR						
6E	Biological databases and Applications	T	4	4	25	75
	Biological Databases And Applications Lab	L	2	1	-	50
7E	Essentials of Bioinformatics	T	4	4	25	75
	Essentials of Bio Informatics Lab	L	2	1	-	50

Note: *Course type code: T: Theory, L: Lab, P: Problem solving

Note 1: For Semester–V, for the domain subject **Computer Applications**, any one of the above five pairs of SECs shall be chosen as courses 6 and 7, i.e., 6A & 7A or 6B & 7B or 6C & 7C or 6D & 7D or 6E & 7E. The pair shall not be broken (ABCDE allotment is random, not on any priority basis).

Note 2: One of the main objectives of Skill Enhancement Courses (SEC) is to inculcate field skills related to the domain subject in students. The syllabus of SEC will be partially skill oriented. Hence, teachers shall also impart practical training to students on the field skills embedded in the syllabus citing related real field situations.

Note 3: To insert assessment methodology for Internship/ on the Job Training/Apprenticeship under the revised CBCS as per APSCHE Guidelines.

- **First internship (After 1st Year Examinations):** Community Service Project. To inculcate social responsibility and compassionate commitment among the students, the summer vacation in the intervening 1st and 2nd years of study shall be for Community Service Project (the detailed guidelines are enclosed).
- **Credit For Course: 04**



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- **Second Internship (After 2nd Year Examinations):** Apprenticeship / Internship / on the job training / In-house Project / Off-site Project. To make the students employable, this shall be undertaken by the students in the intervening summer vacation between the 2nd and 3rd years (the detailed guidelines are enclosed).
- **Credit For Course: 04**

- **Third internship/Project work (6th Semester Period):**
During the entire 6th Semester, the student shall undergo Apprenticeship / Internship / On the Job Training. This is to ensure that the students develop hands on technical skills which will be of great help in facing the world of work (the detailed guidelines are enclosed).
- **Credit For Course:12**



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- a. Proposed combination subjects:
- b. Student eligibility for joining in the course:
- c. Faculty eligibility for teaching the course:
- d. List of Proposed Skill enhancement courses with syllabus, if any:
- e. Any newly proposed Skill development/Life skill courses with draft syllabus and required resources
- f. Required instruments/software/ computers for the course (Lab/Practical course-wise required i.e., for a batch of 15 students)

Sem. No.	Lab/Practical Name	Names of Instruments/Software/ computers required with specifications	Brand Name	Qty Required
1	Computer Fundamentals and Office Tools Lab	Intel desktop PC(80GB HDD,512MB DDR), Windows OS, MS-Office		15
2	Programming in C Lab	Intel desktop PC(80GB HDD,512MB DDR), Windows OS, C compiler with supporting editors		15
3	Database Management System Lab	Intel desktop PC(80GB HDD,512MB DDR), Windows OS, Oracle 8i/9i or SQL Server, MY SQL		15
4	Object Oriented Programming using Java Lab	Intel desktop PC(80GB HDD,512MB DDR), Windows OS, JDK		15
5	Web Design Lab	Intel desktop PC(80GB HDD,512MB DDR), Windows OS, Web browser, XAMP,MY SQL		15

- g. List of Suitable levels of positions eligible in the Govt/Pvt organizations Suitable levels of positions for these graduates either in industry/govt organization like, technical assistants/ scientists/school teachers, clearly define them, with reliable justification.

S.No	Position	Company/ Govt organization	Remarks	Additional skills required, if any
1	Software Programmer	IT Industry		
2	Software Developer	IT Industry		
3	Software Engineer	IT Industry		
4	Program Manager	IT Industry		
5	Clerk/PO	Banking Industry		
6	IT Specialist	Banking Industry		
7	Teacher/Lecturer/Asst.Prof	Education Institutes		
8	DB Admin	IT Industry/Medical		



- h. List of Govt. organizations / Pvt companies for employment opportunities or internships or projects

S.No	Company/ Govt organization	Position type	Level of Position			
1	Software Development Industry					
2	E-Commerce Industry					
3	Medical Industry					
4	IT Industry					
5	Banking Industry					
6	Education Industry					

- i. Any specific instructions to the teacher /Course setters/Exam-Chief Superintendent

3. PROGRAM OBJECTIVES, OUTCOMES, CO-CURRICULAR AND ASSESSMENT METHODS

B.Sc/B.A	Computer Applications
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1. Aim and objectives of UG program in Subject: Computer Applications

The Objectives of this Program describes what students are expected to know and be able to do by the time of graduation. The Computer Science/Applications Department's Bachelor of Science program must enable students to attain, by the time of graduation:

- An ability to identify, formulate and develop solutions to computational challenges.
- An ability to design, implement and evaluate a computational system to meet desired needs within realistic constraints.
- An ability to function effectively on teams to accomplish shared computing design, evaluation, or implementation goals.
- An understanding of professional, ethical, legal, security, and social issues and responsibilities for the computing profession.
- An ability to communicate and engage effectively with diverse stakeholders.
- An ability to analyze impacts of computing on individuals, organizations, and society.
- Recognition of the need for and ability to engage in continuing professional development.
- An ability to use appropriate techniques, skills, and tools necessary for computing practice.
- Effectively utilizing their knowledge of computing principles and mathematical theory to develop sustainable solutions to current and future computing problems.
- Developing and implementing solution based systems and/or processes that address issues and/or improve existing systems within in a computing based industry.



1. Learning outcomes of Subject Computer Applications:
 - Students will be able to communicate in written and oral forms in such a way as to demonstrate their ability to present information clearly, logically, and critically..
 - Students will be able to apply mathematical and computing theoretical concepts in solution of common computing applications, such as computing the order of an algorithm.
 - Students will be able to complete successfully be able to program small-to-mid- size programs on their own. Sufficient programming skills will require use of good practice, e.g., good variable names, good use of computational units, appropriate commenting strategies.
 - Students will be able to use appropriately system design notations and apply system design engineering process in order to design, plan, and implement software systems
 - In a self-selected area of depth in Computing, students will demonstrate a depth of knowledge appropriate to graduate study and/or lifelong learning in that area. Students should be able to read for understanding materials in that area beyond those assigned in coursework.
 - Students will be prepared for a career in an information technology oriented business or industry, or for graduate study in computer applications or other scientific or technical fields.
 - Use systems development, word-processing, spreadsheet, and presentation software to solve basic information systems problems
2. Recommended Skill enhancement courses: (Titles of the courses given below and details of the syllabus for 4 credits (i.e., 2 units for theory and Lab/Practical) for 5 hrs class-cum-lab work.
3. Recommended Co-curricular activities: (Co-curricular Activities should not promote copying from text book or from others' work and shall encourage self/independent and group learning)

A. Measurable:

1. Assignments
2. Student seminars (Individual presentation of Courses)
3. Quiz Programmes
4. Individual Field Studies/projects
5. Group discussion
6. Group/Team
7. Projects

B. General

1. Collection of news reports and maintaining a record of Course-cuttings relating to topics covered in syllabus
2. Group Discussions
3. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers
4. Any similar activities with imaginative thinking.



5. Recommended Continuous Assessment methods:

Some of the following suggested assessment methodologies could be adopted;

- The oral and written examinations (Scheduled and surprise tests),
- Closed-book and open-book tests,
- Coding exercises,
- Practical assignments and laboratory reports,
- Observation of practical skills,
- Individual and group project reports,
- Efficient delivery using seminar presentations,
- Viva voce interviews.
- Computerized adaptive testing, literature surveys and evaluations,
- Peers and self-assessment, outputs form individual and collaborative work



4. DETAILS OF COURSE-WISE SYLLABUS

B. Sc/B.A	Semester: I	Credits: 4
Course: 1	Computer Fundamentals and Office Tools	Hrs/Wk: 5

Aim and objective of Course:

To introduce the fundamental concepts of Computers, Hardware, Software and able to interact with documentation, Power point and Spreadsheet.

Learning outcomes of Course:

- To learn about Basics of Computers
- To learn about basics of Hardware Components
- To learn about basics of Operating System Software
- To learn about basics of Application System Software
- To practice handful exercises on Documentation, Spreadsheet, Presentation

UNIT I: 12 Hrs

Basics of Computers : Definition of a Computer - Characteristics and Applications of Computers – Block Diagram of a Digital Computer – Classification of Computers based on size and working – Central Processing Unit – I/O Devices.

UNIT II: 12 Hrs

Primary, Auxiliary and Cache Memory – Memory Devices. Software, Hardware, Firmware and People ware – Definition and Types of Operating System – Functions of an Operating System – MS-DOS – MS Windows – Desktop, Computer, Documents, Pictures, Music, Videos, Recycle Bin, Task Bar – Control Panel.

UNIT III: 10 Hrs

MS-Word: Features of MS-Word – MS-Word Window Components – Creating, Editing, Formatting and Printing of Documents – Headers and Footers – Insert/Draw Tables, Table Auto format – Page Borders and Shading – Inserting Symbols, Shapes, Word Art, Page Numbers, Equations – Spelling and Grammar – Thesaurus – Mail Merge.

UNIT, IV: 10 Hrs

MS-PowerPoint: Features of PowerPoint – Creating a Blank Presentation - Creating a Presentation using a Template - Inserting and Deleting Slides in a Presentation – Adding Clip Art/Pictures - Inserting Other Objects, Audio, Video - Resizing and Scaling of an Object – Slide Transition – Custom Animation.

UNIT V: 12 Hrs

MS-Excel: Overview of Excel features – Creating a new worksheet, Selecting cells, Entering and editing Text, Numbers, Formulae, Referencing cells – Inserting Rows/Columns–Changing column widths and row heights, auto format, changing font sizes, colors, shading.

PRESCRIBED BOOKS:

1. Fundamentals of Computers by Reema Thareja, Second Edition, Publishers
2. Oxford University Press, India, ISBN: 9780199499274

REFERENCES BOOKS:

1. Fundamentals of Information Technology Including Lab Work by Vinod Babu Bandari, Publishers : Pearson
2. Fundamentals of Computers by V.Raja Raman, Publishers : PHI
3. Microsoft Office 2010 Bible by John Walkenbach, Herb Tyson, Michael R.Groh and Faithe Wempen, Publishers : Wiley



PRACTICAL SYLLABUS

Course: 1-COMPUTER FUNDAMENTALS AND OFFICETOOLS LAB

List of Experiments for Lab:

WORD:

1. Create curriculum vitae of a graduate
2. Design a visiting card for an Organization
3. Create a letter as the main document and create 5 records for the 5 persons use mail merge to create letter for selected persons among 5.
4. Macro's concept implementation.

SPREADSHEET:

1. Students Marks, Result, Grade & Rank Calculation
2. Number conversions:

Decimal to Octal, Hexa, Decimal, Binary
conversion Binary to decimal, octal, hexa decimal
conversion Octal to decimal, hexa decimal, binary
conversion Hexa decimal to decimal, octal, binary
conversion

Column Chart

Bar Chart

Pie Chart

POWERPOINT:

1. Make a Power point presentation about Social Network.
2. Make a Power point presentation about College.
3. Make a Power point presentation about the given topic.

5. RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Study projects (by very small groups of students on selected local real- time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))



B. General

1. Group Discussion
2. Try to solve MCQ's available online.
3. Others

6. RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Problem-solving exercises,
4. Practical assignments and laboratory reports,
5. Observation of practical skills,
6. Individual and group project reports like "Creating Text Editor in C".
7. Efficient delivery using seminar presentations,
8. Viva voce interviews.
9. Computerized adaptive testing, literature surveys and evaluations,
10. Peers and self-assessment, outputs form individual and collaborative work



MODEL QUESTION COURSE (Sem - End)

B. Sc/B.A DEGREE EXAMINATION

SEMESTER: I

Course 1: COMPUTER FUNDAMENTALS AND OFFICE TOOLS

Time: 3Hrs.

Max. Marks: 75

Section - A

Answer any FIVE question.

5X5 = 25M

1. Write the Applications of Computers.
2. Define and write the types of Operating Systems.
3. Write the Features of MS-Word.
4. Write the Features of MS-Power Point.
5. Write the Features of MS-Excel.
6. Define and write examples for Software, Hardware, Firmware and People ware.
7. Write MS-Word Window Components.
8. Write about Types of effects in Custom Animation.

Section -B

Answer ALL following question

5X10 = 50M

9. a) Write about Classification of Computers based on size and working.

(OR)

- b) Draw the block diagram of Computer and explain the functioning.

10. a) Write about different types of Memory.

(OR)

- b) Explain the functions of Operating System.

11. a) Explain the process of inserting a table and write the properties of table in MS-Word.

(OR)

- b) Write the process of mail merge to prepare progress reports of students in MS-Word.

12. a) Explain the process to inserting, resizing and scaling the objects in MS-Power Point.

(OR)

- b) Write the process to prepare a power point presentation with designs and animations.

13. a) Write the process to prepare students results table using formulae in MS-Excel.

(OR)

- b) What are the types of charts in Excel and write the process to insert a chart?



B. Sc	Semester: II	Credits: 4
Course: 2	PROGRAMMING IN C	Hrs/Wk: 5

Aim and objectives of Course:

This course aims to provide exposure to problem-solving through programming. It introduces the concepts of the C Programming language.

Learning outcomes of Course:

On completing the subject, students will be able to:

- Analyse a given problem and develop an algorithm to solve the problem.
- Understand tokens and control structures in C.
- Understand arrays and strings and implement them.
- Understand the right way of using functions, pointers, structures and unions in C
- Develop and test programs written in C.

UNIT I:

12 Hrs

Introduction to Algorithms: Algorithm - Key features of Algorithms - examples of Algorithms, Flow Charts.

Introduction to C : Structure of C Program, Writing the first C Program , Files used in C Program, Compiling and Executing C Programs, Using Comments, Keywords, Identifiers, Basic Data Types in C, Variables, Constants, I/O Statements in C, Operators in C, Type Conversion and Type Casting.

UNIT II:

16 Hrs

Control and Looping Statements: Introduction to Decision Control Statements, Conditional Branching Statements, Iterative Statements, Nested Loops, Break and Continue Statement, Goto Statement.

Functions: Introduction, using functions – Function declaration/ prototype – Function definition function call – return statement – Passing parameters, Recursive functions.

UNIT III:

16 Hrs

Arrays: Introduction, Declaration of Arrays , Accessing elements of the Array – Storing Values in Array, One dimensional array -declaration, initialization, Accessing one dimensional array, Passing one dimensional array to function, Two dimensional Arrays- declaration, initialization, Accessing two dimensional arrays, passing two dimensional arrays to functions.**Strings:** Introduction, String and Character functions, String Operations using String functions- strcat() , strcmp() , strcpy() , strlen().

UNIT IV:

8 Hrs

Pointers: declaring Pointer Variable, Pointer Expressions and Pointer Arithmetic , Passing Arguments to Functions using Pointers, Memory Allocation in C Programs, Drawbacks of Pointers.

UNIT V:

8 Hrs

Structures: Introduction to structures, Arrays of Structures, Nested Structures.

Union and Enumerated Data Types: Introduction to Union – accessing union elements, Enumerated Data Types.

TEXT BOOKS:

1. Computer Fundamentals and Programming in C by REEMA THAREJA from OXFORDUNIVERSITY PRESS

REFERENCE BOOKS:

1. E Balagurusamy - Programming in ANSI C Tata McGraw-Hill publications.
2. Brain W Kernighan and Dennis M Ritchie - The 'C' Programming language” - Pearson publications.
3. Ashok N Kamthane: Programming with ANSI and Turbo C, Pearson Edition Publications.
4. Yashavant Kanetkar - Let Us 'C' BPB Publications.



PRACTICAL SYLLABUS
Course 2: PROGRAMMING IN C LAB

Details of Lab Syllabus: **Programming in C**

LabList of Experiments

1. Write a C program to calculate the expression: $((a*b)/c)+(a+b-c)$
2. Write a C program to calculate $(a+b+c)^3$.
3. Write a C Program to convert temperature from
 - a. Celsius to Fahrenheit.
 - b. Fahrenheit to Celsius.
4. Write a C program to find roots of quadratic equation.
5. Write a C Program to convert Hours into seconds.
6. Write a C program to Find Biggest of Three numbers.
 - i. Write a C program to read student marks in five subjects and calculate the Total, Average and Grade according to the following conditions:
 - ii. If average ≥ 75 grade is `'_A'`.
 - iii. If average ≥ 60 and < 75 grade is `'_B'`.
 - iv. If average ≥ 50 and < 60 grade is `'_C'`.
 - v. Otherwise grade is `'_D'`.
 - vi. Check that marks in each subject ≥ 35 .
7. Write a C Program to display number of days in given month using Switch – -Case.
8. Write a C Program to check whether a given number is perfect or Not.
9. Write a C program to check whether the given number is Prime or Not.
10. Write a C program to Check whether given number is Palindrome or Not.
11. Write a C Program to check whether a given number is Armstrong or Not.
12. Write a C program to print Fibonacci Series.
13. Write a C program to print multiplication tables up to given range.
14. Write a C program to perform i) Matrix addition ii) Matrix Multiplication.
15. Write a C program to find largest number in the array.
16. Write a C Program to find factorial of a given number using functions.
17. Write a C Program to accept and display Student Details using Structures.
18. Write a C Program to swap two numbers using different parameter passing techniques.



5. RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Study projects (by very small groups of students on selected local real- time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))

B. General

1. Group Discussion
2. Try to solve MCQ's available online.
3. Others

6. RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Problem-solving exercises,
4. Practical assignments and laboratory reports,
5. Observation of practical skills,
6. Individual and group project reports like "Creating Text Editor in C".
7. Efficient delivery using seminar presentations,
8. Viva voce interviews.
9. Computerized adaptive testing, literature surveys and evaluations,
10. Peers and self-assessment, outputs form individual and collaborative work.



MODEL QUESTION COURSE (Sem - End)

B. Sc/B.A DEGREE EXAMINATION

SEMESTER: II

Course 2: PROGRAMMING IN C

Time: 3Hrs.

Max. Marks: 75

Section -A

Answer any FIVE question

5X5 = 25M

1. What is Flow chart and draw the symbols used in flowchart.
2. Write about the conditional branching statements in C.
3. Define Array and write Declaration, initialization and accessing of elements in Array.
4. Write the Drawbacks of Pointers.
5. What the difference between Structure and Union.
6. Write about the basic Data Types used in C.
7. Write about function declaration, definition and calling.
8. Write about Nested Structures.

Section - B

Answer ALL following question

5X10 = 50M

9. a) Explain about the operators in C with examples.

(OR)

- b) Explain the Structure of C program with example.

10. a) Explain about different types of Loops available in C.

(OR)

- b) Explain about Parameter passing techniques with examples.

11. a) Write algorithm and C Program for Matrix multiplication.

(OR)

- b) Explain the String operations using String functions in C.

12. a) Explain about Passing Arguments to Functions using Pointers.

(OR)

- b) Explain about Memory Allocation in C Programs.

13. a) Explain about creating a structure and accessing elements of structure with example.

(OR)

- b) Explain about Enumerated Data Types with example program.



B. Sc/B.A	Semester: III	Credits: 4
Course: 3	DATABASE MANAGEMENT SYSTEM	Hrs/Wk: 5

Aim and objectives of Course:

- To educate student regarding databases and how to manage databases.
- To provide knowledge about creating relationships.
- To provide knowledge about dependencies and relational constraints.
- To enable student to write various types of queries for handling data.

Learning outcomes of Course:

On completing the subject, students will be able to:

- Gain knowledge of Database and DBMS.
- Understand the fundamental concepts of DBMS with special emphasis on relational data model.
- Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database
- Model database using ER Diagrams and design database schemas based on the model.
- Create a small database using SQL.

UNIT I:

12Hrs

Introduction: Data and Information, Characteristics of the Database Approach:

Self-Describing Nature of the a Database System, Insulation between Programs and Data, Data Abstraction, Support of Multiple Views of the data, Sharing of Data and multiuser Transaction Processing, **Actors on the Scene:** Database Administrators, Database Designers, End Users, System Analysts and Application, Advantages of DBMS, **Data Models, Schemas and Instances:** Categories of Data Models, Schemas, Instances, and Database State, **DBMS Architecture and Data Independence:** The Three- Schema Architecture, Data Independence.

UNIT II:

12 Hrs

Entity Relationship Model: Introduction, Entity types, Entity sets, Attributes and Keys, Entities and Attributes, Entity Types, Entity Sets, Keys and Value Sets, Relationships, Relationship types, Roles, and Structural Constraints, Relationship Types, Sets and Instances, Relationship Degree, Role Names, and Recursive Relationships, Constraints on Relationship Types, Attributes of Relationship Types, Weak EntityTypes, ER Diagrams, Naming Conventions, and Design Issues

Enhanced Entity-Relationship: Subclasses, super classes, and inheritance, Specialization and Generalization, Constraints and characteristics of Specialization and Generalization.

UNIT III:

12 Hrs

The relational data model, Relational Constraints: Introduction, Relational Model Concepts, Domains, Attributes, Tuples and Relations, Characteristics of Relations, Relational Model Notation Relational Constraints and Relational **Database Schemas:** Domain Constraints, Key Constraints and Constraints on Null, Relational Databases and Relational Database Schemas, Entity Integrity, Referential Integrity and Foreign Keys **Functional Dependencies and normalization for Relational Databases:** Functional Dependencies, Definition of Functional Dependency, Inference Rules for Functional Dependencies, Equivalence of sets of Functional Dependencies, Minimal Sets of Functional Dependencies, **Normal forms based on primary keys:** Introduction to Normalization, First Normal Form, Second Normal Form, Third Normal Form.

UNIT IV:

12 Hrs

The Relational Algebra: Basic relational Algebra Operation, the SELECT operation, the PROJECT operation, Sequences of Operations and the, RENAME Operation, Set Theoretic Operations, The JOIN Operation, A Complete Set of Relational Algebra Operations, The DIVISION Operation, **Additional Relational Operations:** Aggregate Functions and Grouping, Recursive Closure Operations, OUTER JOIN and OUTER UNION Operations



UNIT V:

12 Hrs

SQL (STRUCTURED QUERY LANGUAGE): Data Definition, Constraints and Schema changes in SQL, The CREATE TABLE Command and SQL Data Types and Constraints, The DROP SCHEMA and DROP TABLE Command, The ALTER TABLE Command, The SELECT-FROM-WHERE Structure of SQL Queries WHERE-Clause , Aggregate Functions and Grouping, Insert, Delete, and Update Statements in SQL, The INSERT Command, The DELETE Command

TEXT BOOKS:

1. "Fundamentals of Database Systems" by R.Elmasri and S.Navathe.
2. "Introduction to Database Management System" Atul Kahate Pearson Education ISBN: 9789332505537.
3. "Database System Concepts" by Abraham Silberschatz, Henry Korth, and S. Sudarshan, McGrawhill, 2010.

REFERENCE BOOKS:

1. "Database Management Systems" by Raghu Ramakrishnan, NcGrawhill,2002
2. "Principles of Database Systems" by J.D.Ullman.
3. "An Introduction to Database Systems" by Bipin C Desai.
4. "Fundamentals of Relational Database Management Systems" byEsakkirajan, Springer PublicationsS.Sumathi, S.



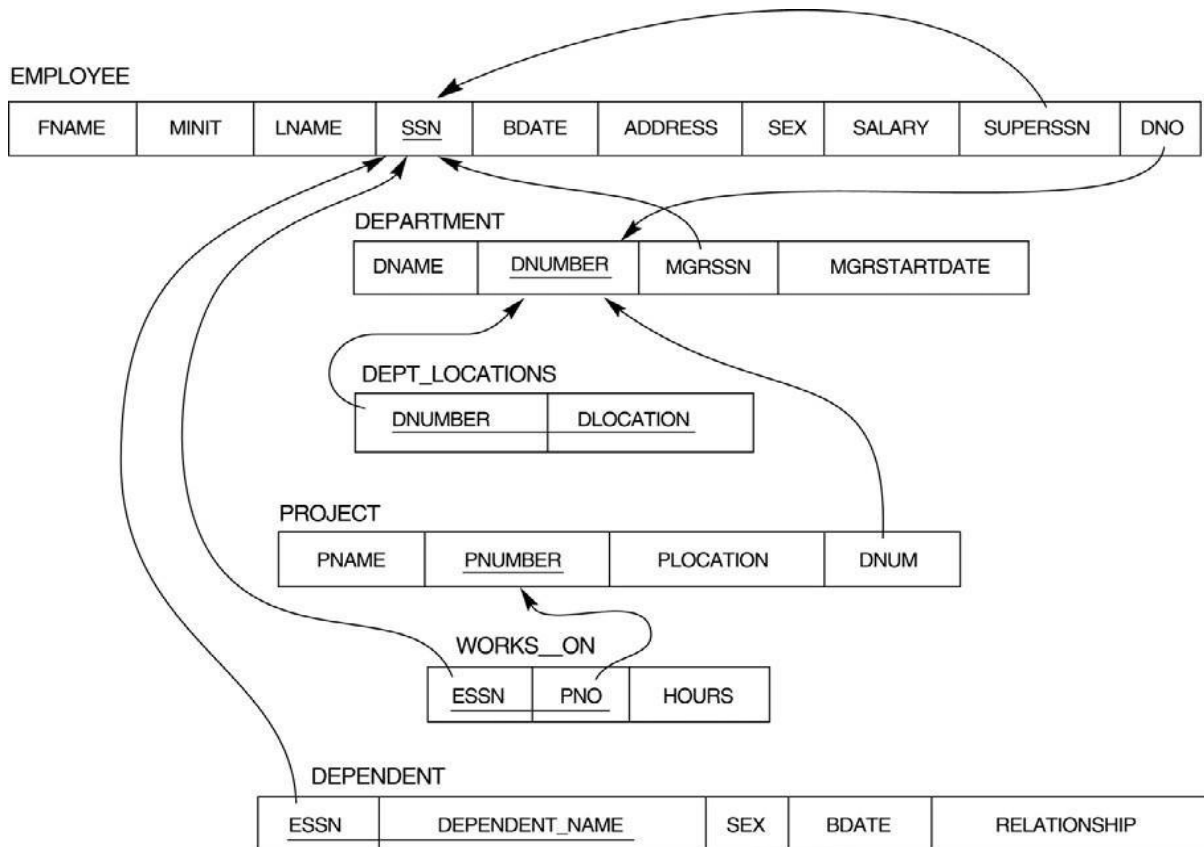
PRACTICAL SYLLABUS

Course 3: DATABASE MANAGEMENT SYSTEM LAB

Details of Lab Syllabus:

1. Draw ER diagram for hospital administration
2. Creation of college database and establish relationships between tables
3. Relational database schema of a company is given in the following figure.

Relational Database Schema - COMPANY



Questions to be performed on above schema

1. Create above tables with relevant **Primary Key, Foreign Key and other constraints**
2. Populate the tables with data
3. Display all the details of all employees working in the company.
4. Display **ssn, lname, fname, address** of employees who work in department no 7.
5. Retrieve the **Birthdate and Address** of the employee whose name is 'Franklin T. Wong'
6. Retrieve the name and salary of every employee
7. Retrieve all distinct salary values



8. Retrieve all employee names whose address is in 'Bellaire'
9. Retrieve all employees who were born during the 1950s
10. Retrieve all employees in department 5 whose salary is between 50,000 and 60,000(inclusive)
11. Retrieve the names of all employees who do not have supervisors
12. Retrieve SSN and department name for all employees
13. Retrieve the name and address of all employees who work for the 'Research' department
14. For every project located in 'Stafford', list the project number, the controlling department number, and the department manager's last name, address, and birth date.
15. For each employee, retrieve the employee's name, and the name of his or her immediate supervisor.
16. Retrieve all combinations of Employee Name and Department Name
17. Make a list of all project numbers for projects that involve an employee whose last name is 'Narayan' either as a worker or as a manager of the department that controls the project.
18. Increase the salary of all employees working on the 'ProductX' project by 15%. Retrieve employee name and increased salary of these employees.
19. Retrieve a list of employees and the project name each works in, ordered by the employee's department, and within each department ordered alphabetically by employee first name.
20. Select the names of employees whose salary does not match with salary of any employee in department 10.



5. RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))

B. General

1. Group Discussion
2. Try to solve MCQ's available online.
3. Others

6. RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Problem-solving exercises,
4. Practical assignments and laboratory reports,
5. Observation of practical skills,
6. Individual and group project reports like "Creating Text Editor in C".
7. Efficient delivery using seminar presentations,
8. Viva voce interviews.
9. Computerized adaptive testing, literature surveys and evaluations,
10. Peers and self-assessment, outputs form individual and collaborative work.



MODEL QUESTION COURSE (Sem - End)

**B. Sc/B.A DEGREE EXAMINATION
SEMESTER: III**

Course 3: DATABASE MANAGEMENT SYSTEM

Time: 3Hrs.

Max. Marks: 75

Section - A

Answer any FIVE question

5X5 = 25M

1. Define Database management systems.
2. What is a Data Model?
3. What is Specialization?
4. What is a Weak Entity?
5. What is referential integrity Constraint?
6. Define Functional Dependency?
7. List out Aggregate Functions
8. Explain SQL Data Types.

Section -B

Answer ALL following question

5X10 = 50M

9. a) What are the characteristics of the Database? Explain the responsibilities of the Actors of the database.
(OR)
b) Explain about the Three-Schema Architecture with the help of a neat diagram.
10. a) Discuss the convention for constructing an ER-diagram along with an example.
(OR)
b) Discuss the Enhanced Entity-Relationship with a suitable example.
11. a) Explain the concepts of relational model with example.
(OR)
b) What is Normalization? Explain 1NF, 2NF, 3NF, BCNF and multivalve dependency.
12. a) Discuss various types of Join operations with examples.
(OR)
b) List the operations of relational algebra and the purpose of each.
13. a) Explain Data Definition Commands with example database and queries for each command.
(OR)
b) Explain Data Manipulation Commands with suitable queries



B. Sc /B.A	Semester: IV	Credits: 4
Course: 4	OBJECT ORIENTED PROGRAMMING USING JAVA	Hrs/Wk: 5

Aim and objectives of Course:

To introduce the fundamental concepts of Object-Oriented programming and to design & implement object oriented programming concepts in Java.

Learning outcomes of Course:

- Understand the concept and underlying principles of Object-Oriented Programming, Understand how object-oriented concepts are incorporated into the Java programming language.
- Implement Object Oriented Programming Concepts (class, constructor, overloading, inheritance, overriding) in java.
- Create and use interfaces in a Java.
- Implement Multithreading, exception handling in Java.
- Create and use packages and applets

UNIT I:

12Hrs

FUNDAMENTALS OF OBJECT – ORIENTED PROGRAMMING: Introduction, Object Oriented paradigm, Basic Concepts of OOP, Benefits of OOP, Applications of OOP, Java features.

OVERVIEW OF JAVA LANGUAGE: Simple Java program structure, Java tokens, Implementing a Java Program, Java Virtual Machine, Command line arguments.

CONSTANTS, VARIABLES & DATATYPES: Constants, Variables, Data Types, Declaration of Variables, Giving Value to Variables, Getting Value of Variables, Operators in Java.

UNIT II:

12Hrs

DECISION MAKING & BRANCHING: Decision making with if statement- Simple if statement, If - Else statement, Nesting of if- else statements, The else if ladder, The switch statement, The conditional operator.

LOOPING: The While statement, The do-while statement, The for statement.

CLASSES, OBJECTS & METHODS: Defining a class, Adding variables, Adding methods, Creating objects, Accessing class members, Constructors, Method overloading, Static members.

UNIT III:

12Hrs

INHERITANCE: Extending a class, Overriding methods, Final variables and methods, Final classes, Abstract methods and classes. **ARRAYS, STRINGS :** Arrays, One-dimensional arrays, Two – dimensional arrays, Strings. **INTERFACES:** Introduction to multiple inheritance, Defining interfaces, Extending interfaces, Implementing interfaces.

UNIT IV:

12Hrs

MULTITHREADED PROGRAMMING: Creating Threads, Extending the Threads, Stopping and Blocking a Thread, Lifecycle of a Thread, Using Thread Methods. **MANAGING ERRORS AND EXCEPTIONS:** Types of errors, Compile-time errors, Run-time errors, Exceptions, Exception handling, Multiple Catch Statements, Using finally statement.

UNIT V:

12Hrs

APPLET PROGRAMMING: Local and remote applets, Applets and Applications, Building Applet code, Applet Life cycle:-Initialization state, Running state, Idle or stopped state, Dead state, Display state. **PACKAGES:** Java API Packages, Creating Packages, Accessing a Package, Using a Package.

TEXT BOOKS:

1. E.Balaguruswamy, Programming with JAVA, A primer, 3e, TATA McGraw-Hill Company.



REFERENCES BOOKS:

1. Core Java: An Integrated Approach, Authored by Dr. R. Nageswara Rao & Kogent Learning Solutions Inc.
2. John R. Hubbard, Programming with Java, Second Edition, Schaum's outline Series, TATA McGraw-Hill Company.
3. Deitel & Deitel. Java TM: How to Program, PHI (2007)
4. Object Oriented Programming Through Java by P. Radha Krishna, Universities Press (2008)



PRACTICAL SYLLABUS
Course 4:OBJECT ORIENTED PROGRAMMING USING JAVA LAB

Details of Lab Syllabus:

1. Java program to generate Harmonic Series ($1/1+1/2+\dots+1/n$).
2. Java program to display even, odd numbers and their sum upto given number n.
3. Java program to find a sub string in the given string.
4. Java program to arrange the given strings in Alphabetic Order.
5. Java program to implement Addition and multiplication of two Matrices.
6. Java program to demonstrate the use of Constructor.
7. Java program to implement method overloading.
8. Java program to demonstrate Method overriding.
9. Java program for single Inheritance.
10. Java program for implementing Interface.
11. Java program on Multiple Inheritance.
12. Java program to implement Threads.
13. Java program to demonstrate Exception handling.
14. Java program to demonstrate Applets.



2. RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))

B. General

1. Group Discussion
2. Try to solve MCQ's available online.
3. Others

3. RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Problem-solving exercises,
4. Practical assignments and laboratory reports,
5. Observation of practical skills,
6. Individual and group project reports like "Creating Text Editor in C".
7. Efficient delivery using seminar presentations,
8. Viva voce interviews.
9. Computerized adaptive testing, literature surveys and evaluations,
10. Peers and self-assessment, outputs from individual and collaborative work.



MODEL QUESTION COURSE (Sem - End)

B. Sc/B.A DEGREE EXAMINATION

SEMESTER: IV

Course 4: OBJECT ORIENTED PROGRAMMING USING JAVA

Time: 3Hrs.

Max. Marks: 75

Section - A

Answer any FIVE question

5X5 = 25M

1. What are the benefits of Object oriented programming?
2. Explain different data types in Java?
3. Describe simple 'if statement' with example?
4. What is overriding method and give one example?
5. Explain one-dimensional array?
6. Write short notes on threads?
7. How to terminate a thread?
8. Explain local and remote applets?

Section - B

Answer ALL following question

5X10 = 50M

9. a) Explain basic concepts of object oriented programming?

(OR)

- b) Discuss different operator in java?

10. a) What is switch statement? and write a program using switch statement?

(OR)

- b) Explain constructors and types of constructors with an example?

11. a) Briefly explain about final, finally and finalize key words?

(OR)

- b) Explain interface with an example?

12. a) Explain life cycle of a thread with example?

(OR)

- b) Discuss different types of exception handlings?

13. a) Explain applet life cycle with an example?

(OR)

- b) Explain java API packages?



B. Sc/B.A	Semester: IV	Credits: 4
Course: 5	WEB DESIGN	Hrs/Wk: 5

Aim and objectives of Course:

To introduce the fundamental concepts of HTML, PHP, MySQL and able to design the web pages using scripting languages.

Learning outcomes of Course:

- To learn about Basic tags in Html.
- To learn about the CSS and Java Script.
- To learn about the Building Blocks of php, functions.
- To learn about working with Forms, Sessions, Cookies.
- To learn about Interacting with MySQL using PHP.

UNIT I: 10 Hrs

Introduction to HTML: Introduction to HTML and World Wide Web, Basic html, Document body, text, Hyperlinks, Adding more formatting Lists, Tables, Images, Multimedia Objects, Frames, Forms.

UNIT II: 13 Hrs

CSS and Java Script: CSS: Introduction, Using Styles: Simple Examples, Defining your own Styles, Properties and Values in Styles, Stylesheets-A worked example, Formatting Blocks of Information, Layers. Java Script: Dynamic HTML, JavaScript-The basics, variables, String manipulation, Mathematical functions, Statements, Operators, Arrays, Functions, Data validation.

UNIT III: 10Hrs

Building blocks of PHP: Variables, Data Types, Operators and Expressions, Constants. Flow Control Functions in PHP: Switching Flow, Loops, Code Blocks and Browser Output. Working with Functions: Defining Functions, Calling functions, returning the values from User Defined Functions, Variable Scope, Saving State between Function calls with the Static statement, more about arguments.

UNIT IV: 14Hrs

Working with Forms: Creating Forms, Accessing Form - Input with User defined Arrays, Combining HTML and PHP code on a single Page, Redirecting the user, Sending Mail on Form Submission, Working with File Uploads. Working with Cookies and User Sessions: Introducing Cookies, Setting a Cookie with PHP, Session Function Overview, Starting a Session, Working with session variables, passing session IDs in the Query String, Destroying Sessions and Unsettling Variables, Using Sessions in an Environment with Registered Users.

UNIT V: 13Hrs

Interacting with MySQL using PHP: MySQL Versus MySQL Function, Connecting to MySQL with PHP, Working with MySQL Data. Creating Database Tables, Creating Menu, Creating Record Addition Mechanism, Viewing Records, Creating the Record Deletion Mechanism, Adding Sub-entities to a Record.

TEXT BOOKS:

1. Chris Bates, Web Programming Building Internet Application, Second Edition, Wiley (2007)
2. Head First Servlets and JSP 2nd Edition, Bryan Basham, Kathy Sierra 3. Uttam Kumar Roy, WebTechnologies from Oxford University Press.
3. Julie C. Meloni, PHP MySQL and Apache, SAMS Teach yourself, Pearson Education (2007).
4. Xue Bai Michael Ekedahl, The web warrior guide to Web Programming, Thomson (2006).



PRACTICAL SYLLABUS

Details of Lab Syllabus: **Web Design Lab**

List of Laboratory Experiments:

HTML

1. Write an HTML program to demonstrate text formatting, working with image and hyperlinks
2. Write an HTML program to create Student Marks sheet preparation.
3. Write an HTML program to explain String manipulation-using functions.
4. Write an HTML program to explain <form> events
5. Write an HTML program to perform all arithmetic operations using java script.
6. Develop a HTML Form, which accepts any Mathematical expression.

PHP Programs

7. Introduction To PHP programming, XAMPP Tool and Dreamweaver Editor Write a Simple Hello Program in PHP by Installing & Configuring XAMPP with Dreamweaver
8. Study Of Basic Building Blocks In PHP Write a Program in PHP for type Casting Of aVariables
9. Study Of Control Structure & Loops In PHP Write a Program In PHP to Display Multiplication Table Using Nested For Loop
10. Study Of Array and Function In PHP Write a program In PHP to Sort an array usingfunction (Bubble Sort)
11. Study Of Form handling In PHP Design a personal Information form , then Submit &Retrieve the Form Data Using \$_GET(), \$_POST() and \$_REQUEST() Variables
12. Study Of Server Side Validation and Page Redirection In PHP Design A Login Form andValidate that Form using PHP Programming
13. Study Of Cookies And Sessions In PHP Create Admin Login, Logout form using sessionvariables.
14. Write a PHP application to add new Rows in a Table.
15. Write a PHP application to modify the Rows in a Table.
16. Write a PHP application to delete the Rows from a Table.
17. Write a PHP application to fetch the Rows in a Table.



MySQL Lab Cycle -Experiments:

Cycle -1:

An Enterprise wishes to maintain the details about his suppliers and other corresponding details. For that, he uses the following details.

Suppliers (sid: Integer, sname: string, address: string)

Parts (pid: Integer, pname: string, color: string)

Catalog (sid: integer, pid: integer, cost: real)

The catalog relation lists the prices charged for parts by suppliers.

Write the following queries in SQL:

1. Find the pnames of parts for which there is some supplier.
2. Find the snames of suppliers who supply every part.
3. Find the snames of supplier who supply every red part.
4. Find the pnames of parts supplied by London Supplier and by no one else.
5. Find the sid's of suppliers who charge more for some part than the average cost of that part.
6. For each part, find the sname of the supplier who charges the most for that part.
7. Find the sid's of suppliers who supply only red parts.
8. Find the sid's of suppliers who supply a red and a green part.
9. Find the sid's of suppliers who supply a red or green part.
10. Find the total amount has to pay for that supplier by part located from London.

Cycle – 2:

An organisation wishes to maintain the status about the working hours made by his employees. For that, he uses the following tables.

Emp (eid: integer, ename: string, age: integer, salary: real)

Works (eid: integer, did: integer, pct_time: integer)

Dept (did: integer, budget: real, managerid: integer)

An employee can work in more than one department; the pct_time field of the works relation shows the percentage of time that a given employee works in a given department.

Resolve the following queries.

11. Print the names and ages of each employee who works in both Hardware and Software departments.
12. For each department with more than 20 full time equivalent employees (i.e., where the part-time and full-time employees add up to at least that many full-time employees), print the did's together with the number of employees that work in that department.
13. Print the name of each employee whose salary exceeds the budget of all of the departments that he or she work in.
14. Find the managerid's of managers who manage only departments with budgets greater than 1,000,000.
15. Find the enames of managers who manage the departments with largest budget.
16. If a manager manages more than one department, he or she controls the sum of all the budgets for those departments. Find the managerid's of managers who control more than 5,000,000.
17. Find the managerid's of managers who control the highest amount.
18. Find the average manager salary.



5. RECOMMENDED CO-CURRICULAR ACTIVITIES:

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A. Measurable

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4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))

5. General

1. Group Discussion
2. Try to solve MCQ's available online.
3. Others

6. RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Problem-solving exercises,
4. Practical assignments and laboratory reports,
5. Observation of practical skills,
6. Individual and group project reports like "Creating Text Editor in C".
7. Efficient delivery using seminar presentations,
8. Viva voce interviews.
9. Computerized adaptive testing, literature surveys and evaluations,
10. Peers and self-assessment, outputs form individual and collaborative work.



MODEL QUESTION COURSE (Sem - End)

B. Sc/B.A DEGREE EXAMINATION

SEMESTER: IV

Course 5: WEB DESIGN

Time: 3Hrs.

Max. Marks: 75

Section - A

Answer any FIVE question

5X5 = 25M

1. What are the applications of World Wide Web?
2. Write the properties and values in Style Sheets.
3. Write about Operators and Expressions in PHP.
4. How to combine HTML and PHP code on a single Page?
5. Write the differences between MySQL and MySQL Function.
6. Write how to insert an image in to a web page using HTML.
7. Write about string manipulation in Java Script.
8. How to Set a Cookie with PHP?

Section - B

Answer ALL following question

5X10 = 50M

9. a) What are the types of Lists, explain with examples.

(OR)

- b) Explain about Forms and Form Controls with example program.

10. a) Explain the types of CSS with examples.

(OR)

- b) Create a Web Form and write java Script code for Data validation in that form.

11. a) Explain about Flow Control Functions in PHP.

(OR)

- b) Explain how to return the values from User Defined Functions with example.

12. a) Write the process how to Send Mail on Form Submission.

(OR)

- b) Explain about passing Session IDs and Destroying Sessions.

13. a) Explain about Connection to MySQL with PHP and Working with MySQL Data..

(OR)

- b) Explain about Creating Record Addition Mechanism.



B. Sc/B.A	Semester – V (Skill Enhancement Course- Elective)	Credits: 4
Course: 6A	Big Data Analytics Using R	Hrs/Wk:5

Learning Outcomes:

Upon successful completion of the course, a student will be able to:

1. Understand data and classification of digital data.
2. Understand Big Data Analytics.
3. Load data in to R.
4. Organize data in the form of R objects and manipulate them as needed.
5. Perform analytics using R programming.

Syllabus: (Total Hours:90 including Theory, Practical, Skills Training, Unit tests etc.)

UNIT I: Introduction to Big data (12 h)

Data, classification Of Digital Data--structured, unstructured, semi-structured data, characteristics of data, evaluation of big data, definition and challenges of big data , what is big data and why to use big data ?, business intelligence Vs big data.

UNIT II: Big data Analytics (10 h)

What is and isn't bigdata analytics? Why hype around big data analytics? , classification of analytics, top challenges facing big data, importance of big data analytics, technologies needed to meet challenges of big data, data science, data scientist.

UNIT III: Introduction to R and getting started with R (13h)

What is R?Why R? , advantages of R over other programming languages, Data types in R-logical, numeric, integer, character, double, complex, raw, coercion, ls() command, expressions, Variables and functions, control structures, Array, Matrix, Vectors, Factors, R packages.

UNIT IV: Exploring data in R (13h)

Data frames-data frame access, ordering data frames, R functions for data frames dim(), nrow(), ncol(), str(), summary(), names(), head(), tail(), edit() .Load data frames—reading from .CSV files, subsetting data frames, reading from tab separated value files, reading from tables, merging data frames.

UNIT V: Data Visualization using R (12h)

Reading and getting data into R (External Data): Using CSV files, XML files, Web Data, JSON files, Databases, Excel files.

Working with R Charts and Graphs: Histograms, Boxplots, Bar Charts, Line Graphs, Scatterplots, Pie Charts



TEXT BOOKS:

1. Seema Acharya ,Subhashini Chellappan --- Big Data And Analytics second edition, Wiley
2. Seema Acharya--Data Analytics using R, McGraw Hill education (India) Private Limited.
3. Big Data Analytics, Introduction to Hadoop, Spark, and Machine-Learning, Raj kamal, Preeti Saxena, McGraw Hill, 2018.
4. Big Data, Big Analytics: Emerging Business intelligence and Analytic trends for Today's Business, Michael Minelli, Michelle Chambers, and AmbigaDhiraj, John Wiley & Sons, 2013

REFERENCE BOOKS:

1. An Introduction to R, Notes on R: A Programming Environment for Data Analysis and Graphics. W. N. Venables, D.M. Smith and the R Development Core Team

RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual andchallenging)
2. Student seminars (on topics of the syllabus and related aspects (individualactivity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups asteam))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity)

B. General

1. Group Discussion
2. Try to solve MCQ's available online.
3. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Problem-solving exercises,
4. Practical assignments and laboratory reports.
5. Observation of practical skills,
6. Individual and group project reports like "Creating Text Editor in C".
7. Efficient delivery using seminar presentations,
8. Viva voce interviews.
9. Computerized adaptive testing, literature surveys and evaluations,
10. Peers and self-assessment, outputs form individual and collaborative work



PRACTICAL SYLLABUS

Course-6A: **Big Data Analytics Using R; Lab**

1. Create a vector in R and perform operations on it.
2. Create integer, complex, logical, character data type objects in R and print their values and their class using print and class functions.
3. Write code in R to demonstrate sum (), min(), max() and seq() functions.
4. Write code in R to manipulate text in R using grep(), toupper(), tolower() and substr() functions.
5. Create a matrix of values in R and perform operations on it.
6. Create a list in R and perform operations on it.
7. Create data frame in R and perform operations on it.
8. Import data into R from text and excel files using read. Table () and read.csv () functions.
9. Write code in R to find out whether number is prime or not.
10. Print numbers from 1 to 100 using while loop and for loop in R.
11. Create a factor in R by specifying levels and print it then modify some values in it.
12. Write a program to import data from csv file and print the data on the console.
13. Write a program to demonstrate histogram in R



MODEL QUESTION COURSE (Sem - End)
B. Sc/B.A DEGREE EXAMINATION
SEMESTER V(Skill Enhancement Course -Elective)
Course 6A: BIGDATA ANALYTICS USING R

Time: 3Hrs.

Max. Marks: 75

Section – A

Answer any FIVE Questions.

5 X 5 = 25M

- 1.Explain business intelligence Vs big data.
2. What is and isn't big data analytics?
3. Explain the advantages of R over other programming languages.
4. Explain the merging data frames.
5. Write in detail about control structures in R.
- 6.Explain the output of ls () command?
7. How to add effects in the project?
8. Why hype around big data analytics?

Section – B

Answer ALL the questions.

5 X 10 = 50M

9. a) Explain about classification of Digital Data and evaluation of big data?
(OR)
b) Define the term Big Data and explain the challenges of big data.
10. a) Explain the importance of big data analytics, technologies needed to meet challenges of big data.
(OR)
b) Explain the classification of analytics?
- 11 a) Give a brief note on Data types in R?
(OR)
b) Explain about Array and R packages in R.
- 12 a) What are Data frames? Explain the R functions for data frames.
(OR)
b) Write how to read from tab separated value files and tables in data frames in R.
- 13 a) Explain the Reading and getting data into R in JSON files.
(OR)
b) Explain how to work with R Charts and Graphs?



B.Sc/B.A	Semester – V (Skill Enhancement Course- Elective)	Credits:4
Course: 7A	Data Science Using Python	Hrs/Wk:5

Learning Outcomes:

Upon successful completion of the course, a student will be able to:

1. Understand basic concepts of data science
2. Understand why python is a useful scripting language for developers.
3. Use standard programming constructs like selection and repetition.
4. Use aggregated data (list, tuple, and dictionary).
5. Implement functions and modules.

Syllabus :(Total Hours: 90 including Theory, Practical, Skills Training, Unit tests etc.)

UNIT I: Introduction to data science (10h)

Data science and its importance, advantages of data science, the process of data science, Responsibilities of a data scientist, qualifications of data scientists, would you be a good data scientist, why to use python for data science.

UNIT II: Introduction to python (14h)

What is python , features of python, history of python, writing and executing the python program, basic syntax, variables, keywords, data types ,operators ,indentation, Conditional statements-if, if-else, nested if-else, looping statements-for, while, nested loops, break, continue, pass

UNIT III: Control structures and strings (13h)

Strings - definition, accessing, slicing and basic operations

Lists - introduction, accessing list, operations, working with lists, functions and methods,

Tuples - introduction, accessing tuple, operations.

Dictionaries - introduction, accessing values in dictionaries, working with dictionaries.

UNIT IV: Functions and modules (12h)

Functions - defining a function, calling a function, types of functions, function arguments, local and global variables, lambda and recursive functions, Modules- math, random, OS, date and time

UNIT V: Pandas (11h)

What is Pandas? Series, Data Frame, Read CSV Files, Analyzing Data Frames, Data Correlations

Data Cleaning: Empty cells, Data in wrong format, Wrong data, Duplicates

Pandas Plotting: plot () method, bar plot, hist plot, box plot, area plot, scatter plot, pie plot.

REFERENCE BOOKS:

1. Steven cooper--- Data Science from Scratch, Kindle edition
2. Reemathareja—Python Programming using problem solving approach, OxfordPublication



RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups a steams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity)

B. General

1. Group Discussion
2. Try to solve MCQ's available online.
3. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Problem-solving exercises,
4. Practical assignments and laboratory reports.
5. Observation of practical skills,
6. Individual and group project reports like "Creating Text Editor in C".
7. Efficient delivery using seminar presentations,
8. Viva voce interviews.
9. Computerized adaptive testing, literature surveys and evaluations,
10. Peers and self-assessment, outputs form individual and collaborative work



PRACTICAL SYLLABUS

Course: 7A .Data Science Using Python Lab

List of Experiments:

1. Python Program to Find the Square Root
2. Python Program to Swap Two Variables
3. Python Program to Generate a Random Number
4. Python Program to Check if a Number is Odd or Even
5. Python Program to Find the Largest Among Four Numbers
6. Python Program to Check Prime Number
7. Python Program to Display the multiplication Table
8. Python Program to Print the Fibonacci sequence
9. Python Program to Check Armstrong Number
10. Python Program to Find the Sum of Natural Numbers
11. Python Program to Make a Simple Calculator
12. Python Program to Find Factorial of Number Using Recursion
13. Python Program to Add Two Matrices
14. Python Program to Multiply Two Matrices
15. Python Program to Check Whether a String is Palindrome or Not
16. Python Program to create a dictionary and print its content.
17. Python program to import data from CSV file using pandas.
18. Python program to demonstrate bar plot.



MODEL QUESTION COURSE (Sem - End)
B. Sc/B.A DEGREE EXAMINATION
SEMESTER V(Skill Enhancement Course -Elective)
Course-7A: DATA SCIENCE USING PYTHON

Time: 3Hrs.

Max. Marks: 75

Section – A

Answer any FIVE Questions.

5X5=25M

- 1.Explain the qualifications of data scientists.
2. Why to use python for data science?
3. Explain the features of python.
- 4.Define strings and how to access it?
5. Define tuple and how to access it?
- 6.What are Data Correlations?
7. How to plot pie plot?
8. What are local and global variables?

Section – B

Answer ALL the questions.

5 X 10 = 50M

9. a) Explain about Data science and its importance?
(OR)
b) Explain about advantages of data science and the process of data science.
10. a) Write a Python Program to Find the Sum of Natural Numbers.
(OR)
b) Write about the looping statements in python with an example?
- 11 a) Explain about Lists and working with lists with an example?
(OR)
b) Explain about dictionaries and working with dictionaries with an example
- 12 a) What is Pandas? Explain analysing the data frames.
(OR)
b) Explain the concept of types of functions in python.
- 13 a) Explain the Reading and getting data into CSV Files.
(OR)
b) Explain the concept of Data Cleaning.



B.Sc/B.A	Semester – V (Skill Enhancement Course- Elective)	Credits:4
Course: 6B	Mobile Application Development	Hrs/Wk:5

Learning Outcomes:

Upon successful completion of the course, a student will be able to:

1. Identify basic terms ,tools and software related to android systems
2. Describe components of IDE, understand features of android development tools
3. Describe the layouts and controls
4. Explain the significance of displays using the given view
5. Explain the features of services and able to publish android Application
6. Developing interesting Android applications using MIT App Inventor

Syllabus :(Total Hours: 90 including Theory, Practical, Skills Training, Unit tests etc.)

UNIT I:

10 Hrs

- Introduction to Android ,open headset alliance, Android Ecosystem
- Need of Android
- Features of Android
- Tools and software required for developing an Application
- Android architecture

UNIT II:

12 Hrs

- operating system, java JDK, Android SDK
- Android development tools
- Android virtual devices
- steps to install and configure Android studio and sdk

UNIT III:

14 Hrs

- control flow, directory structure
- components of a screen
- fundamental UI design
- linear layout, absolute layout , table layout, relative layout
- text view
- edit text
- button, image button, radio button, toggle button
- radio group, check box, and progress bar
- list view, grid view, image view, scroll view
- time and date picker

UNIT IV:

12 Hrs

- android platform services
- Android system Architecture
- Android Security model
- Applications development: creating small application



UNIT V:

12 Hrs

- Introduction of MIT App Inventor
- Application Coding
- Programming Basics & Dialog
- More Programming Basics
- Alarm Clock Application
- Audio & Video
- Drawing Application
- File
- Game
- Device Location
- Web Browsing

TEXT BOOKS:

1. Erik Hellman, “Android Programming – Pushing the Limits”, 1st Edition, Wiley India Pvt Ltd, 2014.
2. App Inventor: create your own Android apps by Wolber, David (David Wayne)

REFERENCE BOOKS:

1. Dawn Griffiths and David Griffiths, “Head First Android Development”, 1st Edition, O’Reilly SPD Publishers, 2015.
2. J F DiMarzio, “Beginning Android Programming with Android Studio”, 4th Edition, Wiley India Pvt Ltd, 2016. ISBN-13: 978-8126565580
3. Anubhav Pradhan, Anil V Deshpande, “ Composing Mobile Apps” using Android, Wiley 2014, ISBN: 978-81-265-4660-2
4. Android Online Developers Guide
5. <http://developer.android.com/reference/> Udacity: Developing Android
6. Apps- Fundamentals
7. <https://www.udacity.com/course/developing-android-appsfundamentals--ud853-nd>
8. <http://www.appinventor.mit.edu/>

RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)



2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity)

B. General

- a. Group Discussion
- b. Try to solve MCQ's available online.
- c. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Problem-solving exercises,
4. Practical assignments and laboratory reports.
5. Observation of practical skills,
6. Efficient delivery using seminar presentations,
7. Viva voce interviews.
8. Computerized adaptive testing, literature surveys and evaluations,
9. Peers and self-assessment, outputs form individual and collaborative work



PRACTICAL SYLLABUS

Course: 6B .Mobile Application Development Lab

Outcomes:

1. Understand the android platform
2. Design and implementation of various mobile applications

Experiments:

1. Demonstrate mobile technologies and devices
2. Demonstrate Android platform and applications overview
3. Implement User interface design layouts
4. Working with texts , shapes, buttons and lists
5. Develop a calculator application
6. Implement an application that creates a alarm clock

Note: The list of experiments need not be restricted to the above list. *Detailed list of Programming/software tool based exercises can be prepared by the concerned faculty members.*



MODEL QUESTION COURSE (Sem - End)

B. Sc/B.A DEGREE EXAMINATION

SEMESTER V(Skill Enhancement Course -Elective)

Course 6B: MOBILE APPLICATION DEVELOPMENT

Time: 3Hrs.

Max. Marks: 75

Section – A

Answer any FIVE Questions.

5X5=25M

1. What is the need of Android?
- 2.Explain open headset alliance?
- 3.Write about operating system.
- 4.Discuss Android activities?
5. Define directory structure.
- 6.What are date pickers?
7. Discuss about Android platform services?
8. What are files?

Section – B

Answer ALL the questions.

5 X 10 = 50M

9. a) Explain about need of Android.

(OR)

- b) Explain about Tools and software required for developing an Application.

10. a) Detailed note on Android development tools.

(OR)

- b) Write about the looping statements in python with an example?

- 11 a) Explain about fundamentals of UI design?

(OR)

- b) Explain about text view.

- 12 a) What is android system architecture?

(OR)

- b) Explain the concept of Android Security model.

- 13 a) Explain the concept of MIT App Inventor

(OR)

- b) Explain the concept of Audio& Video.



B.Sc/B.A	Semester – V (Skill Enhancement Course- Elective)	Credits:4
Course: 7B	Cyber Security And Malware Analysis	Hrs/Wk:5

COURSE OUTCOMES:

Upon successful completion of this course, students should have the knowledge and skills to

1. Understand the computer networks, networking tools and cyber security
2. Learn about NIST Cyber Security Framework
3. Understand the OWASP Vulnerabilities
4. Implement various Malware analysis tools
5. Understand about Information Technology act 2000

Syllabus: (Total Hours: 90 including Theory, Practical, Skills Training, Unit tests etc.)

UNIT I: Introduction to Networks & cyber security

14hrs

- Computer Network Basics
- Computer network types
- OSI Reference model
- TCP/IP Protocol suite
- Difference between OSI and TCP/IP
- What is cyber, cyber-crime and cyber-security
- All Layer wise attacks
- Networking devices: router, bridge, switch, server, firewall
- How to configure: router
- How to create LAN
- Network tools
 - ❖ IP scanner
 - ❖ port scanner
 - ❖ vulnerability scanner
 - ❖ command tools-- net stack, trace route, lookup
 - ❖ tcp view

UNIT II: NIST Cyber security framework

10hrs

- Introduction to the components of the framework
- Cyber security Framework Tiers
- What is NIST Cyber security framework
- Features of NIST Cyber security framework
- Functions of NIST Cyber security framework
- Turn the NIST Cyber security Framework into Reality/ implementing the framework



UNIT III: OWASP

14hrs

- What is OWASP?
- OWASP Top 10 Vulnerabilities
 - ❖ Injection
 - ❖ Broken Authentication
 - ❖ Sensitive Data Exposure
 - ❖ XML External Entities (XXE)
 - ❖ Broken Access Control
 - ❖ Security Misconfiguration
 - ❖ Cross-Site Scripting (XSS)
 - ❖ Insecure Deserialization
 - ❖ Using Components with Known Vulnerabilities
 - ❖ Insufficient Logging and Monitoring
- OWASP Juice Shop
- Web application firewall

UNIT IV: MALWARE ANALYSIS

12hrs

- What is malware
- Types of malware
 - ❖ Key loggers
 - ❖ Trojans
 - ❖ Ran some ware
 - ❖ Rootkits
- Antivirus
- Firewalls
- Malware analysis
 - ❖ VM ware
 - ❖ How to use sandbox
 - ❖ How to create virtual machine
 - ❖ Process explorer
 - ❖ Process monitor
 - ❖ SYS-internals Suite
 - ❖
- SOC-security operations controls - Solar winds (study the tools)
- Network intrusion detection
 - ❖ Wire shark
 - ❖ IDS
 - ❖ IPS
 - ❖ Snort



UNIT V: CYBER SECURITY: Legal Perspectives

10hrs

- Cybercrime and the legal landscape around the world
- Indian IT ACT 2000 --Cybercrime and Punishments
- Weak areas of IT ACT 2000
- Challenges to Indian law and cybercrime scenario in India
- Amendments of the Indian IT Act

TEXT BOOKS:

1. Computer Networks | Fifth Edition | By Pearson (6th Edition) |Tanenbaum, Feamster & Wetherall
2. Computer Networking | A Top-Down Approach | Sixth Edition | By Pearson | Kurose James F. Ross Keith W.
3. Cyber Security by Sunit Belapure, Nina Godbole|Wiley Publications
4. TCP/IP Protocol Suite |Mcgraw-hill| Forouzan| Fourth Edition

WEBSITE REFERENCES:

- <https://csrc.nist.gov/Projects/cybersecurity-framework/nist-cybersecurity-framework-a-quick-start-guide>
- <https://owasp.org/www-project-top-ten/>
- <https://owasp.org/www-project-juice-shop/>

Co-Curricular Activities:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams)Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity)

B. General

1. Group Discussion
2. Try to solve MCQ's available online.

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Practical assignments and laboratory reports,
4. Observation of practical skills,
5. Individual and group project reports.



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6. Efficient delivery using seminar presentations,
7. Viva-Voce interviews.
8. Computerized adaptive testing, literature surveys and evaluations,
9. Peers and self-assessment, outputs form individual and collaborative work



PRACTICAL SYLLABUS
Course: 7B .Cyber Security And Malware Analysis Lab

Learning Objectives:

The purpose of this course is to impart practical understanding on Cyber security and protection of electronic systems and information from malware attacks.

1. Configure a LAN by using a switch
2. Configure a LAN by using Router
3. Steps to attack a victim computer by using "ProRat" Trojan tool
4. Perform the packet sniffing mechanism by download the "wire shark" tool and extract the packets.
5. Perform the task of creating mail messages by using fake mail id by using the "fake mailer" website (<https://emkei.cz>).
6. Perform the IP scanning mechanism by using "tracert" and "arp" commands.
7. Perform the port scanning mechanism by using NMAP tool.
8. Perform an SQL Injection attack and its preventive measure to avoid Injection attack
9. Perform an activity to access a locked computer without knowing the user's password.



MODEL QUESTION COURSE (Sem - End)

B. Sc/B.A DEGREE EXAMINATION

SEMESTER V(Skill Enhancement Course -Elective)

Course 7B: CYBER SECURITY AND MALWARE ANALYSIS

Time: 3Hrs.

Max. Marks: 75

Section – A

Answer any FIVE Questions.

5X5=25M

1. What is cyber, cyber-crime and cyber-security?
2. List out the types of computer networks?
3. Write about the components of the framework.
4. Discuss the functions of NIST cyber security framework?
5. Define OWASP.
6. What is Indian IT ACT 2000?
7. Discuss about Ransomware.
8. Discuss about VM ware.

Section – B

Answer ALL the questions. 5 X 10 = 50M

9. a) Explain the concept of OSI Reference model.

(OR)

- b) Discuss about Networking devices and all layer wise attacks.

10. a) What is NIST Cyber security framework? Explain the features of NIST Cyber security framework

(OR)

- b) Write about the looping statements in python with an example?

- 11 a) Explain about vulnerabilities of OWASP?

(OR)

- b) Explain about web application firewall.

- 12 a) What is Malware analysis? Explain the types of malware.

(OR)

- b) Explain the concept of Antivirus and firewalls.

- 13 a) Explain the concept of Cybercrime and the legal landscape around the world

(OR)

- b) Explain the concept of Challenges to Indian law and cybercrime scenario in India.



B. Sc/B.A	Semester – V (Skill Enhancement Course- Elective)	Credits:4
Course: 6C	E– Commerce Application Development	Hrs/Wk:5

Learning Outcomes:

Upon successful completion of the course, a student will be able to:

1. To apply in an integrative and summative fashion the students' knowledge in all fields of business studies by drafting a website presence plan.
2. To understand the factors needed in order to be a successful in ecommerce
3. To gain the skills to bring together knowledge gathered about the different components of building a web presence
4. To critically think about problems and issues that might pop up during the establishment of the web presence
5. To apply Word Press as a content management system (CMS), Plan their website by choosing colour schemes, fonts, layouts, and more

Syllabus :(Total Hours: 90 including Theory, Practical, Skills Training, Unit tests etc.)

UNIT I :

(10h)

- Introduction to E– commerce:
- Meaning and concept – E– commerce
- E– commerce v/s Traditional Commerce
- E– Business & E– Commerce – History of E– Commerce
- EDI – Importance, features & benefits of E– Commerce
- Impacts, Challenges & Limitations of E– Commerce

UNIT II:

(12h)

- Business models of E – Commerce: Business to Business
- Business to customers
- Customers to Customers
- Business to Government
- Business to Employee
- E – Commerce strategy
- Influencing factors of successful E– Commerce
- Architectural framework of Electronic Commerce
- Web based E Commerce Architecture.
- Internet Commerce

UNIT III:

(12h)

- Electronic data Interchange (EDI: Definitions: Examples
- EDI Technology
- EDI- Communications
- Implementation
- EDI Agreements –
- Security Purchasing Online
- E– Commerce payment system.
- Digital Economy



UNIT IV: (14h)

- A Page on the web - HTML Basics
- Client Side scripting -JAVA SCRIPT basics
- Server side Scripting- PHP basics.
- The elements of e-commerce: Internet e-commerce security
- A web site Evaluation Model

UNIT V: (12h)

- Logging in to Your Word press Site
- word press dash board
- creating your first post
- adding photos and images
- creating hyper link
- adding categories and tags
- changing your theme
- editing an existing post
- usage of E-commerce plug-in such as Woo Commerce

TEXT BOOKS:

1. Turban, Rainer, and Potter, Introduction to E-Commerce, second edition, 2003
2. H. M. Deitel, P. J. Deitel and T. R. Nieto, E-Business and E-Commerce: How to Programe, Prentice hall, 2001
3. WordPress All-in-One For Dummies -written by Lisa Sabin Wilson with contributions by Michael Torbert, Andrea Rennick, Cory Miller, and Kevin Palmer

REFERENCE BOOKS:

1. Elias. M. Awad, "Electronic Commerce", Prentice-Hall of India Pvt Ltd.
2. RaviKalakota, Andrew B. Whinston, "Electronic Commerce-A Manager's guide", Addison-Wesley
3. <https://w3cschools.com>
4. David Whiteley, E-Commerce: Strategy, Technologies and Applications, Tata McGraw Hill.

RECOMMENDED CO-CURRICULAR ACTIVITIES: (Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))



B. General

1. Group Discussion
2. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Efficient delivery using seminar presentations,
4. Computerized adaptive testing, literature surveys and evaluations,
5. Peers and self-assessment, outputs form individual and collaborative work



PRACTICAL SYLLABUS

Course: 6C .E– Commerce Application Development Lab

Case study of e –commerce

1. Home page design of web site
2. Validation using PHP
3. Implement Catalog design
4. Implement Access control mechanism(eg: username and password)
5. Implement Session management (php session management)
6. Implement Shopping cart
7. Case study on business model of bookstore

Note: The list of experiments need not be restricted to the above list. *Detailed list of Programming/software tool based exercises can be prepared by the concerned faculty members.*



MODEL QUESTION COURSE (Sem - End)

B. Sc/B.A DEGREE EXAMINATION

SEMESTER V(Skill Enhancement Course -Elective)

Course-6C: E-COMMERCE APPLICATION DEVELOPMENT

Time: 3Hrs.

Max. Marks: 75

Section – A

Answer any FIVE Questions.

5X5=25M

1. Distinguish between E-Business and E-Commerce.
2. Write about the history of Ecommerce.
3. Write about E-Commerce Strategy.
4. What are the influencing factors of Successful E-Commerce?
5. Write about Digital Economy.
6. Write about the design structure of HTML page.
7. Write about variables in PHP.
8. Write about Word press dash board.

Section – B

Answer ALL the questions.

5 X 10 = 50M

9. a) Explain about EDI importance, features & benefits of E-Commerce.
(OR)
b) Write about Impacts, Challenges and Limitations of E-Commerce.
10. a) Explain about the Business models of E-Commerce.
(OR)
b) Explain about Architectural framework of Electronic Commerce.
- 11 a) Write about EDI Communication, Implementation and Agreements.
(OR)
b) Explain about E-Commerce payment system.
- 12 a) Explain about validation in java script with example.
(OR)
b) Explain about A web site evaluation model.
- 13 a) Explain about adding photos, editing an existing post in word press..
(OR)
b) Explain the usage of E-Commerce plug-in with example.



B.Sc/B.A	Semester – V (Skill Enhancement Course- Elective)	Credits:4
Course: 7C	Real Time Governance System	Hrs/Wk:5

COURSE OUTCOMES:

Upon successful completion of this course, students will have the knowledge and skills to

1. Understand the terms regarding Governance, E-Governance and RTGS
2. Learn about E-Governance Infrastructure
3. Understand the E-Governance implementation in several countries
4. Understand the E-Governance implementation in several Indian states
5. Understand the applications of RTG

Syllabus: (Total Hours: 90 including Theory, Practical, Skills Training, Unit tests etc.)

UNIT I: Introduction to E-Governance

12hrs

- Government, Governance and Good Governance
- What is E-Governance or Electronic Governance?
- E-Government and E-Governance: A conceptual Analysis
 - ❖ Objectives
 - ❖ Components
 - ❖ application domains
 - ❖ four phase model
 - ❖ implementing E-Governance
 - ❖ issues while implementing E-Governance
 - ❖ Opportunities and challenges
- Types of E-Governance
- What is Real-Time Governance (RTG)
- Real Time Governance Society (RTGS)

UNIT II: E-Governance Infrastructure

15hrs

- Data Systems infrastructure
 - ❖ Executive Information Systems
 - ❖ Management Information Systems
 - ❖ Knowledge Management Systems
 - ❖ Transaction Processing Systems
- Legal Infrastructural preparedness
 - ❖ IT Act 2000
 - ❖ Challenges to Indian law and cybercrime scenario in India
 - ❖ Amendments of the Indian IT Act
- Institutional Infrastructural preparedness
 - ❖ Internet
 - ❖ intranet
 - ❖ extranet
- Human Infrastructural preparedness
 - ❖ Top-level management
 - ❖ Middle-level management



- ❖ Low-level management
- ❖ Human Resource Management System
- Technological Infrastructural preparedness
 - ❖ Information and communications technology
 - ❖ Data Warehousing
 - ❖ Cloud Computing
 - ❖ Data Farms

UNIT III: E-Governance: Country Experience **11hrs**

- US
- UK
- AUSTRALIA
- NEW ZELAND
- INDIA
- DUBAI

UNIT IV: E-Governance in India **11hrs**

- Andhra Pradesh
- Karnataka
- Kerala
- Uttar Pradesh
- Madhya Pradesh
- West Bengal
- Gujarat
- Od

UNIT V: Latest Applications in Real Time Governance **11hrs**

- Agriculture
- Rural Development
- Health care
- Education
- Tourism
- Commerce and Trade

TEXT BOOKS:

1. E-Governance: concepts and case studies| CSR Prabhu| Prentice-Hall|
2. E-Governance| Niranjani, Sanhari Mishra | Himalaya Publishing House

WEBSITE REFERENCES:

1. <http://www.egov4dev.org/success/case/>
2. <https://vikaspedia.in/e-governance/resources-for-vles>
3. <https://altametrics.com/en/information-systems/information-system-types.html>
4. <https://core.ap.gov.in/CMDashBoard/Index.aspx>



Co-Curricular Activities:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))

B. General

1. Group Discussion
2. Try to solve MCQ's available online.

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Practical assignments and laboratory reports,
4. Observation of practical skills,
5. Individual and group project reports.
6. Efficient delivery using seminar presentations,
7. Viva-Voce interviews.
8. Computerized adaptive testing, literature surveys and evaluations,
9. Peers and self-assessment, outputs form individual and collaborative work



PRACTICAL SYLLABUS

Course: 7C. Real Time Governance System Lab

Note: Here the students have to gather the details in computer lab by surfing several websites & Google search engines and submit the report to the class/lab instructor before leaving the lab.

- Week 1: Write a Report on the role of Nationwide Networking in E-Governance
- Week 2: Write a Report on SETU: A Citizen Facilitation Centre in India, regarding its successful or failure journey.
- Week 3: Write a Report on National Cyber Security Policy, how it is useful to Indian citizens.
- Week 4: Write a Report on mee-seva/Village Secretariat/Ward secretariat, a new paradigm in citizen services.
- Week 5: Write a Report on any “State Data Centre (SDC)”: Regarding the features, key applications, etc.
- Week 6: Write a Report on how Andhra Pradesh is implementing RTGS in Agriculture.
- Week 7: Write a Report on how Andhra Pradesh is implementing RTGS in social welfare schemes
- Week 8: Write a Report on how Andhra Pradesh is implementing RTGS in waste lands, agricultural lands and house properties.
- Week 9: Write a Report on Electronic Birth Registration in any of the four states of our country.
- Week 10: Write a detailed report on “types of e-governance” with real-life implementation in India with suitable examples.
- Week 11: Write a detailed report on “types of computer networks” available to implement RTGS.
- Week 12: Write a detailed report on ICT concept and its usage in schools and college education.

Website References:

- <http://www.egov4dev.org/success/case/earning>



MODEL QUESTION COURSE (Sem - End)

B. Sc/B.A DEGREE EXAMINATION

SEMESTER V(Skill Enhancement Course -Elective)

Course-7C: REAL TIME GOVERNANCE SYSTEM (RTGS)

Time: 3Hrs.

Max. Marks: 75

Section-A

Answer Any FIVE Questions

5x5=25M

1. Define RTGS
2. Explain about Good Governance
3. Short note on Knowledge Management Systems
4. Define Transaction Processing Systems
5. Define E-Governance in India.
6. What is Cloud Computing
7. Define Data Warehouse
8. Note on Commerce and Trade

Section-B

Answer ALL Questions

5x10=50M

9. a. What is E-Governance? Objectives, Components, application domains?
(OR)
b. Write about the types of Real-Time Governance (RTG).
- 10.a. Write Note on Data Systems Infrastructure, Executive Information Systems and Management Information Systems.
(OR)
b. Explain Legal Infrastructural preparedness and Cyber Crime scenario in India.
- 11.a. Explain E-Governance, Country Experience of US.
(OR)
b. Explain E-Governance: Country Experience of INDIA.
- 12 a. Explain case study E-Governance in India of state Andhra Pradesh.
(OR)
b. Explain case study E-Governance in India of Gujarat state.
- 13.a. Write Applications in Real Time Governance in Agriculture sector?
(OR)
b. Write Applications in Real Time Governance in Education Sector.



B.Sc/B.A	Semester – V (Skill Enhancement Course- Elective)	Credits:4
Course: 6D	Multimedia Tools and Applications	Hrs/Wk:5

Learning Outcomes:

Upon successful completion of the course, a student will be able to:

1. Gain knowledge on the concepts related to Multimedia.
2. Understand the concepts like image data representation and color modes.
3. Understand the different types of video signals and digital audio.
4. Know about multimedia data compression types and audio compression standards
5. Know about basic video compression techniques.

Syllabus: (Total Hours: 90 including Theory, Practical, Skills Training, Unit tests etc.)

UNIT I: Introduction to multimedia: **12Hr**

1. What is Multimedia?
2. Components of Multimedia System
3. Multimedia Research Topics and Projects
4. Multimedia and Hypermedia
5. Multimedia Authoring metaphors
6. Multimedia Production
7. Multimedia Presentation
8. Some Technical Design Issues
9. Automatic Authoring

UNIT II: Image Data Representations and color models: **12Hr**

1. Color science Human vision Image data types:
2. Black & white images
1-bit images (Binary image)
8-bit (Gray-level images)
3. Color images
24-bit color images
8-bit color images
4. Color models

UNIT III: Fundamental concepts in video: **12Hr**

1. Types of Video Signals
Analog Video
Digital Video

Basics of Digital Audio:

2. What is Sound?
Digitization of Sound
Quantization and Transmission of Audio
Pulse code modulation
Differential coding of audio
Predictive coding
DPCM



UNIT IV: Multimedia Data Compression:

12Hr

1. Introduction
- Basics of Information Theory
 - Lossless Compression Algorithms
 - Fix-Length Coding
 - Run-length coding
 - Differential coding
 - Dictionary-based coding
 - Variable Length Coding
 - Shannon-Fano Algorithm
 - Huffman Coding Algorithm

Audio Compression standards:

2. Introduction
 - Psychoacoustics model
 - MPEG Audio

UNIT V: Basic Video Compression Techniques:

12Hr

1. Introduction to Video compression
2. Video Compression with Motion Compensation
3. Video compression standard H.261
4. Video compression standard MPEG-1

TEXT BOOKS:

1. Fundamentals of Multimedia by Ze-Nian Li & Mark S. Drew. Publisher: Prentice Hall

REFERENCE BOOKS:

1. An introduction to digital multimedia by Savage, T. M. and Vogel, K. E. 2008.
2. Digital Multimedia by Nigel Chapman & Jenny Chapman. 2009.

ONLINE RESOURCES:

- <https://ksuit342.wordpress.com/lectuers/>
<https://www.tutorialspoint.com/multimedia>



Recommended Co-Curricular Activities:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))

B. General

1. Group Discussion
2. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Programming exercises,
4. Observation of practical skills,
5. Efficient delivery using seminar presentations,
6. Viva voce interviews.
7. Computerized adaptive testing, literature surveys and evaluations,
8. Peers and self-assessment, outputs form individual and collaborative work

SUGGESTED SOFTWARE

- 1) Image Editing – GIMP
- 2) Audio Editing – Audacity
- 3) Video Editing – video pad
- 4) NCH software tools.



PRACTICAL SYLLABUS
Course: 6D .Multimedia Tools and Applications Lab

List of practical's:

1. Editing images using GIMP
2. Improve the Quality of your Image in GIMP
3. Introduction to Layer Masks. Au
4. Create an impressive background in GIMP
5. Applying Shadow & Highlight effects in images
6. Black& white and color photo conversion.
- 5 Using File Seizer Software for Audio compression.
- 6 Using File seizer Software for Video compression.



MODEL QUESTION COURSE (Sem - End)

B. Sc/B.A DEGREE EXAMINATION

SEMESTER V(Skill Enhancement Course -Elective)

Course-6D: MULTIMEDIA TOOLS AND APPLICATIONS

Time: 3Hrs.

Max. Marks: 75

Section-A

Answer any Five Questions

5x5=25M

1. What is Multimedia?
2. What is Hypermedia?
3. Explain about Automatic Authoring.
4. Write note on Black & white images.
5. Explain Analog Video & Digital Video.
6. Define Digitization of Sound.
7. What is Lossless Compression Algorithms?
8. What is Video Compression?

Section-B

Answer All The Questions

5x10=50M

9. a. What is Multimedia? Components of Multimedia System explain in detail.
(OR)
b. What is Multimedia and Hypermedia Explain Multimedia Authoring metaphors and Multimedia Production.
- 10.a. Explain Black & white images in 1-bit images (Binary image) and 8-bit (Gray-level images)
(OR)
b. Explain about Colour images in 24-bit colour images and 8-bit colour images.
11. a. Explain about Types of Video Signals.
(OR)
b. Define Sound. What is Digitization of Sound Quantization and Transmission of Audio.
12. a. Explain Lossless Compression Algorithms and Fix-Length Coding & Run-length coding?
(OR)
b. Explain about Variable Length Coding 1.3.1 Shannon-Fano Algorithm 1.3.2 Huffman Coding Algorithm.
13. a. Explain the procedure of Video compression standard H.261.
(OR)
b. Explain the procedure of Video compression standard MPEG-1.



B.Sc/B.A	Semester – V (Skill Enhancement Course- Elective)	Credits:4
Course: 7D	Digital Imaging	Hrs/Wk:5

Learning Outcomes:

Upon successful completion of the course, a student will be able to:

- Gain knowledge about Types of Graphics, Types of Objects, Types of video editintools
- Show their skills in editing and altering photographs for through abasic understanding of the tool box.
- Gain knowledge in using the layers.
- Gain knowledge in using the selection tools, repair tools.
- Gain knowledge in using selection tools, applying filters and can show their skills.

Syllabus: (Total Hours: 90 including Theory, Practical, Skills Training, Unit tests etc.)

UNIT I:

12 Hrs

1. Types of Graphics
 - 1.1. Raster vs Vector Graphics
2. Types of Objects
 - 2.1. Audio formats
 - 2.2. Video formats
 - 2.3. Image formats
 - 2.4. Text document formats
3. Types of video editing
4. Different color modes.
5. Image Scanner
 - 5.1 Types of Image Scanners

UNIT II:

12 Hrs

1. What is GIMP?
2. GIMP tool box window
3. Layers Dialog
4. Tool Options Dialog
5. Image window
6. Image window menus

UNIT III:

12 Hrs

Improving Digital Photos

- 1.1. Opening files
 - 1.1.1. Rescaling saving files
- 1.2. Cropping
- 1.3. Brightening & Darkening
- 1.4. Rotating
- 1.5. Sharpening
- 1.6. Fixing Red Eye



Introduction to layers

2. What is layer?
 - 2.1. Using layer to add text
 - 2.2. Using move tool
 - 2.3. Changing colors
 - 2.4. Simple effects on layers
 - 2.5. Linking layers together
 - 2.6. Performing operations on layers
 - 2.7. Using layers to copy and paste
 - 2.8. Tour of layers dialog

UNIT IV:

12 Hrs

Drawing:

- 1.1. Drawing lines and curves
- 1.2. Changing colors and brushes
- 1.3. Erasing
- 1.4. Drawing rectangles
- 1.5. Circles and other shapes
- 1.6. Outlining and filling regions
- 1.7. Filling with patterns and gradients
- 1.8. Importing brushes or gradients or making your own.

Selection:

- 2.1. Working with selections
- 2.2. Select by color and fuzzy
- 2.3. Select Bezier paths
- 2.4. Intelligent scissors tool
- 2.5. Modifying selections with selection modes

UNIT V:

12 Hrs

Erasing and Touching Up:

- 1.1. Dodge and burn tool
- 1.2. Smudging tool
- 1.3. Clone tool
- 1.4. Sharpening using convolve tool
- 1.5. Blurring with Gaussian Blur
- 1.6. Correcting Color Balance
- 1.7. Hue
- 1.8. Saturation
- 1.9. Color balance using curves and levels.

Filters:

- 2.1. Filters
 - 2.1.1. Blur
 - 2.1.2. Enhance
 - 2.1.3. Distort



2.1.4.Noise Filters

REFERENCES :

TEXT BOOK: Beginning GIMP from Novice to professional by Akkana Peck, Second Edition, A press

Recommended Co-Curricular Activities:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))

B. General

1. Group Discussion
2. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Programming exercises,
4. Observation of practical skills,
5. Efficient delivery using seminar presentations,
6. Viva voce interviews.
7. Computerized adaptive testing, literature surveys and evaluations,
8. Peers and self-assessment, outputs form individual and collaborative work



PRACTICAL SYLLABUS
DIGITAL IMAGING Lab

List of Experiments:

1. Designing a Visiting card
2. Design Cover page of a book
3. Paper add for calling tenders
4. Passport photo design
5. Design a Pamphlet
6. Brochure designing
7. Titles designing
8. Custom shapes creation
9. Black & white and color photo conversion
10. Image size modification
11. Background changes
12. Texture and patterns designing
13. Filter effects & Eraser effects



MODEL QUESTION COURSE (Sem - End)

B. Sc/B.A DEGREE EXAMINATION

SEMESTER V(Skill Enhancement Course -Elective)

Course Course-7D: DIGITAL IMAGING

Time: 3Hrs.

Max. Marks: 75

Section – A

Answer any FIVE Questions

5X5=25M

1. List Different Types of Objects and Explain any Two.
2. Define GIMP.
3. List Different Layers of Dialog.
4. Explain the steps for Rescaling saved files.
5. Explain Red eye And Steps to remove Red Eye.
6. Define fuzzy.
7. List different Erasing and Touching tools.
8. List different Noise Filters.

Section – B

Answer ALL The Questions.

5 X 10 = 50M

9. a) Define Graphic ? Explain different types of Graphics in detail?
(OR)
b) Explain different Types of Objects in detail?
10. a) Explain about Image Window and , Image window menus?
(OR)
b) What is GIMP? Explain GIMP Tool Box Window in brief.
11. a) Explain about Cropping functionality, Brightening and Darkening of an image with neat Diagrams?
(OR)
b) Explain the Procedure of Fixing Red eye in detail for an Image?
12. a) Explain about Drawing lines and Curves Drawing Rectangles, Circles and other shapes?
(OR)
b) Explain the Working Procedure with selections Select by Colour and Fuzzy, and Bezier Paths?
13. a) Explain about Dodge and Burn tool , Smudging tool , Clone tool?
(OR)
b) Explain about Filters in detail.



B.Sc/B.A	Semester – V (Skill Enhancement Course- Elective)	Credits:4
Course: 6E	Biological Databases And Applications	Hrs/Wk:5

Learning Outcomes:

Upon successful completion of the course, a student will be able to:

1. To provide a system level understanding of interactions of computers with biological systems.
2. To model the biological macromolecular structures and structure prediction methods
3. To gain knowledge about the methods to characterize and manage different types of biological data

Syllabus : (Total Hours: 90 including Theory, Practical, Skills Training, Unit tests etc.)

UNIT I: (12 h)

Basic concept of open access bibliographic resources related to life sciences, the Significances and the need for such resources, the major content of the databases, how to search and use these resources/databases with special references to PubMed.

UNIT II: (10 h)

Contents and formats of databases entries, retrieval of data using text based search Using ENTREZ, sources of data, method for deposition of data to databases.

UNIT III: (12 h)

Nucleic acid sequence databases, GenBank, EMBL, DDBJ. Protein Sequence Databases: SWISSPROT, Tr-EMBL, PIR-PSD, Genome Databases at NCBI, EBI ,TIGR, SANGER.

UNIT IV: (12 h)

Secondary Structure Prediction of Protein, Tertiary Structure Prediction of Protein, Bioinformatics Perspectives on Human Diseases, Markov and Hidden MarkovModels

UNIT V: (14 h)

Machine Learning Techniques, Algorithms and techniques for Microarray analysis, Medical Informatics, Bioinformatics & systems biology

TEXT BOOKS:

1. Introduction to Bioinformatics – Attwood & Parry-Smith, Pearson Education.
2. Bioinformatics-Methods and applications, Rastogi, S.C.Mendiratta, N. and Rastogi P

REFERENCE BOOKS:

1. Introduction to Bioinformatics – Attwood & Parry-Smith, Pearson Education
2. Bioinformatics- A beginner’s guide by Jean-Michel Claverie, John Wiley & Sons.
3. Structural Bioinformatics by Philip E. Bourne and Helge Weissing, Wiley
4. Bioinformatics-Methods and applications, Rastogi,S.C.Mendiratta, N. and Rastogi P, Prentice-Hallof India Pvt. Ltd, New Delhi
5. Essential Bioinformatics-JinXiong, Cambridge University Press
6. Bioinformatics – Sequence and Genome anlysis, Mount DW, Cold Spring Harbour Laboratory Press, New York
7. Bioinformatics - BaxevanisAD&Quellette BFF, John Wiley & Sons Inc.



REFERENCE LINKS

1. https://www.nature.com/articles/ng1199supp_84b
2. <https://www.coursera.org/learn/machine-learning>

RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

- a. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
- b. Student seminars (on topics of the syllabus and related aspects (individual activity))
- c. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups a steams))
- d. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))

B. General

- a. Group Discussion
- b. Try to solve MCQ's available online.
- c. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Problem-solving exercises,
4. Practical assignments and laboratory reports.
5. Observation of practical skills,
6. Individual and group project reports like "Creating Text Editor in C".
7. Efficient delivery using seminar presentations,
8. Viva voce interviews.
9. Computerized adaptive testing, literature surveys and evaluations,
10. Peers and self-assessment, outputs form individual and collaborative work



PRACTICAL SYLLABUS
Biological Databases and Applications Lab

List of Experiments:

1. Information retrieval from NCBI
2. Demonstration on the possible usage of Gene databases
3. Demonstration of structure and applications of Protein databases
4. Demonstration on sequence alignment (pair wise) using any biological database
5. Demonstration on sequence alignment (MSA) using any biological database
6. Demonstration of various functions/applications on biological databases using BLASTtool.

Note: The list of experiments need not be restricted to the above list. *Detailed list of Programming/software tool based exercises can be prepared by the concerned faculty members.*



MODEL QUESTION COURSE (Sem - End)

B. Sc/B.A DEGREE EXAMINATION

SEMESTER V(Skill Enhancement Course -Elective)

Course-6E: BIOLOGICAL DATABASES AND APPLICATIONS

Time: 3Hrs.

Max. Marks: 75

Section-A

Answer Any FIVE Questions

5X5=25M

1. List major content of the databases.
2. Explain bibliographic resources related to life sciences.
3. Write Contents and formats of databases entries
4. Explain about sources of data
5. Define GenBank, EMBL.
6. List different Markov and Hidden Markov models.
7. Define Machine Learning and it types.
8. Note on Bioinformatics & systems biology

Section-B

Answer ALL The Questions.

5 X 10 = 50M

9. a. Explain about the Significances and the need for such resources, and the major content of the Databases.

(OR)

- b. Illustrate the procedure How to search and use these resources/databases with special references to Pub Med?

- 10.a. Explain the Contents and formats of databases entries, retrieval of data using text based search Using ENTREZ.

(OR)

- b. Explain the method for deposition of data to databases in detail.

- 11.a. Write about GenBank, EMBL, DDBJ?

(OR)

- b. Explain about SWISSPROT, Tr-EMBL, PIR-PSD?

- 12.a. Explain about Secondary Structure Prediction of Protein,

(OR)

- b. Illustrate Bioinformatics Perspectives on Human Diseases.

- 13.a. Define Machine Learning and its types in detail.

(OR)

- b. Explain about Algorithms and techniques for Microarray analysis, Medical Informatics.



B.Sc/B.A	Semester – V (Skill Enhancement Course- Elective)	Credits:4
Course: 7E	Essentials Of Bio Informatics	Hrs/Wk:5

Learning Outcomes:

Upon successful completion of the course, a student will be able to:

1. To get the basic knowledge on the concepts of Bioinformatics and its significance in Biological data analysis.
2. To know the methods to characterise and manage the different types of Biological data.
3. To get insight into the basics of sequence alignment and analysis.
4. To get overview about biological macromolecular structures and structure prediction methods.

Syllabus :(Total Hours: 90 including Theory, Practical, Skills Training, Unit tests etc.)

UNIT I: (12 h)

Introduction: What is Bioinformatics, Goal, Scope, Applications and Limitations Introduction to Biological Databases: What is a Database, types of Databases, biological databases, pitfalls of biological databases, information Retrieval from biological data bases.

UNIT II: (12 h)

Pairwise sequence Alignment-Evolutionary basis, sequence homology versus sequence similarity, sequence similarity versus sequence identity, Global and local alignment methods, scoring matrices, statistical significance of sequence alignment

UNIT III: (14 h)

Database similarity searching- Unique requirements of database searching, heuristic database searching, Basic Local Alignment Search Tool (BLAST), FASTA, comparison of FASTA and BLAST, database searching with Smith-Waterman Method.

UNIT IV: (10 h)

Multiple sequence alignments- clustal-w, Homology modeling, phylogenetic tree construction, applications of sequence alignments.

UNIT V: (12 h)

Gene Prediction- Categories of Gene Prediction programs, Gene Prediction in Prokaryotes, Gene Prediction in Eukaryotes, Protein structure basis-Amino Acids, Secondary Structures, Tertiary Structures, Protein Structure database.

TEXT BOOKS:

1. Essential Bioinformatics-Jinxing, Cambridge University Press

REFERENCE BOOKS:

1. Introduction to Bioinformatics – Attwood & Parry-Smith, Pearson Education.
2. Bioinformatics-Methods and applications, Rastogi,S.C. Mendiratta, N. and Rastogi
3. F. Crick, “Central dogma of molecular biology,” *Nature*, vol. 227 pp. 561-563,1970.



4. P. K. Gupta, "Cell and molecular biology," 5th Edition, *Rastogi Publications*, 2005.
5. J. D. Watson, A. B. Tania, P. B. Stephen, G. Alexander, L. Michael, and L. Richard, "Molecular biology of the gene," 7th Ed, *Pearson Education*, 2017

RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

- a. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
 - b. Student seminars (on topics of the syllabus and related aspects (individual activity))
 - c. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
 - d. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity)

B. General

- a. Group Discussion
- b. Try to solve MCQ's available online.
- c. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Problem-solving exercises,
4. Practical assignments and laboratory reports.
5. Observation of practical skills,
6. Individual and group project reports like "Creating Text Editor in C".
7. Efficient delivery using seminar presentations,
8. Viva voce interviews.
9. Computerized adaptive testing, literature surveys and evaluations,
10. Peers and self-assessment, outputs form individual and collaborative

work



PRACTICAL SYLLABUS

Course: 7E .Essentials of Bioinformatics Lab

1. Demonstration of various functional features of NCBI web page
2. Demonstration on sequence retrieval of a given Gene
3. Demonstration on sequence retrieval of a known Protein
4. Demonstration on sequence alignment of given two sequences.
5. Homology prediction using BLAST
6. Phylogenetic tree construction
7. Protein 2⁰ (secondary) structure prediction by UniProt.

Note: The list of experiments need not be restricted to the above list. *Detailed list of Programming/software tool-based exercises can be prepared by the concerned faculty members.*

Draft Syllabus prepared by:

1. Dr. M. Babu Reddy, Krishna University, Machilipatnam
2. Mr.Kavuri Sridhar, PB Sidhartha College of Arts & Science, Vijayawada
3. Mr. SAB Nehru, Andhra Layola College, Vijayawada



MODEL QUESTION COURSE (Sem - End)

B. Sc/B.A DEGREE EXAMINATION

SEMESTER V(Skill Enhancement Course -Elective)

Course-7E: ESSENTIALS OF BIO INFORMATICS

Time: 3Hrs.

Max. Marks: 75

Section-A

Answer Any FIVE Questions

5 x 5=25M

1. Define Bioinformatics?
2. Define Database and list its types?
3. Note on Alignment-Evolutionary basis?
4. Define FASTA and BLAST?
5. What is Clustal-w explain?
6. Define Homology modelling
7. What is Tertiary Structures?
8. What is Gene Prediction?

Section-B

Answer ALL The Questions.

5 X 10 = 50M

9. a. What is Bioinformatics Explain its , Goal, Scope, Applications and Limitations?
(OR)
b. What is a Database, Explain its types of Databases?
10. a. Define Sequence Homology versus Sequence Similarity, versus Sequence Identity?
(OR)
b. Explain about Global and local alignment methods.
- 11.a. Explain Unique requirements of database searching, heuristic database searching.
(OR)
b. Define Basic Local Alignment Search Tool (BLAST), FASTA, and compare them.
- 12.a. Explain about Multiple Sequence Alignments.
(OR)
b. Illustrate Applications of Sequence Alignments?
- 13.a. Explain about Gene Prediction in Prokaryotes and Gene Prediction in Eukaryotes
(OR)
b. Write about Protein Structure Basis-Amino Acids and Protein Structure Database.