



SRI VIDYA MANDIR ARTS & SCIENCE COLLEGE

(Autonomous)

[An Autonomous College Affiliated to Periyar University, Salem, Tamil Nadu]

[Accredited by NAAC with 'A' Grade with CGPA of 3.27]

[Recognized 2(f) & 12(B) Status under UGC Act of 1956]

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DEGREE OF BACHELOR OF SCIENCE

IN

INFORMATION TECHNOLOGY

CHOICE BASED CREDIT SYSTEM (CBCS)

REGULATIONS AND SYLLABUS FOR

B.SC. INFORMATION TECHNOLOGY PROGRAMME

(SEMESTER PATTERN)

(For Students Admitted in the College from the Academic Year 2023-2024 Onwards)



REGULATIONS AND SYLLABUS FOR B.SC. INFORMATION TECHNOLOGY PROGRAMME

(For Students Admitted in the College from the Academic Year 2023-2024 Onwards)

1. Vision of the Department

To uplift the economically and educationally backward students by developing the personality of the individual, instilling high levels of discipline and preparing them to strive, to set global standards that contributes to the development of the society.

2. Mission of the Department

Impart the knowledge of recent technologies and equip the students with essential skills, technologically make them updated by creating intellectually inspiring environment for Learning, Research, Creativity, Innovation and Professional activities, enable them to become knowledgeable, motivated and resourceful IT professionals.

3. Definitions

(i) **Programme:** Programme means a course of study leading to the award of the degree in a discipline.

(ii) **Course:** Course refers to the subject offered under the Degree Programme.

4. Aim of the Programme

1. Take on leadership positions and embark on a research career in the field.
2. Collaborate in diverse team environments to make positive contributions in the IT field.
3. The Core subjects include latest developments in the education and scientific front, advanced programming packages allied with the discipline topics.
4. To produce graduates who can contribute professionally to the society and widely as IT professionals or entrepreneurs.
5. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
6. Communicate effectively in a variety of professional contexts.
7. Effectively communicating computing concepts and solutions to create and initiate innovation in Computer field.
8. Identify and analyze user needs and to take them into account in the selection, creation, integration, evaluation, and administration of computing based systems.
9. To instill Human, Moral and ethical values in the young minds of the students and thereby improving the total personality of the students.



5. Programme Outcomes (POs)

PO1	Disciplinary knowledge: Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate Programme of study
PO2	Communication Skills: Ability to express thoughts and ideas effectively in writing and orally; Communicate with others using appropriate media; confidently share one's views and express herself/himself; demonstrate the ability to listen carefully, read and write analytically, and present complex information in a clear and concise manner to different groups.
PO3	Critical thinking: Capability to apply analytic thought to a body of knowledge; analyse and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach to knowledge development.
PO4	Problem solving: Capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems, rather than replicate curriculum content knowledge; and apply one's learning to real life situations
PO5	Analytical reasoning: Ability to evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyze and synthesize data from a variety of sources; draw valid conclusions and support them with evidence and examples, and addressing opposing viewpoints.
PO6	Research-related skills: A sense of inquiry and capability for asking relevant/appropriate questions, problem arising, synthesising and articulating; Ability to recognise cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyse, interpret and draw conclusions from data, establish hypotheses, predict cause-and-effect relationships; ability to plan, execute and report the results of an experiment or investigation.
PO7	Cooperation/Team work: Ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team



PO8	Scientific reasoning: Ability to analyse, interpret and draw conclusions from quantitative/qualitative data; and critically evaluate ideas, evidence and experiences from an open-minded and reasoned perspective.
PO9	Reflective thinking: Critical sensibility to lived experiences, with self awareness and reflexivity of both self and society
PO10	Information/digital literacy: Capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of data.
PO11	Self-directed learning: Ability to work independently, identify appropriate resources required for a project, and manage a project through to completion.
PO12	Multicultural competence: Possess knowledge of the values and beliefs of multiple cultures and a global perspective; and capability to effectively engage in a multicultural society and interact respectfully with diverse groups.
PO13	Moral and ethical awareness/reasoning: Ability to embrace moral/ethical values in conducting one's life, formulate a position/argument about an ethical issue from multiple perspectives, and use ethical practices in all work. Capable of demonstrating the ability to identify ethical issues related to one's work, avoid unethical behaviour such as fabrication, falsification or misrepresentation of data or committing plagiarism, not adhering to intellectual property rights; appreciating environmental and sustainability issues; and adopting objective, unbiased and truthful actions in all aspects of work.
PO14	Leadership readiness/qualities: Capability for mapping out the tasks of a team or an organization, and setting direction, formulating an inspiring vision, building a team who can help achieve the vision, motivating and inspiring team members to engage with that vision, and using management skills to guide people to the right destination, in a smooth and efficient way.
PO15	Lifelong learning: Ability to acquire knowledge and skills, including „learning how to learn“, that are necessary for participating in learning activities throughout life, through self-paced and self-directed learning aimed at personal development, meeting economic, social and cultural objectives, and adapting to changing trades and demands of work place through knowledge/skill development/reskilling.



6. Programme Specific Outcomes (PSOs)

PSO1	To enable students to apply basic microeconomic, macroeconomic and monetary concepts and theories in real life and decision making.
PSO2	To sensitize students to various economic issues related to Development, Growth, International Economics, Sustainable Development and Environment.
PSO3	To familiarize students to the concepts and theories related to Finance, Investments and Modern Marketing.
PSO4	Evaluate various social and economic problems in the society and develop answer to the problems as global citizens.
PSO5	Enhance skills of analytical and critical thinking to analyze effectiveness of economic policies.

7. Eligibility for Admission

A candidate who has passed in Higher Secondary Examination with Mathematics or Business Mathematics or Information Technology or Statistics (Academic stream or Vocational stream) as one of the subject under Higher Secondary Board of Examination, Tamilnadu as per norms set by the Government of Tamilnadu or an Examination accepted as equivalent there to by the syndicate, subject to such conditions as may be prescribed there to are permitted to appear and qualify for the B.Sc. degree examination in Information Technology of this Autonomous College affiliated to Periyar University after a course of study of three academic years.

8. Duration of the Programme

The course shall extend over a period of three years comprising of six semesters with two semesters in one academic year. There shall not be less than 90 working days (450 hours) for each semester. Examination shall be conducted at the end of every semester for the respective subjects.

9. Features of Choice Based Credit System

Under Choice Based Credit System (CBCS), a set of Courses consisting of Core Courses, Elective Courses, Skill Based Elective Courses and Non-Major Elective Courses are offered. Beside the Core Courses, which are totally related to the major subject, the students have the advantage of studying supportive papers and Non-Major Courses. This provides enough opportunity to the students to learn not only the major courses but also inter disciplinary and application oriented courses.



10. Syllabus

The syllabus of the B.Sc. Information Technology Degree Programme is divided into the following Courses:

(i) Language Courses:

(ii) Core Courses: The Core Courses are related to the Programme concerned including practicals and project offered under the Programme.

(iii) Elective Courses: There are TWO Elective Courses offered under the Programme related to the Discipline or Generic but are to be selected by the students.

(iv) Skill Enhancement Courses (SEC): This course aims to impart advanced and recent developments in the concerned discipline.

(v) Non-Major Elective (NME): Irrespective of the discipline, the student can select papers that are offered by other disciplines as non-major elective course.

(v) Extra Credit Courses: In order to facilitate the students gaining extra credits, the Extra Credit Courses are offered. According to the guidelines of the UGC, the students are encouraged to avail this option of enriching the knowledge by enrolling themselves in the Massive Open Online Courses (MOOC) provided by various portals, such as SWAYAM, NPTEL, etc.

11. Programme of Study

The Programme of study for the Degree shall be in the Branch – Information Technology (Choice Based Credit System) with internal assessment comprised of instructions in the following subjects according to the syllabi and books prescribed from time to time.

12. Credit

Weightage given to each course of study is termed as Credit.

13. Credit System

The weightage of credits are spread over to four different semesters during the period of study and the cumulative credit point average shall be awarded based on the credits earned by the student. A total of 140 Credits are prescribed for the B.Sc. Information Technology Degree Programme which is the minimum Credit requirement for the three years B.Sc. Information Technology Degree Programme.



SRI VIDYA MANDIR ARTS & SCIENCE COLLEGE

(Autonomous)

Bachelor of Science (B.Sc.) in Information Technology

Programme Pattern and Syllabus (CBCS)

(For Students Admitted in the College from the Academic Year 2023-2024 Onwards)

Sl. No	Part	Nature of Course	Course Code	Name of the Course	Hours/Week	Credits	Marks		
							CIA	ESE	Total
SEMESTER – I									
1	I	Language	23UTA1F01	Foundation Tamil – I / Other Language	6	3	25	75	100
2	II	Language	23UEN1F01	Foundation English – I	6	3	25	75	100
3	III	Core – I	23UIT1C01	C Programming	5	5	25	75	100
4		Core Practical – I	23UIT1P01	C Programming Lab	3	5	25	75	100
5		Elective Course – I (Generic)		Discrete Mathematics - I	4	3	25	75	100
6	IV	SEC – I		NME	2	2	25	75	100
7		FC	23UIT1FC01	Fundamentals of Computers	4	2	25	75	100
Total					30	23	175	525	700
SEMESTER – II									
8	I	Language	23UTA2F02	Foundation Tamil – II / Other Language	6	3	25	75	100
9	II	Language	23UEN2F02	Foundation English - II	6	3	25	75	100
10	III	Core – II	23UIT2C02	Java Programming	5	5	25	75	100
11		Core Practical – II	23UIT2P02	Java Programming & Data Structures Practical	3	5	25	75	100
12		Elective Course – II (Generic)		Discrete Mathematics - II	4	3	25	75	100
13	IV	SEC – II		NME	2	2	25	75	100
14		SEC – III	23UIT2S01	Introduction to HTML	4	2	25	75	100
Total					30	23	175	525	700

**SEMESTER – III**

15	I	Language	23UTA3F03	Foundation Tamil – III / Other Language	6	3	25	75	100
16	II	Language	23UEN3F03	Foundation English - III	6	3	25	75	100
17	III	Core – III	23UIT3C03	RDBMS	5	5	25	75	100
18		Core Practical – III	23UIT3P03	RDBMS- Practical	3	5	25	75	100
19		Elective Course – III (Generic)			5	3	25	75	100
20	IV	SEC – IV	23UIT3S02	Web Designing	2	1	25	75	100
21		SEC – V	23UIT3S03	Office Automation	2	2	25	75	100
22		Common Course		Environmental Studies	1	-			
Total					30	22	175	525	700

SEMESTER – IV

24	I	Language	23UTA4F04	Foundation Tamil – IV / Other Language	6	3	25	75	100
25	II	Language	23UEN4F04	Foundation English - IV	6	3	25	75	100
26	III	Core – IV	23UIT4C04	.Net Programming	5	5	25	75	100
27		Core Practical – IV	23UIT4P04	.Net Programming Lab	3	5	25	75	100
28		Elective Course – IV (Generic)			5	3	25	75	100
29	IV	SEC – VI	23UIT4S04	PHP Programming	2	2	25	75	100
30		SEC – VII	23UIT4S05	Advanced Excel	2	2	25	75	100
31		Common Course	23UES401	Environmental Studies	1	2	25	75	100
Total					30	25	200	600	800

SEMESTER – V

32	III	Core – V	23UIT5C05	Operating System	5	4	25	75	100
33		Core – VI	23UIT5C06	Python Programming	5	4	25	75	100
34		Core Practical – V	23UIT5P05	Python Programming-Lab	3	4	25	75	100
35		Elective		Elective Course – V	5	3	25	75	100



		Course – V							
36		Elective Course – VI		Elective Course – VI	5	3	25	75	100
37		Project	23UIT5PR01	Project with Viva Voce	5	4	25	75	100
38	IV	Value Education	23UVE501	Value Education	2	2	25	75	100
39			23UIT5IN01	Internship	-	2	-	-	-
Total					30	26	175	525	700
SEMESTER – VI									
40	III	Core – VII	23UIT6C07	Data Communication And Networking	7	4	25	75	100
41		Core – VIII	23UIT6C08	Data Mining	6	4	25	75	100
42		Core Practical –VI	23UIT6P06	Data Mining Lab	3	4	25	75	100
43		Elective Course – VII		Elective Course – VII	5	3	25	75	100
44		Elective Course – VIII		Elective Course – VIII	5	3	25	75	100
45	IV	PCSEC SEC - VIII	23UIT6S06	Robotics & its Applications	4	2	25	75	100
46	V		23UEX601	Extension Activities	-	1	-	-	-
Total					30	21	150	450	600
Grand Total					180	140	1050	3150	4200

Note

CBCS – Choice Based Credit system

CIA – Continuous Internal Assessment

ESE – End of Semester Examinations

**Elective Courses****Elective – V**

Semester	Part	Course Code	Name of the Course
V	III	23UIT5E01	Software Metrics
		23UIT5E02	Grid Computing
		23UIT5E03	Fuzzy logic

Elective – VI

Semester	Part	Course Code	Name of the Course
V	III	23UIT5E04	Natural Language Processing
		23UIT5E05	Artificial Neural networks
		23UIT5E06	Cryptography

Elective – VII

Semester	Part	Course Code	Name of the Course
VI	III	23UIT6E07	IoT and its Applications
		23UIT6E08	Artificial Intelligence
		23UIT6E09	Mobile Adhoc Network

Elective – VIII

Semester	Part	Course Code	Name of the Course
VI	III	23UIT6E10	Trends in Computing
		23UIT6E11	Big Data Analytics
		23UIT6E12	Computational Intelligence



Skill Enhancement Courses

Part	Semester	Course Code	Name of the Course	Hours/Week	Credits	Marks		
						CIA	ESE	Total
IV	I		NME	2	2	25	75	100
IV	II		NME	2	2	25	75	100
IV	II	23UIT2S01	Introduction to HTML	2	2	25	75	100
IV	III	23UIT3S02	Web Designing	2	1	25	75	100
	III	23UIT3S03	Office Automation	2	2	25	75	100
IV	IV	23UIT4S04	PHP Programming	2	2	25	75	100
IV	IV	23UIT4S05	Advanced Excel	2	2	25	75	100
IV	VI	23UIT6S06	Robotics & its Applications	4	2	25	75	100

Non Major Elective – (NME)

Extra Disciplinary Subjects offered by the Department of Computer Applications. The department can offer any one of the subjects to the other major subject students in each semester.

Part	Semester	Course Code	Name of the Course	Hours/Week	Credits	Marks		
						CIA	ESE	Total
IV	I	23UIT1N01	Fundamentals of Information Technology	2	2	25	75	100
IV	I	23UIT1N02	Introduction to HTML	2	2	25	75	100
IV	II	23UIT2N03	Multimedia Lab	2	2	25	75	100
IV	II	23UIT2N04	Understanding Internet	2	2	25	75	100



List of Extension Activities

1. National Service Scheme (NSS)
2. Youth Red Cross (YRC)
3. Physical Education (PYE)
4. Eco Club (ECC)
5. Red Ribbon Club (RRC)
6. Women Empowerment Cell (WEC)

14. Break-Up of Marks and Credits

The break-up of marks and credits for the B.Sc. Information Technology Degree Programme is as follows:

Sl. No.	Part	Subject	Marks	Credits
1.	I	Language – Tamil	400	12
2.	II	Language – English	400	12
3.	III	Core Courses – Theory/Practical	1400	64
		Generic Elective Courses – Theory/Practical	400	12
		Discipline Elective Courses	400	12
		Project	100	4
4.	IV	Skill Enhancement Courses (NME)	200	4
		Skill Enhancement Courses	500	9
		Environmental Studies	100	2
		Value Education	100	2
		Foundation Course	100	2
		Professional Competency Skill Enhancement Course	100	2
		Internship / Industrial Training	-	2
5.	V	Extension Activities	-	1
Total			4200	140

- The students are advised to complete a **SWAYAM/MOOC** before the completion of the even semester of each year of study and submit the course completion certificate to the HOD. Two credits will be given to the candidates who have successfully completed.
- The field trip preferably relevant to the course should be undertaken every year.



15. Examinations

The examinations consist of Continuous Internal Assessment (CIA) and end of semester examinations (ESE). The ESE shall be of Three Hours duration for each theory course at the end of every semester. The candidate failing in any course(s) will be permitted to appear for each failed course(s) in the subsequent examination. The end of semester practical examinations shall be of Three Hours for each practical course conducted at the end of every even semester.

To maintain uniformity, particularly for interdepartmental transfer of credits, there shall be a uniform pattern of examination to be adopted by all the teachers offering courses. There shall be three tests, one seminar and one assignment for CIA and ESE during each semester. The distribution of marks for CIA and ESE shall be 25 marks and 75 marks, respectively. Further, the distribution of CIA will be 15 marks for test, 5 marks for assignment and 5 marks for attendance. The average of the highest two test marks out of the three CIA tests will be taken for CIA.

16. Components of Continuous Internal Assessment (CIA)

Components		Marks	Total Marks
Theory			
CIA I	75	(75+75 = 150/10)	25
CIA II	75	15	
Assignment		05	
Attendance		05	
Practical			
CIA		15	25
Practical Observation Notebook		05	
Attendance		05	



17. QUESTION PAPER PATTERN

Bloom's Taxonomy Based Assessment Pattern

(K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate)

(i) Theory Examinations (CIA I & CIA II = 25 Marks and ESE = 75 Marks)

Knowledge Level	Section	Marks	Description	Total Marks
K1	A (Answer ALL) Q1–Q15	$15 \times 1 = 15$	Multiple Choice Questions (MCQ) (Three questions from each unit)	15
K2	B (Answer any THREE out of FIVE) Q16–Q20	$3 \times 5 = 15$	Short Answers (One question from each unit)	15
K3 & K4	C (Either or Pattern) Q20–Q25	$5 \times 9 = 45$	Descriptive/Detailed Answers (Two questions from each unit)	45
Total Marks				75

Passing Minimum (CIA) 40% = 10 Marks

Passing Minimum (ESE) 40% = 30 Marks

40 Marks

(ii) Practical Examinations (CIA = 25 Marks and ESE = 75 Marks)

Knowledge Level	Components	Marks	Total
K3	Experiments	60	75
K4	Record Work	15	
K5			

Passing Minimum (CIA) 40% = 10 Marks

Passing Minimum (ESE) 40% = 30 Marks

40 Marks



The candidate shall be declared to have passed the examination if the candidates secure not less than 30 marks out of 75 marks in the semester examination in each theory course and 10 marks out of 25 marks in the CIA and in total not less than 40 marks.

For the practical course, 30 marks out of 75 marks in the semester examination and the record notebook taken together and 10 marks out of 25 marks in the CIA and in total 40 marks. There is no passing minimum for the record notebook. However, submission of the record notebook is necessary.

Candidate who does not obtain the required minimum marks for a pass in a Course/Practical shall be declared Re-Appear (RA) and the candidate has to appear and pass the same at a subsequent appearance.

18. Maximum Duration for the Completion of the B.Sc. Information Technology Programme

The maximum duration for completion of the B.Sc. Information Technology Programme shall not exceed twelve semesters.

19. Commencement of this Regulation

This regulation and syllabus shall take effect from the academic year 2023–2024 for students who are admitted to the first year of the Programme during the academic year 2023–2024 and thereafter.

20. Grading

Once the marks of the cumulative CIA and ESE are available, they will be added. The marks thus obtained will then be graded as per details given below:

Marks and Grades:

The following table gives the marks grade points, letter grades and classification to indicate the performance of the candidate.

Range of Marks	Grade Points	Letter Grade	Description
90–100	9.0–10.0	O	Outstanding
80–89	8.0–8.9	D+	Excellent
75–79	7.5–7.9	D	Distinction
70–74	7.0–7.4	A+	Very Good



60–69	6.0–6.9	A	Good
50–59	5.0–5.9	B	Average
40–49	4.0–4.9	C	Satisfactory
00–39	0.0	U	Re-appear
ABSENT	0.0	AAA	ABSENT

C_i = Credits earned for course i in any semester

G_i = Grade Point obtained for course i in any semester

n = Semester in which such course were credited

Grade point average (for a Semester):

Calculation of grade point average semester-wise and part-wise is as follows:

$$\text{GRADE POINT AVERAGE [GPA]} = \frac{\sum C_i G_i}{\sum C_i}$$

Sum of the multiplication of grade points by the credits of the courses under each part

$$\text{GPA} = \frac{\text{Sum of the multiplication of grade points by the credits of the courses under each part}}{\text{Sum of the credits of the courses under each part in a semester}}$$

Calculation of Grade Point Average (CGPA) (for the entire programme):

A candidate who has passed all the examinations under different parts (Part – I to V) is eligible for the following part wise computed final grades based on the range of CGPA.

$$\text{CUMULATIVE GRADE POINT AVERAGE [CGPA]} = \frac{\sum_n \sum_i C_{ni} G_{ni}}{\sum_n \sum_i C_{ni}}$$

Sum of the multiplication of grade points by the credits of the entire program under each part

$$\text{GPA} = \frac{\text{Sum of the multiplication of grade points by the credits of the entire program under each part}}{\text{Sum of the credits of the courses of the entire program under each part}}$$



21. Classification of Successful Candidates

A candidate who passes all the examinations and securing following CGPA and Grades shall be declared as follows:

CGPA	GRADE	CLASSIFICATION OF FINAL RESULT
9.5–10.0	O+	First Class – Exemplary
9.0 and above but below 9.5	O	
8.5 and above but below 9.0	D++	First Class with Distinction
8.0 and above but below 8.5	D+	
7.5 and above but below 8.0	D	
7.0 and above but below 7.5	A++	First Class
6.5 and above but below 7.0	A+	
6.0 and above but below 6.5	A	
5.5 and above but below 6.0	B+	Second Class
5.0 and above but below 5.5	B	
4.5 and above but below 5.0	C+	Third Class
4.0 and above but below 4.5	C	

22. Ranking

A candidate who qualifies for the B.Sc. Information Technology, passing all the Examinations in the first attempt within the minimum period prescribed for the Programme from the date of admission to the Programme and secures first or second class shall be eligible for ranking and such ranking will be confined to 10% of the total number of candidates qualified in that particular subject to a maximum of 10 ranks.

23. Conferment of the Degree

No candidate shall be eligible for conferment of the Degree unless he/she has undergone the prescribed Programme of study for a period of not less than six semesters in an Institution approved by and affiliated to the Periyar University and earns has passed the Examinations as have been prescribed.



24. Transitory Provision

Candidates who have undergone the Programme of Study prior to the Academic Year 2023–2024 will be permitted to take the Examinations under those Regulations for a period of six years i.e. up to and inclusive of the Examination of April 2029. Thereafter, they will be permitted to take the Examination only under the Regulations in force at that time.



PROGRAMME SYLLABUS



Programme: B.Sc., Information Technology				
Core – I		Course Code: 23UIT1C01		Course Title: Programming in C
Semester	Hours/Week	Total Hours	Credits	Total Marks
I	5	60	5	100

Course Objectives

1. To understand the nature of C programming.
2. To describe the core syntax and semantics of C programming language.
3. To develop logics which will help to create programs, applications in C.
4. To implement the algorithms and draw flowcharts for solving Mathematical and Engineering problems.
5. To help students to get the practical knowledge of a programming language C.

UNIT – I

Studying Concepts of Programming Languages- Language Evaluation Criteria - Language design - Language Categories - Implementation Methods – Programming Environments - Overview of C: History of C- Importance of C- Basic Structure of C Programs-Executing a C Program- Constants, Variables and Data types - Operators and Expressions - Managing Input and Output Operations

UNIT – II

Decision Making and Branching: Decision Making and Looping - Arrays - Character Arrays and Strings

UNIT – III

User Defined Functions: Elements of User Defined Functions- Definition of Functions- Return Values and their Types- Function Call- Function Declaration- Categories of Functions- Nesting of Functions-Recursion

UNIT – IV Structures and Unions: Introduction- Defining a Structure- Declaring Structure Variables Accessing Structure Members- Structure Initialization- Arrays of Structures- Arrays within Structures- Unions- Size of Structures.

UNIT – V



Pointers: Understanding Pointers- Accessing the Address of a Variable- Declaring Pointer Variables- Initializing of Pointer Variables- Accessing a Variable through its Pointer- Chain of Pointers- Pointer Expressions- Pointer and Scale Factor- Pointer and Arrays- Pointers and Character Strings- Array of Pointers- Pointer as Function Arguments- Functions Returning Pointers- Pointers to Functions- File Management in C

Text Book

1. Robert W. Sebesta, (2012), —Concepts of Programming Languages, Fourth Edition, Addison Wesley (Unit I : Chapter – 1)
2. E. Balaguruswamy, (2010), —Programming in ANSI C, Fifth Edition, Tata McGraw Hill Publications

Reference Books

1. Ashok Kamthane, (2009), —Programming with ANSI & Turbo C, Pearson Education
2. Byron Gottfried, (2010), —Programming with C, Schaums Outline Series, Tata McGraw Hill Publications.

Web Resources

1. <http://www.tutorialspoint.com/cprogramming/>
2. <http://www.cprogramming.com/>
3. <http://www.programmingsimplified.com/c-program-examples>
4. <http://www.programiz.com/c-programming>
5. <http://www.cs.cf.ac.uk/Dave/C/CE.html>
6. <http://fresh2refresh.com/c-programming/c-function/>



Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Outline the fundamental concepts of C programming languages, and its features	K1 & K2
CO2	Demonstrate the programming methodology.	K2 & K3
CO3	Identify suitable programming constructs for problem solving.	K3 & K4
CO4	Select the appropriate data representation, control structures, functions and concepts based on the problem requirement	K3, K4 & K5
CO5	Evaluate the program performance by fixing the errors.	K5

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with Pos

CO/ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	S	M	M	S	M	M
CO2	S	S	M	S	M	M
CO3	S	S	S	S	M	M
CO4	S	S	M	S	M	M
CO5	S	S	M	S	M	M

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
Core Practical – I		Course Code: 23UIT1P01		Course Title: Programming in C Lab
Semester	Hours/Week	Total Hours	Credits	Total Marks
I	3	45	5	100

Course Objectives

1. The Course aims to provide exposure to problem-solving through C programming
2. It aims to train the student to the basic concepts of the C -Programming language.
3. Apply different concepts of C language to solve the problem

List of Programs

1. Programs using Input/ Output functions
2. Programs on conditional structures
3. Command Line Arguments
4. Programs using Arrays
5. String Manipulations
6. Programs using Functions
7. Recursive Functions
8. Programs using Pointers
9. Files
10. Programs using Structures & Unions



Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Demonstrate the understanding of syntax and semantics of C programs.	K1, K2 &K3
CO2	Identify the problem and solve using C programming techniques	K2 & K3
CO3	Identify suitable programming constructs for problem solving.	K3 & K4
CO4	Analyze various concepts of C language to solve the problem in an efficient way.	K4 &K5
CO5	Develop a C program for a given problem and test for its correctness	K5&K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with Pos

CO/ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	S	M	M	S	M	M
CO2	S	S	M	S	M	M
CO3	S	S	S	S	M	M
CO4	S	S	M	S	M	M
CO5	S	S	M	S	S	M

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
FC – Foundation Course		Course Code:		Course Title:
				Fundamentals of Computers
Semester	Hours/Week	Total Hours	Credits	Total Marks
I	4	30	2	100

Course Objectives

1. To analyze a problem with appropriate problem solving techniques.
2. To understand the main principles of imperative, functional and logic oriented programming languages.
3. To increase the ability to learn new programming languages..

UNIT – I

Introduction: Characteristics of Computers - Evolution of Computers Basic Computer Organization: I/O Unit - Storage Unit - Arithmetic Logic Unit - Control Unit - Central Processing Unit

UNIT – II

Computer Software: Types of Software - System Architecture Computer Languages: Machine Language - Assembly Language - High Level Language - Object Oriented Languages

UNIT – III

Problem Solving Concepts: Problem Solving in Everyday life - Types of Problems - Problem solving with computers - Difficulties with Problem Solving

UNIT – IV

Problem Solving concepts for the computer: Constant Variables - Data Types - Functions - Operators - Expressions and Equations - Organizing the Solution: Analyzing the problem - Algorithm - Flowchart - Pseudo code

UNIT – V

Programming Structure: Structuring a solution - Modules and their function - Local and Global variables - Parameters - Return values - Sequential Logic Structure - Problem solving with Decision - Problem Solving with Loops.

**Text Books**

1. Pradeep K.Sinha and Priti Sinha, (2004) —Computer Fundamentals, Sixth Edition, BPB Publications. (Unit I : Chapter 1 & 2, Unit II : Chapter 10 & 12)
2. Maureen Sprankle and Jim Hubbard, (2009) —Problem Solving and Programming Concept, Ninth Edition, Prentice Hall. (Unit III: Chapter 1,2 &3) Unit IV : Chapter 3, Unit V : Chapter 4,5 ,6,7 & 8)

Reference Book:

1. R.G. Dromey, (2007), —How to Solve it by Computer, Prentice Hall International Series in Computer Science.
2. C. S. V. Murthy, (2009), —Fundamentals of Computers, Third Edition, Himalaya Publishing House.

Reference Websites

1. http://www.tutorialspoint.com/computer_fundamentals/
2. <http://www.comptechdoc.org/basic/basicitut/>
3. <http://www.homeandlearn.co.uk/>
4. <http://www.top-windows-tutorials.com/computer-basics/>
5. <https://www.programiz.com/article/flowchart-programming> (Algorithm and flow chart)



Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Outline the Computer fundamentals and various problem solving concepts in Computers	K1 & K2
CO2	Describe the basic computer organization, software, computer languages, software development life cycle and the need of structured programming in solving a computer problem	K2 & K5
CO3	Identify the types of computer languages, software, computer problems and examine how to set up expressions and equations to solve the problem.	K1, K2, K3 & K4
CO4	Choose most appropriate programming languages, constructs and features to solve the problems in diversified domains.address	K5 & K6
CO5	Analyze the design of modules and functions in structuring the solution and various Organizing tools in problem solving.	K4 & K5

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with Pos

CO/ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	S	M	M	M	M	S
COM	S	M	M	M	S	M
CO3	S	S	S	S	M	M
CO4	S	M	M	M	M	S
CO5	S	S	M	M	S	M

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
Core – II		Course Code: 23UIT2C02		Course Title: Java Programming
Semester	Hours/Week	Total Hours	Credits	Total Marks
II	4	60	5	100

Course Objectives

1. To provide knowledge on fundamentals of object-oriented programming
2. To have the ability to use the SDK environment to create, debug and run servlet programs

UNIT – I

Fundamentals of Object- Oriented Programming: Introduction – Object Oriented Paradigm – Concepts of Object – Oriented Programming – Benefits of OOP – Evolution: Java History- Java Features - Differs from C and C++ - Overview of Java Language: Java Program- Structure – Tokens – Java Statements – Java Virtual Machine – Command Line Arguments

UNIT – II

Constants, Variables and Data Types – Operators and Expressions – Decision making and Branching – Looping – Arrays - Strings – Collection Interfaces and classes

UNIT – III

Classes objects and methods: Introduction – Defining a class – Method Declaration – Constructors - Method Overloading – Static Members – Nesting of methods – Inheritance – Overriding – Final variables and methods – Abstract methods and classes

UNIT – IV

Multiple Inheritance: Defining Interfaces – Extending Interfaces – Implementing Interfaces – Packages: Creating Packages – Accessing Packages – Using a Package – Managing Errors and Exceptions - Multithreaded Programming

UNIT – V

Layout Managers - JDBC – Java Servlet: - Servlet Environment Role – Servlet API – Servlet Life Cycle – Servlet Context – HTTP Support – HTML to Servlet Communication



Text Book

1. C Xavier, "Java Programming – A Practical Approach", Tata McGraw Hill Edition Private Ltd
2. E Balagurusamy(2010), "Programming with Java", Tata McGraw Hill Edition India Private Ltd, 4th Edition

Reference Books

1. P.Naughton and H.Schildt (1999), "Java 2 The Complete Reference", TMH, 3rd Edition
2. Jaison Hunder & William Crawford (2002), "Java Servlet Programming", O'Reilly
3. Jim Keogh (2002), "J2EE: The Complete Reference", Tata McGraw Hill Edition.

Web Reference:

1. <http://javabeginnerstutorial.com/core-java/>
2. <http://www.tutorialspoint.com/java/>
3. <http://beginnersbook.com/java-tutorial-for-beginners-with-examples/>
4. <http://www.homeandlearn.co.uk/java/java.html>
5. <http://www.journaldev.com/1877/servlet-tutorial-java> (Unit V : Servlet API)

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Outline the basic terminologies of OOP, programming language techniques, JDBC and Internet programming concepts	K1 & K2
CO2	Solve problems using basic constructs, mechanisms, techniques and technologies of Java	K2 , K3 & K5
CO3	Analyse and explain the behavior of simple programs involving different techniques such as Inheritance, Packages, Interfaces, Exception Handling and Thread and technologies such as JDBC and Servlets	K22,K3 & K4



CO4	Assess various problem-solving strategies involved in Java to develop a high-level application.	K3, K4 & K5
CO5	Design GUI based JDBC applications and able to develop Servlets using suitable OOP concepts and techniques	K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

CO/ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	S	M	M	M	M	M
CO2	M	S	M	M	M	M
CO3	M	S	S	S	M	M
CO4	M	S	M	M	M	M
CO5	S	S	M	M	M	M

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
Core Practical – II		Course Code: 23UIT2P02		Course Title: Java Programming & Data Structures Practical
Semester	Hours/Week	Total Hours	Credits	Total Marks
II	4	60	5	100

Course Objectives

1. To design and develop applications using different Java programming language techniques, JDBC & Servlets
2. To organize and manipulate the data with the help of fundamental data structures

List of Programs

1. Basic Programs
2. Arrays
3. Strings
4. ArrayList, HashSet and Vector collection classes
5. Classes and Objects
6. Interfaces
7. Inheritance
8. Packages
9. Exception Handling
10. Threads
11. Linked List
12. Stacks
13. Queue
14. Sorting
15. Binary Tree Representation
16. Working with Database using JDBC
17. Web application using Servlet



Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Identify and explain the way of solving the simple problems	K1 & K2
CO2	Use appropriate software development environment to write, compile and execute object-oriented Java programs	K2 , K3 , K5 & K6
CO3	Analyze and identify necessary mechanisms of Java needed to solve real-world problem	K2,K3, K4 & K5
CO4	Test for defects and validate a Java program with different inputs	K3, K4 & K5
CO5	Design, develop and compile Core Java , GUI , JDBC and servlet applications that utilize OOP and data structure concepts	K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

CO/ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	S	M	S	S	M	M
CO2	S	S	S	S	M	M
CO3	S	S	S	M	M	S
CO4	S	S	S	S	S	M
CO5	S	S	M	S	M	M

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
Core – III		Course Code: 23UIT3C03		Course Title: Relational Database Management System
Semester	Hours/Week	Total Hours	Credits	Total Marks
III	2	30	5	100

Course Objectives

1. To understand the basic DBMS models and architecture
2. To learn how to query and normalize the database.
3. To study the data base design, transaction Processing and Management and Security Issues.

UNIT – I

Introduction to Databases: Introduction – Characteristics of the Database Approach – Actors on the Scene – Workers behind the scene – Advantages of using DBMS Approach. Overview of database and Architectures: Data Models, Schemas, and Instances – Three-schema Architecture and Data Independence – Database languages & Interfaces – Database System Environment– Centralized & Client Server Architecture for DBMS - Classification of DBMS.

UNIT – II

Basic Relational Model: Relational Model Concepts – Relational Model Constraints and Relational Database Schemas – Update Operations, Tractions, Dealing with Constraint Violations – Formal Relational Languages: Unary Relational Operations: SELECT and PROJECT – Relational Algebra Operations from Set Theory – Binary Relational Operations: JOIN and DIVISION – Examples of Queries in Relational Algebra.

UNIT – III

Conceptual Data Modeling using the ER Model: Using High-Level Conceptual Data Models for Database Design – An example DB application – Entity Types, Entity Sets, Attributes, and Keys – Relationship Types, Relationship sets, Roles, and Structural Constraints – Weak entity types – Example- Mapping a Conceptual Design into Logical Design: Relational



Database Design using ER- Relational Mapping – Mapping EER Model Constructs to Relations

UNIT – IV

Functional Dependencies and Normalization for Relational Database: Functional Dependencies – Definition of Functional Dependency – Normal Forms based on Primary Keys – Normalization of Relations – First Normal Form – Second Normal Form – Third Normal Form – BCNF- Fourth Normal Form- Fifth Normal Form.

UNIT – V

SQL: The Relational Database Standard: Data definition, Constraints, and schema changes in SQL – Basic Queries in SQL – More complex SQL Queries – Insert, delete and update statements in SQL – Views in SQL.

PL/SQL: Introduction to PL/SQL – More on PL/SQL – Error Handling in PL/SQL – Oracle's Named Exception Handlers – Stored Procedures and Functions – Execution of Procedures and Functions – Advantages – Procedures Vs. Functions – Syntax for Creating Procedures and Functions – Deleting a Stored Procedure or Function – Oracle Packages – Database Triggers – Types Of Triggers – Deleting a Trigger – Raise-Application Error Procedure

Text Books

1. Ramez Elmasri, Shamkant B. Navathe (2014), —Database Systems, Sixth edition, Pearson Education, New Delhi.
2. Ivan Bayross (2003 Reprint), SQL, PL/SQL-The Programming Language of Oracle, Second Revised Edition, BPB Publications, New Delhi.

Reference Book:

1. Abraham Silberschatz, Henry F.Korth, S.Sudarshan, Database System Concepts, Tata McGraw Hill Publication, 4th Edition.

Reference Websites

1. <http://srikanthtechnologies.com/books/orabook/ch1.pdf>
2. http://www.tmv.edu.in/pdf/Distance_education/BCA%20Books/BCA%20IV%20SEM/BCA-428%20Oracle.pdf
3. <http://www.tutorialspoint.com/sql/sql-rdbms-concepts.htm>
4. <http://ecomputernotes.com/database-system/rdbms>
5. <http://www.mithunashok.com/2011/04/basics-of-rdbms.html>



Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Outline the fundamental RDBMS concepts and PL/SQL	K1 & K2
CO2	Apply database operations, mapping, normalization, SQL and PL/SQL	K2 & K5
CO3	Analyze the requirements to implement relational database concepts	K1, K2, K3 & K4
CO4	Evaluate the database based on various models and normalization.	K5 & K6
CO5	Design and construct normalized tables and manipulate it effectively using SQL and PL/SQL database objects	K4&K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	S	S
CO2	S	S	M	S	S
CO3	S	S	S	S	S
CO4	S	S	M	S	S
CO5	S	S	M	S	S

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
Core Practical – III		Course Code: 23UIT3C03		Course Title : RDBMS- PRACTICAL
Semester	Hours/Week	Total Hours	Credits	Total Marks
III	3	30	5	100

Course Objectives

1. The primary Objective of this paper is to learn and implement SQL & PL/SQL.

List of Programs:

SQL:

1. DDL Commands
2. DML Commands
3. DCL Commands
4. SQL Built-in functions
5. Using Sub Queries

PL/SQL:

6. Simple programs using PL/SQL
7. Procedures
8. User-defined functions
9. Exception Handling
10. Triggers



Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Choose appropriate SQL queries and PL/SQL blocks for the database.	K1,K2,K5 & K6
CO2	Implement SQL and PL/SQL blocks for the given problem effectively.	K2,K5 & K6
CO3	Analyse the problem and Exceptions using queries and PL/SQL blocks.	K3 & K4
CO4	Validate the database for normalization using SQL and PL/SQL blocks.	K5 & K6
CO5	Design Database tables, create Procedures, user-defined functions and Triggers.	K4,K5&K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	S	S
CO2	S	S	M	S	M
CO3	M	S	S	S	M
CO4	M	S	M	S	S
CO5	M	M	M	S	S

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
CORE – IV		Course Code: 23UIT4C04		Course Title: .Net Programming
Semester	Hours/Week	Total Hours	Credits	Total Marks
IV	2	30	5	100

Course Objectives

1. To provide sufficient knowledge in developing web applications using C# and ASP.NET
2. To manipulate data from SQL Server using Microsoft ADO.NET.

UNIT – I

The Creation of C#: C# Relates to the .Net Framework - Common Language Runtime - Managed vs unmanaged code - An Overview of C#: Object-Oriented Programming - First Simple Program-Handling Syntax errors - Using code blocks-semicolon, positioning and Indentation-The C# Keywords-Identifiers-The .Net Framework Class Library-Data Types, Literals and Variables- Operators.

UNIT – II

Program Control Statements: If Statement- switch Statement-For Loop- While loop do-while loop- foreach loop-using break to exit a loop-using continue- goto- Introducing Classes and objects: Class Fundamentals- objects creation-Methods-constructors-Garbage Collection and Destructors-Exception Handling.

UNIT – III

Arrays and Strings: Arrays-Multidimensional Arrays-Jagged Arrays- for each loop Strings- Methods and classes: Method overloading- Main Method-Recursion-static Classes Delegates, Events and Lambda Expressions: Delegates -Lambda Expressions-LINQ

UNIT – IV

Developing ASP.NET Applications: Visual Studio: Creating Websites- The Anatomy of a Web Form – Web Form Fundamentals: Converting HTML Page to an ASP.Net Page – Page Class – Web Controls. State Management: View State - Transferring Information between Pages – Cookies – Session State – Application State.

**UNIT – V**

Validation Controls – AdRotator Control. Working with Data: ADO.NET Fundamentals:– Direct Data Access – Disconnected Data Access - Data Binding: Data Binding with ADO.NET –Data Source Controls - The Data Controls: The GridView – Formatting the GridView – Selecting GridView Row – Editing, Sorting and Paging the GridView- Generating Crystal Reports.

Text Books

1. Herbert Schildt (2010), C# 4.0 The Complete Reference, Tata McGraw-Hill Pvt Ltd
2. Mathew MacDonald, (2010), Beginning ASP.NET 4 in C# 2010, Second Edition, Apress.

Reference Book:

1. Greg Buczek (2002), —ASP.NET – Developer’s guidel, Tata MaGraw Hill Publication
2. Jesse Liberty, (2002), —Programming C#, 3.0l, O’Reilly Press
3. J.Sharp (2009), —Microsoft Visual C# 2008 Step by Step, PHI Learning Private Ltd.
4. Christian Nagel et al. , —Professional C# 2005 with .NET 3.0l, Wiley India, 2007

Reference Websites

1. <http://ssw.jku.at/Teaching/Lectures/CSharp/Tutorial/>
2. <http://www.csharpkey.com/csharp/>
3. <http://www.w3schools.com/aspnet/default.asp>

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Outline the features of C# programming language and ASP.NET applications	K1 & K2
CO2	Demonstrate the salient properties of C# and ASP.NET applications	K1,K2 & K5
CO3	Identify the various stages in developing a web forms	K2, K3 K4 & K6
CO4	Select the appropriate controls to create a web form.	K4,K5 & K6
CO5	Recommend a data driven web application by connecting to the data sources	K3,K4 & K5

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create



Mapping of COs with POs

PO CO	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	S	S
CO2	S	S	M	S	S
CO3	S	S	S	S	S
CO4	S	S	M	S	S
CO5	S	S	M	S	S

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
CORE PRACTICAL – IV		Course Code: 23UIT4P04		Course Title: .Net Programming lab
Semester	Hours/Week	Total Hours	Credits	Total Marks
IV	3	30	5	100

Course Objectives

1. To provide sufficient knowledge in developing web applications using C# and ASP.NET
2. To manipulate data from SQL Server using Microsoft ADO.NET.

Lis of Programs:

1. C# Basics
2. Looping Constructs
3. Arrays & Jagged Array
4. Strings
5. Classes and Objects
6. Method overloading
7. Delegates
8. LINQ
9. Lambda Expressions



Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Demonstrate MS Visual Studio.NET IDE to Create applications.	K3,K5 & K6
CO2	Apply C# and ASP.NET concepts to design applications.	K3,K4 & K6
CO3	Simplify the functionality of the web application in accordance to the user Requirement.	K2, K3 K4 & K6
CO4	Evaluate the web application to fix the errors.	K4,K5
CO5	Build a web application using C# and ASP.NET concepts to solve the problem	K3,K4,K5 &K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO CO	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	S	S
CO2	S	S	M	S	S
CO3	S	S	S	S	S
CO4	S	S	M	S	S
CO5	S	S	M	S	S

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
Core – V		Course Code: 23UIT5C05		Course Title: Operating System
Semester	Hours/Week	Total Hours	Credits	Total Marks
V	5	30	4	100

Course Objectives

1. The objective of this course is to provide an introduction to the internal operation of modern operating systems
2. To focus on the core concepts such as processes and threads, mutual exclusion, CPU scheduling, deadlock, memory management, and file systems..

UNIT – I

Introduction: Definition of Operating System - OS Structures: OS Services - System Calls - Virtual Machines - Process Management: Process Concept - Process Scheduling - Operation on Processes - Co-operating Processes - Inter-process Communication.

UNIT – II

CPU Scheduling: Basic Concepts - Scheduling Criteria - Scheduling Algorithms - Process Synchronization: The Critical Section Problem - Semaphores - Classical Problems of Synchronization - Critical Regions.

UNIT – III

Deadlocks: System Model - Deadlock characterization – Methods for Handling Deadlocks
Deadlock Prevention - Deadlock avoidance- Deadlock Detection - Recovery from Deadlock.

UNIT – IV

Storage management: Memory management - Swapping – Contiguous Memory allocation. Paging – Segmentation – Segmentation with Paging – Virtual memory: Demand paging - Page replacement – Thrashing. Mass-Storage Structure: Disk Structure- Disk scheduling.

UNIT – V

File-System Interface: File Concept-File Attributes-File Operations – Access Methods: Sequential Access – Direct Access – Directory Structure: Single-Level Directory- Two –Level Directory-Tree-Structured Directories- Introducing Shell Programming – Linux General Purpose Commands-Process Oriented Commands – Communication Oriented Commands.



Text Books

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2012), —Operating System Concepts, 9th edition, Wiley Student Edition.
2. B.Mohamed Ibrahim, (2005), —Linux Practical Approach, Firewall Media

Reference Book:

1. Milan Milenkovic (2003), —Operating System Concepts and Design, McGraw Hill.
2. Andrew S. Tanenbaum, (2001), —Modern Operating Systems, 2nd Edition, Prentice Hall of India.
3. Deital and Deital (1990), —Introduction to Operating System, Pearson Education.
4. William Stallings (1997), —Operating Systems, Prentice Hall of India..

Reference Websites

1. http://www.tutorialspoint.com/operating_system/
2. <http://www.reallylinux.com/docs/files.shtml>
3. http://www.tutorialspoint.com/operating_system/os_linux.htm

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the concepts, importance, application and the process of developing multimedia	K1 & K2
CO2	To have basic knowledge and understanding about image related processings	K1,K2 & K5
CO3	To understand the framework of frames and bit images to animations	K2, K3 & K4
CO4	Speaks about the multimedia projects and stages of requirement in phases of project.	K4,K5 & K6
CO5	Understanding the concept of cost involved in multimedia planning, designing, and producing	K2,K3,K4 &K5

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create



Mapping of COs with POs

PO CO	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	S	S
CO2	S	S	M	S	S
CO3	S	S	S	S	S
CO4	S	S	M	S	S
CO5	S	S	M	S	S

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
Core – VI		Course Code: 23UIT5C06		Course Title: Python Programming
Semester	Hours/Week	Total Hours	Credits	Total Marks
V	5	30	4	100

Course Objectives

1. Understand the concepts of Python programming.
2. To apply the OOPs concept in PYTHON programming.
3. To impart knowledge on demand and supply concepts
4. Learn to solve basic programming problems.

UNIT – I

Basics of Python Programming: History of Python-Features of Python-Literal-Constants-Variables - Identifiers–Keywords-Built-in Data Types-Output Statements – Input Statements-Comments – Indentation- Operators-Expressions-Type conversions. Python Arrays: Defining and Processing Arrays – Array methods.

UNIT – II

Control Statements: Selection/Conditional Branching statements: if, if-else, nested if and if-elif-else statements. Iterative Statements: while loop, for loop, else suite in loop and nested loops. Jump Statements: break, continue and pass statements.

UNIT – III

Functions: Function Definition – Function Call – Variable Scope and its Lifetime-Return Statement. Function Arguments: Required Arguments, Keyword Arguments, Default Arguments and Variable Length Arguments- Recursion. Python Strings: String operations-Immutable Strings - Built-in String Methods and Functions - String Comparison. Modules: import statement- The Python module – dir() function – Modules and Namespace – Defining our own modules..

UNIT – IV

Lists: Creating a list -Access values in List-Updating values in Lists-Nested lists -Basic list operations-List Methods. Tuples: Creating, Accessing, Updating and Deleting Elements in a



tuple – Nested tuples– Difference between lists and tuples. Dictionaries: Creating, Accessing, Updating and Deleting Elements in a Dictionary – Dictionary Functions and Methods - Difference between Lists and Dictionaries.

UNIT – V

Python File Handling: Types of files in Python - Opening and Closing files-Reading and Writing files: write() and writelines() methods- append() method – read() and readlines() methods – with keyword – Splitting words – File methods - File Positions- Renaming and deleting files.

Text Books

1. Reema Thareja, “Python Programming using problem solving approach”, First Edition, 2017, Oxford University Press.
2. Dr. R. Nageswara Rao, “Core Python Programming”, First Edition, 2017, Dream tech Publishers

Reference Book:

1. VamsiKurama, “Python Programming: A Modern Approach”, Pearson Education.
2. Mark Lutz, ”Learning Python”, Orielly.

Reference Websites

1. <https://www.programiz.com/python-programming>
2. <https://www.guru99.com/python-tutorials.html>



Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Outline the basic concepts in python language.	K1 & K2
CO2	Interpret different looping and conditional statements in python language	K1,K2 & K5
CO3	Apply the various data types and identify the usage of control statements, loops, functions and Modules in python for processing the data	K2, K3 & K4
CO4	Analyze and solve problems using basic constructs and techniques of python.	K4,K5 & K6
CO5	Assess the approaches used in the development of interactive application.	K2,K3,K4,K5 &K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	S	M
CO2	M	S	M	S	M
CO3	M	S	M	M	S
CO4	L	M	M	L	S
CO5	M	M	M	L	S

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
Core Practical – V		Course Code: 23UIT5P05		Course Title : Python Programming-Lab
Semester	Hours/Week	Total Hours	Credits	Total Marks
V	3	30	4	100

Course Objectives

1. Understand the fundamentals of programming using Python, such as variables, data types, control structures, and functions.
2. Learn how to use Python libraries and modules to solve problems.
3. Practice writing Python code to solve real-world problems and build basic applications.
4. Gain experience with common programming paradigms, such as object-oriented programming and functional programming.
5. Understand best practices for debugging and testing code..

List of Programs:

1. Program using variables, constants, I/O statements in Python.
2. Program using Operators in Python.
3. Program using Conditional Statements.
4. Program using Loops.
5. Program using Jump Statements.
6. Program using Functions.
7. Program using Recursion.
8. Program using Arrays.
9. Program using Strings.
10. Program using Modules.
11. Program using Lists.
12. Program using Tuples.
13. Program using Dictionaries.
14. Program for File Handling.



Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the significance of control statements, loops and functions in creating Simple programs.	K1,K2,K5 & K6
CO2	Interpret the core data structures available in python to store, process and sort the data.	K2,K5 & K6
CO3	Develop the real time applications using python programming language.	K4 & K6
CO4	Analyze the real time problem using suitable python concepts.	K3,K4 & K6
CO5	Assess the complex problems using appropriate concepts in python.	K4,K5&K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	S	S	S	S	S
CO3	S	S	M	S	S
CO4	S	M	S	S	M
CO5	S	S	S	S	S

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
Core – VIII		Course Code: 23UIT6C08		Course Title Data Communication And Networking
Semester	Hours/Week	Total Hours	Credits	Total Marks
VI	5	30	4	100

Course Objectives

1. This course is to provide students with an overview of the concepts and fundamentals of data communication and computer networks
2. To familiarize the student with the basic taxonomy and terminology of the computer.

UNIT – I

Introduction: Data Communication-Networks: Distributed Processing-Network Criteria Physical Structures –Network Models-Categories of Network-Internetwork - The Internet Protocols and Standards – Network Models: Layers in the OSI Model - TCP/IP Protocol Suite.

UNIT – II

Data and Signals: Analog and Digital Data - Analog and Digital Signals – Performance - Digital Transmission: Transmission Modes – Multiplexing: FDM – WDM - Synchronous TDM -Statistical TDM - Transmission Media: Guided media - Unguided Media.

UNIT – III

Switching: Circuit Switched Networks - Datagram Networks-Virtual Circuit Network - Error Detection and Correction: Introduction - Block Coding - Linear Block Codes - Cyclic Codes: Cyclic Redundancy Check - Checksum. Data Link Control: Framing - Flow Control and Error Control - Noiseless Channel: Stop-and-wait Protocol.

UNIT – IV

Wired LANs: Standard Ethernet-GIGABIT Ethernet-Wireless LAN: Bluetooth Connecting LANs: Connecting Devices: Passive Hubs-Repeaters-Active Hubs-Bridges-Two Layer Switches-Routers-Three layer Switches-Gateway-Network Layer: Internet Protocol: IPv4 – Ipv6-Transition from IPv4 to IPv6..

**UNIT – V**

Network Layer: Delivery, Forwarding and Routing- Unicast Routing Protocols: Distance Vector Routing-Link state routing- Future & Current Trends in Computer Networks: 5G Network: Salient Features-Technology-Applications-Advanced Features-Advantages & Disadvantages-Internet of Things: key Features -Advantages & Disadvantages-IOT Hardware- IOT Technology and Protocols-IOT Common Uses-Applications-WiFi-WiMax Lifi- Lifi vs Wifi..

Text Books

1. Behrouz and Forouzan,(2006), Data Communication and Networking, 4th Edition, TMH.
2. Ajit Pal,(2014), Data Communication and Computer Networks, PHI.

Reference Book:

1. Jean Walrand (1998), —Communication Networks,Second Edition, TataMcGraw Hill.

Reference Websites

1. http://www.tutorialspoint.com/data_communication_computer_network/
2. http://www.slideshare.net/zafar_ayub/data-communication-and-network-11903853
3. <http://www.freetechbooks.com/data-communication-and-networks-f31.html>



Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the fundamental concepts of computer networks and its application areas	K1 & K2
CO2	Identify and use various networking techniques and components to establish networking connection and transmission	K1,K2 & K5
CO3	Analyze the services performed by different network layers and recent advancements in networking	K2, K3 & K4
CO4	Compare various networking models, layers, protocols and technologies.	K4 &K5
CO5	Select the appropriate networking mechanisms to build a reliable network	K2,K3,K4,K5 &K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO CO	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	S	S
CO2	S	S	M	S	S
CO3	S	S	S	S	S
CO4	S	S	M	S	S
CO5	S	S	M	S	S

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology

Core – IX		Course Code: 23UIT6C09		Course Title Data Mining	
Semester	Hours/Week	Total Hours	Credits	Total Marks	
VI	5	30	4	100	

Course Objectives

1. The objective of this course is to provide an introduction to the internal operation of modern operating systems.
2. To focus on the core concepts such as processes and threads, mutual exclusion, CPU scheduling, deadlock, memory management, and file systems..

UNIT – I

Introduction: Data Mining – Kinds of Data and Patterns to be Mined – Technologies used – Kinds of Applications are Targeted - Major Issues –Data objects and Attribute types – Basic statistical Descriptions of Data- **Data Preprocessing** : Data Cleaning – Data Integration - Data Reduction - Data Transformation.

UNIT – II

Association Rules Mining: Introduction – Frequent Itemset Mining Methods: Apriori Algorithm-Generating Association Rules from Frequent Itemsets-Improving the efficiency of Apriori-A Pattern –Growth Approach for mining Frequent Itemsets-Pattern Evaluation Methods..

UNIT – III

Classification: Introduction –Basic concepts – Logistic regression - Decision tree induction– Bayesian classification, Rule–based classification-Model Evaluation and selection.

UNIT – IV

Cluster Analysis: Introduction-Requirements for Cluster Analysis - **Partitioning Methods:** The K-Means method - **Hierarchical Method:** Agglomerative method - **Density based methods:** DBSCAN-**Evaluation of Clustering:** Determining the Number of Clusters – Measuring Clustering Quality

**UNIT – V**

Outlier Detection: Outliers and Outlier Analysis – Outlier Detection Methods - **Data Visualization:** Pixel-oriented visualization – Geometric Projection visualization technique- Icon-based-Hierarchical visualization-Visualizing complex data and relations

Text Books

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2012), —Operating System Concepts, 9th edition, Wiley Student Edition.
2. B.Mohamed Ibrahim, (2005), —Linux Practical Approach, Firewall Media.

Reference Book:

1. Milan Milenkovic (2003), —Operating System Concepts and Design, McGraw Hill.
2. Andrew S. Tanenbaum, (2001), —Modern Operating Systems, 2nd Edition, Prentice Hall of India.
3. Deital and Deital (1990), —Introduction to Operating System, Pearson Education.
4. William Stallings (1997), —Operating Systems, Prentice Hall of India.

Reference Websites

1. http://www.tutorialspoint.com/operating_system/
2. <http://www.reallylinux.com/docs/files.shtml>
3. http://www.tutorialspoint.com/operating_system/os_linux.htm



Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Outline the fundamentals and the principles of Data Mining	K1 & K2
CO2	Apply suitable different preprocessing for data mining	K1,K2 & K5
CO3	Classify data-mining techniques based on the different applications	K2, K3 & K4
CO4	Analyze the various data mining algorithms with respect to functionality	K3, K4 &K5
CO5	Recommend appropriate data models for data mining techniques to solve real world problems	K2,K3,K4 & K5

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	S
CO2	S	S	M	S	S
CO3	M	S	S	M	S
CO4	S	S	M	M	S
CO5	S	S	M	M	S

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
Core Practical – VI		Course Code: 23UIT6P06		Course Title : Data Mining Lab
Semester	Hours/Week	Total Hours	Credits	Total Marks
V	3	30	4	100

Course Objectives

1. Understand the data sets, data preprocessing and demonstrate the working of algorithms for data mining tasks such as association rule mining, classification, clustering and regression

List of Programs:

1. Understanding the data
2. Visualization Techniques
3. Data Preprocessing
4. Handling Missing Values
5. Data Reduction-Principal Component Analysis
6. Data Normalization-Min-Max, Z-score, Decimal Scaling
7. Association Rule Mining-Apriori Algorithm
8. Classification
9. Logistic Regression
10. Decision Tree
11. Naive Bayesian
12. Clustering
13. K-Means Clustering
14. DBSCAN
15. Agglomerative
16. Case Study



Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the real time datasets for analysis	K1,K2,K5 & K6
CO2	Apply suitable preprocessing for data mining task	K2,K3,K5 & K6
CO3	Demonstrate data-mining techniques based on the different applications	K4 & K5
CO4	Analyze the performance evaluation of various data mining algorithms	K3,K4,K5 & K6
CO5	Prescribe appropriate data models for data mining techniques to solve real world problems	K4,K5&K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	S
CO2	S	S	M	S	S
CO3	M	S	S	M	S
CO4	S	S	M	M	S
CO5	S	S	M	M	S

S – Strong

M – Medium

L – Low



Elective Courses



Programme: B.Sc., Information Technology				
Elective – IV		Course Code: 23UIT5E01		Course Title: Software Metrics
Semester	Hours/Week	Total Hours	Credits	Total Marks
V	5	75	3	100

Course Objectives

1. Gain a solid understanding of what software metrics are and their significance
2. Learn how to identify and select appropriate software metrics based on project goals
3. Acquire knowledge and skills in collecting and measuring software metrics
4. Learn how to analyze and interpret software metrics data to extract valuable insights
5. Gain the ability to evaluate software quality using appropriate metrics.

UNIT – I

Fundamentals of Measurement: Need for Measurement: Measurement in Software Engineering, Scope of Software Metrics, The Basics of measurement: There presentational theory of measurement, Measurement and models, Measurement scales and scale types, meaningfulness in measurement.

UNIT – II

A Goal-Based Framework for Software Measurement: Classifying software measures, determining what to Measure, Applying the framework, Software measurement validation, Performing Software Measurement Validation

Empirical investigation: Principles of Empirical Studies, Planning Experiments, Planning case studies as quasi-experiments, Relevant and Meaningful Studies.

UNIT – III

Software Metrics Data Collection: Defining good data, Data collection for incident reports, How to collect data, Reliability of data collection Procedures. Analyzing software measurement data: Statistical distributions and hypothesis testing, Classical data analysis techniques, Examples of simple analysis techniques.



UNIT – IV

Measuring internal product attributes: Size Properties of Software Size, Code size, Design size, Requirements analysis and Specification size, Functional size measures and estimators, Applications of size measures. Measuring internal product attributes: Structure: Aspects of Structural Measures, Control flow structure of program units, Design-level Attributes, Object-oriented Structural attributes and measures.

UNIT – V

Measuring External Product Attributes: Modelling software quality, Measuring aspects of quality, Usability Measures, Maintain ability measures, Security Measures
Software Reliability: Measurement and Prediction: Basics of reliability theory, The software reliability problem, Parametric reliability growth models, Predictive accuracy.

Text Books

1. Software Metrics A Rigorous and Practical Approach, Norman Fenton, James Bieman, Third Edition, 2014.

Reference Books

1. Software metrics, Norman E, Fenton and Shari Lawrence Pfleeger, International Thomson Computer Press, 1997
2. Metric and models in software quality engineering, Stephen H. Kan, Second edition, 2002, Addison Wesley Professional
3. Practical Software Metrics for Project Management and Process Improvement, Robert B. Grady, 1992, Prentice Hall.

Web Reference

1. <https://lansa.com/blog/general/what-are-software-metrics-how-can-i-measure-these-metrics/>
2. <https://stackify.com/track-software-metrics/>



Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement
CO1	Understand various fundamentals of measurement and software metrics
CO2	Identify framework and analysis techniques for software measurement
CO3	Apply internal and external attributes of software product for effort estimation
CO4	Use appropriate analytical techniques to interpret software metrics data and derive meaningful insights
CO5	Recommend reliability models for predicting software quality

Mapping of COs with POs

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	M
COM	M	S	S	S	S
CO3	M	M	S	S	S
CO4	S	M	M	S	M
CO5	S	S	S	M	S

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
Elective – IV		Course Code: 23UIT5E02		Course Title: Grid Computing
Semester	Hours/Week	Total Hours	Credits	Total Marks
V	5	90	3	100

Course Objectives

1. To learn the basic construction and application of Grid computing.
2. To learn grid computing organization and their Role.
3. To learn Grid Computing Anatomy.
4. To learn Grid Computing road map.
5. To learn various type of Grid Architecture.

UNIT – I

Introduction: Early Grid Activity, Current Grid Activity, Overview of Grid Business areas, Grid Applications, Grid Infrastructures

UNIT – II

Grid Computing organization and their Roles: Organizations Developing Grid Standards, and Best Practice Guidelines, Global Grid Forum (GCF), #Organization Developing Grid Computing Toolkits and Framework#, Organization and building and using grid based solutions to solve computing, commercial organization building and Grid Based solutions.

UNIT – III

Grid Computing Anatomy: The Grid Problem, The conceptual of virtual organizations, # Grid Architecture # and relationship to other distributed technology.

UNIT – IV

The Grid Computing Road Map: Autonomic computing, Business on demand and infrastructure virtualization, Service-Oriented Architecture and Grid, #Semantic Grids#.

UNIT – V

Merging the Grid services Architecture with the Web Services Architecture: Service-Oriented Architecture, Web Service Architecture, #XML messages and Enveloping#, Service message description Mechanisms, Relationship between Web Services and Grid Services, Web services Interoperability and the role of the WS-I Organization.



Text Books

1. Joshy Joseph and Craig Fellenstein, Grid computing, Pearson / IBM Press, PTR, 2004.

Reference Books

1. Ahmer Abbas and Graig computing, A Practical Guide to technology and applications, Charles River Media, 2003.

Web Resources

1. https://en.wikipedia.org/wiki/Grid_computing
2. https://link.springer.com/chapter/10.1007/978-1-84882-409-6_4
3. <https://www.redbooks.ibm.com/redbooks/pdfs/sg246778.pdf>

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To understand the basic elements and concepts of Grid computing.	K1,K2 & K4
CO2	To understand the Grid computing toolkits and Framework.	K1, K2 & K3
CO3	To understand the concepts of Anatomy of Grid Computing.	K2,K3 & K4
CO4	To understand the concept of service oriented architecture.	K3, K4 & K5
CO5	To Gain knowledge on grid and web service architecture.	K3,K4,K5 & K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create



Mapping of COs with POs

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	S				
CO2	S	S			
CO3				S	
CO4				S	S
CO5			S		

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
Elective – IV		Course Code: 23UIT5E03		Course Title: Fuzzy Logic
Semester	Hours/Week	Total Hours	Credits	Total Marks
V	5	90	3	100

Course Objectives

1. To understand the basic concept of Fuzzy logic
2. To learn the various operations on relation properties
3. To study about the membership functions
4. To learn about the Defuzzification and Fuzzy Rule-Based System
5. To learn the concepts of Applications of Fuzzy Logic

UNIT – I

Introduction to Fuzzy Logic- Fuzzy Sets- Fuzzy Set Operations, Properties of Fuzzy Sets, Classical and Fuzzy Relations: Introduction-Cartesian Product of Relation-Classical Relations-Cardinality of Crisp Relation..

UNIT – II

Operations on Crisp Relation-Properties of Crisp Relations-Composition Fuzzy Relations, Cardinality of Fuzzy Relations-Operations on Fuzzy Relations-Properties of Fuzzy Relations- Fuzzy Cartesian Product and Composition-Tolerance and Equivalence Relations ,Crisp Relation

UNIT – III

Membership Functions: Introduction, Features of Membership Function, Classification of Fuzzy Sets, Fuzzification, Membership Value Assignments, Intuition, Inference, Rank Ordering.

UNIT – IV

Defuzzification: Introduction, Lambda Cuts for Fuzzy Sets, Lambda Cuts for Fuzzy Relations, Defuzzification Methods, Fuzzy Rule-Based System: Introduction, Formation of Rules, Decomposition of Rules, Aggregation of Fuzzy Rules, Properties of Set of Rules.

**UNIT – V**

I Applications of Fuzzy Logic: Fuzzy Logic in Automotive Applications, Fuzzy Antilock Brake System-Antilock-Braking System and Vehicle Speed-Estimation Using Fuzzy Logic

Text Books

1. S. N. Sivanandam, S. Sumathi and S. N. Deepa-Introduction to Fuzzy Logic using MATLAB, Springer-Verlag Berlin Heidelberg 2007..

Reference Books

2. Guanrong Chen and Trung Tat Pham- Introduction to Fuzzy Sets, Fuzzy Logic and Fuzzy Control Systems
3. Timothy J Ross , Fuzzy Logic with Engineering Applications

Web Resources

4. <https://www.javatpoint.com/fuzzy-logic>
5. <https://www.guru99.com/what-is-fuzzy-logic.html>

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the basics of Fuzzy sets, operation and properties.	K1,K2 & K4
CO2	Apply Cartesian product and composition on Fuzzy relations and use the tolerance and Equivalence relations.	K1, K2 & K3
CO3	Analyze various fuzzification methods and features of membership Functions.	K2,K3 & K4
CO4	Evaluate defuzzification methods for real time applications.	K3, K4 & K5
CO5	Design an application using Fuzzy logic and its Relations.	K3,K4,K5 & K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create



Mapping of COs with POs

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	S				
CO2	M	S			
CO3				S	
CO4				S	S
CO5			S		

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
Elective – V		Course Code: 23UIT5E04		Course Title: Natural Language Processing
Semester	Hours/Week	Total Hours	Credits	Total Marks
V	5	90	3	100

Course Objectives

1. To understand approaches to syntax and semantics in NLP.
2. To learn natural language processing and to learn how to apply basic algorithms in this field.
3. To understand approaches to discourse, generation, dialogue and summarization with in NLP.
4. To get acquainted with the algorithmic description of the main language levels: morphology, syntax, semantics, pragmatics, etc.
5. To understand current methods for statistical approaches to machine translation..

UNIT – I

Introduction: Natural Language Processing tasks in syntax, semantics, and pragmatics – Issue - Applications – The role of machine learning –Probability Basics –Information theory – Collocations - N-gram Language Models – Estimating parameters and smoothing – Evaluating language models.

UNIT – II

Word level and Syntactic Analysis: Word Level Analysis: Regular Expressions - Finite-State Automata - Morphological Parsing - Spelling Error Detection and correction – Words and Word classes - Part-of Speech Tagging. Syntactic Analysis: Context – free Grammar – Constituency – Parsing – Probabilistic Parsing.

**UNIT – III**

Semantic analysis and Discourse Processing: Semantic Analysis: Meaning Representation – Lexical Semantics – Ambiguity – Word Sense Disambiguation. Discourse Processing: cohesion - Reference Resolution – Discourse Coherence and Structure.

UNIT – IV

Natural Language Generation: Architecture of NLG Systems - Generation Tasks and Representations - Application of NLG. Machine Translation: Problems in Machine Translation. Characteristics of Indian Languages – Machine Translation Approaches – Translation involving Indian Languages.

UNIT – V

Information retrieval and lexical resources: Information Retrieval: Design features of Information Retrieval Systems - Classical, Non-classical, Alternative Models of Information Retrieval – valuation Lexical Resources: World Net – Frame Net Stemmers – POS Tagger – Research Corpora SSAS.

Text Book

1. Daniel Jurafsky, James H.Martin, Speech & language processing ,Pearson publications.
2. Allen, James. Natural language understanding. Pearson,1995.

Reference Books

1. Pierre M. Nugues, An Introduction to Language Processing with Perl and Prolog, Springer.

Web Reference

1. https://en.wikipedia.org/wiki/Natural_language_processing
2. <https://www.techtarget.com/searchenterpriseai/definition/natural-language-processing-NLP>



Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Programme Outcomes
CO1	Describe the fundamental concepts and techniques of natural language processing. Explain the advantages and disadvantages of different NLP technologies and their applicability in different business situations.	PO1, PO2, PO3, PO4, PO5, PO6
CO2	Distinguish among the various techniques, taking into account the assumptions, strengths, and weaknesses of each Use NLP technologies to explore and gain a broad understanding of text data.	PO1, PO2, PO3, PO4, PO5, PO6
CO3	Use appropriate descriptions, visualizations, and statistics to communicate the problems and their solutions. Use NLP methods to analyze sentiment of a text document.	PO1, PO2, PO3, PO4, PO5, PO6
CO4	Analyze large volume text data generated from a range of real-world applications. Use NLP methods to perform topic modelling.	PO1, PO2, PO3, PO4, PO5, PO6
CO5	Develop robotic process automation to manage business processes and to increase and monitor their efficiency and effectiveness. Determine the framework in which artificial intelligence and the Internet of things may function, including interactions with people, enterprise functions, and environments.	PO1, PO2, PO3, PO4, PO5, PO6



Mapping of COs with POs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO 1	S	S	S	S	S	S
CO 2	M	S	S	S	M	S
CO 3	S	S	S	S	S	S
CO 4	S	M	S	S	M	S
CO 5	S	S	S	S	S	S



Programme: B.Sc., Information Technology				
Elective – V		Course Code: 23UIT5E05		Course Title: Artificial Neural Networks
Semester	Hours/Week	Total Hours	Credits	Total Marks
V	5	90	3	100

Course Objectives

1. Understand the basics of artificial neural networks, learning process, single layer and multi-layer perceptron networks.
2. Understand the Error Correction and various learning algorithms and tasks.
3. Identify the various Single Layer Perception Learning Algorithm.
4. Identify the various Multi-Layer Perception Network.
5. Analyze the Deep Learning of various Neural network and its Applications..

UNIT – I

Artificial Neural Model – Activation functions – Feed forward and Feedback, Convex Sets, Convex Hull and Linear Separability, Non-Linear Separable Problem - Multilayer Networks. Learning Algorithms - Error correction- Gradient Descent Rules, Perception Learning Algorithm, Perception Convergence Theorem.

UNIT – II

Introduction, Error correction learning, Memory-based learning, Hebbian learning, Competitive learning, Boltzmann learning, credit assignment problem, Learning with and without teacher, learning tasks, Memory and Adaptation.

UNIT – III

Single layer Perception: Introduction, Pattern Recognition, Linear classifier, Simple perception, Perception learning algorithm, Modified Perception learning algorithm, Adaptive linear combiner, Continuous perception, Learning in continuous perception. Limitation of Perception.

**UNIT – IV**

Multi - Layer Perception Networks: Introduction, MLP with 2 hidden layers, Simple layer of a MLP, Delta learning rule of the output layer, Multilayer feed forward neural network with continuous perceptions, Generalized delta learning rule, Back propagation algorithm.

UNIT – V

Deep learning- Introduction- Neuro architectures building blocks for the DL techniques, Deep Learning and Neocognitron, Deep Convolutional Neural Networks, Recurrent Neural Networks (RNN), feature extraction, Deep Belief Networks, Restricted Boltzman Machines, Training of DNN and Applications.

Text Books

1. Neural Networks A Classroom Approach - SatishKumar, McGraw Hill – Second Edition.
2. Neural Network – A Comprehensive Foundation – Simon Haykins, Pearson Prentice Hall, 2nd Edition, 1999.

Reference Books

1. Artificial Neural Networks - B. Yegnanarayana, PHI, New Delhi, 1998.

Web Reference

1. https://www.w3schools.com/ai/ai_neural_networks.asp
2. https://en.wikipedia.org/wiki/Artificial_neural_network
3. https://link.springer.com/chapter/10.1007/978-3-642-21004-4_12



Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Programme Outcomes
CO1	Students will learn the basics of artificial neural networks with single layer and multi-layer perception networks.	PO1
CO2	Learn about the Error Correction and various learning algorithms and tasks.	PO1, PO2
CO3	Learn the various Perception Learning Algorithm.	PO4, PO6
CO4	Learn about the various Multi-Layer Perception Network.	PO4, PO5, PO6
CO5	Understand the Deep Learning of various Neural network and its Applications.	PO3, PO8

Mapping of COs with POs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	S							
CO 2	S	S						
CO 3				S		S		
CO 4				S	S	S		
CO 5			S					S

S-Strong M-Medium L-Low



Programme: B.Sc., Information Technology

Elective – V		Course Code: 23UIT5E06		Course Title: Cryptography
Semester	Hours/Week	Total Hours	Credits	Total Marks
V	5	90	3	100

Course Objectives

1. To understand the fundamentals of Cryptography
- M. To acquire knowledge on standard algorithms used to provide confidentiality, integrity and authenticity.
3. To understand the various key distribution and management schemes.
4. To understand how to deploy encryption techniques to secure data in transit across data networks
5. To design security applications in the field of Information technology

UNIT – I

Introduction: The OSI security Architecture – Security Attacks – Security Mechanisms – Security Services – A model for network Security.

UNIT – II

Classical Encryption Techniques: Symmetric cipher model – Substitution Techniques: Caesar Cipher – Monoalphabetic cipher – Play fair cipher – Poly Alphabetic Cipher – Transposition techniques – Stenography

UNIT – III

Block Cipher and DES: Block Cipher Principles – DES – The Strength of DES –RSA: The RSA algorithm.

UNIT – IV

Network Security Practices: IP Security overview - IP Security architecture – Authentication Header. Web Security: SecureSocket Layer and Transport Layer Security – Secure Electronic Transaction.

UNIT – V

Intruders – Malicious software – Firewalls t.



Text Books

1. William Stallings, “Cryptography and Network Security Principles and Practices”..

Reference Books

1. Behrouz A. Foruzan, “Cryptography and Network Security”, Tata McGraw-Hill, M007.
2. Atul Kahate, “Cryptography and Network Security”, Second Edition, M003, TMH.
3. M.V. Arun Kumar, “Network Security”, M011, First Edition, USP.

Web Resources

- 1 <https://www.tutorialspoint.com/cryptography/>
- M <https://gpgtools.tenderapp.com/kb/how-to/introduction-to-cryptography>

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Analyze the vulnerabilities in any computing system and hence be able to design a security solution.	K1 & K4
COM	Apply the different cryptographic operations of symmetric cryptographic algorithms	K1, KM & K3
CO3	Apply the different cryptographic operations of public key cryptography	KM, K3 & K4
CO4	Apply the various Authentication schemes to simulate different applications.	K3, K4 & K5
CO5	Understand various Security practices and System security standards	KM, K3, K5 & K6

K1 – Remember, KM – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create



Mapping of COs with POs

PO CO	PO1	POM	PO3	PO4	PO5
CO1	S	S	S	M	S
CO2	S	M	S	M	S
CO3	S	S	S	M	S
CO4	M	S	S	S	M
CO5	S	M	S	S	S

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
Elective – VII		Course Code: 23UIT6E07		Course Title: IoT and its Applications
Semester VI	Hours/Week 5	Total Hours 75	Credits 3	Total Marks 100

Course Objectives

1. Use of Devices, Gateways and Data Management in IoT.
2. Design IoT applications in different domain and be able to analyze their performance
3. Implement basic IoT applications on embedded platform
4. To gain knowledge on Industry Internet of Things
5. To Learn about the privacy and Security issues in IoT.

UNIT – I

IoT & Web Technology, The Internet of Things Today, Time for Convergence, Towards the IoT Universe, Internet of Things Vision, IoT Strategic Research and Innovation Directions, IoT Applications, Future Internet Technologies, Infrastructure, Networks and Communication, Processes, Data Management, Security, Privacy & Trust, Device Level Energy Issues, IoT Related Standardization, Recommendations on Research Topics.

UNIT – II

M2M to IoT – A Basic Perspective – Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The international driven global value chain and global information mono polies. M2M to IoT – An Architectural Overview – Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations.



UNIT – III

IoT Architecture -State of the Art – Introduction, State of the art, Architecture. Reference Model- Introduction, Reference Model and architecture, IoT reference Model, IoT Reference Architecture - Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views.

UNIT – IV

IoT Applications for Value Creations Introduction, IoT applications for industry: Future Factory Concepts, Brown field IoT, Smart Objects, Smart Applications, Four Aspects in your Business to Master IoT, Value Creation from Big Data and Serialization, IoT for Retailing Industry, IoT for Oil and Gas Industry, Opinions on IoT Application and Value for Industry, Home Management.

UNIT – V

Internet of Things Privacy, Security and Governance Introduction, Overview of Governance, Privacy and Security Issues, Contribution from FP7 Projects, Security, Privacy and Trust in IoT – Data - Platforms for Smart Cities, First Steps Towards a Secure Platform, Smartie Approach. Data Aggregation for the IoT in Smart Cities, Security.

Text Books

1. Vijay Madiseti and Arshdeep Bahga, Internet of Things: (A Hands-on Approach), Universities Press (INDIA) Private Limited, 2014, 1st Edition.

Reference Books

1. Michael Miller, The Internet of Things: How Smart TVs, Smart Cars, Smart Homes, and Smart Cities Are Changing the World, kindle version.
2. Francisda Costa, Rethinking the Internet of Things: A Scalable Approach to Connecting Everything, Apress Publications, 2013, 1st Edition,.
3. Waltenequs Dargie, Christian Poellabauer, "Fundamentals of Wireless Sensor Networks: Theory and Practice
4. CunoPfister, Getting Started with the Internet of Things, O'Reilly Media, 2011.



Web Reference

1. <https://www.simplilearn.com>
2. <https://www.javatpoint.com>
3. <https://www.w3schools.com>

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Programme Outcomes
CO1	Gain the basic knowledge about IoT and they will be able to use IoT related products in real life.	PO1, PO2, PO3, PO4, PO5, PO6
CO2	Understand IoT Access Architecture and Protocols.	PO1, PO2, PO3, PO4, PO5, PO6
CO3	Helps to rely less on physical resources and started to do their work smarter.	PO1, PO2, PO3, PO4, PO5, PO6
CO4	Describe Design & Development of	PO1, PO2, PO3, PO4, PO5, PO6
CO5	IoT Know IoT supporting services.	PO1, PO2, PO3, PO4, PO5, PO6

Mapping of COs with PSOs

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	M	-	-	M	-	M
CO2	M	L	-	L	S	L
CO3	S	-	L	L	-	L
CO4	M	-	-	M	L	M
CO5	M	-	-	M	-	M

3 – Strong

2 – Medium

1 – Low



Programme: B.Sc., Information Technology				
Elective – VI		Course Code: 23UIT6E08		Course Title: Artificial Intelligence
Semester	Hours/Week	Total Hours	Credits	Total Marks
VI	4	90	3	100

Course Objectives

1. To learn various concepts of AI Techniques.
2. To learn various Search Algorithm in AI.
3. To learn probabilistic reasoning and models in AI.
4. To learn about Markov Decision Process.
5. To learn various type of Reinforcement learning..

UNIT – I

Introduction: Concept of AI, history, current status, scope, agents, environments, Problem Formulations, Review of tree and graph structures, State space representation, Search graph and Search tree.

UNIT – II

Search Algorithms : Random search, Search with closed and open list, Depth first and Breadth first search, Heuristic search, Best first search, A* algorithm, Game Search.

UNIT – III

Probabilistic Reasoning : Probability, conditional probability, Bayes Rule, Bayesian Networks- representation, construction and inference, temporal model, hidden Markov model.

UNIT – IV

Markov Decision process : MDP formulation, utility theory, utility functions, value iteration, policy iteration and partially observable MDPs.

UNIT – V

Reinforcement Learning : Passive reinforcement learning, direct utility estimation, adaptive dynamic programming, temporal difference learning, active reinforcement learning- Q learning.



Text Book

1. Stuart Russell and Peter Norvig, “Artificial Intelligence: A Modern Approach” , 3rd Edition, Prentice Hall.
2. Elaine Rich and Kevin Knight, “Artificial Intelligence”, Tata McGraw Hill

Reference Books

1. Trivedi, M.C., “A Classical Approach to Artificial Intelligence”, Khanna Publishing House, Delhi.
- M. Saroj Kaushik, “Artificial Intelligence”, Cengage Learning India, M011
3. David Poole and Aln Mackworth, “Artificial Intelligence: Foundations for Computational Agents”, Cambridge University Press M010

Web Resources

1. NPTEL&MOOCcoursestitledArtificialIntelligenceandExpertSystems
- M. <https://nptel.ac.in/courses/106106140/>
3. <https://nptel.ac.in/courses/1061061M6/>

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the various concepts of AI Techniques.	K1 & KM
COM	Understand various Search Algorithm in AI.	K1, KM & K3
CO3	Understand probabilistic reasoning and models in AI.	KM, K3 & K4
CO4	Understand Markov Decision Process.	K4 & K5
CO5	Understand various type of Reinforcement learning Techniques.	K4, K5 & K6

K1 – Remember, KM – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create



Mapping of COs with POs

PO CO	PO1	POM	PO3	PO4	PO5
C01	S				
C02	S	S			
C03				S	
C04				S	S
C05			S		

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
Elective – VII		Course Code: 23UIT6E10		Course Title: Trends in Computing
Semester	Hours/Week	Total Hours	Credits	Total Marks
V	6	90	3	100

Course Objectives

1. Learning current trends in various computer science and information technology fields.
2. Learning various fields of Cloud computing, Green computing ,the Edge and Fog computing technology.
3. To learn about Architecture and Application design of Cloud, Edge & fog computing.
4. To know computing and to improve security services of computing technologies.
- 5.
6. To learn the various Case Studies in Cloud, Edge & fog Computing..

UNIT – I

Era of Cloud Computing: Introduction – Components of Cloud Computing – Cloud Types: Private, Public and Hybrid clouds – Limitations of the Cloud - **Virtualization:** Structure and Mechanisms.

UNIT – II

Cloud computing Services: Software as a Service(SaaS) – Platform as a Service(PaaS)- Infrastructure as a Service(IaaS)-Database as a Service (DBaaS)- Recent Trends in cloud computing and Standards-**Data Security in Cloud** – Risks and Challenges with Cloud Data-Security as a Service.

UNIT – III

Edge Computing: Edge Computing and Its Essentials: Introduction- Edge Computing Architecture- Advantages and Limitations of Edge Computing Systems- Edge Computing Interfaces and Devices - Edge Analytics: Edge Data Analytics – Potential of Edge Analytics – Architecture of Edge Analytics – Case study

UNIT – IV



Edge Data storage Security: Edge-Based Attack Detection and Prevention-Edge Computing Use Cases and Case Studies: Edge Computing High- Potential Use Cases.

Introduction to green computing–Calculating carbon footprint-Choosing Green PC path: A green make over – Buying green computer- Choosing Earth Friendly peripherals.

UNIT – V

Fog Computing: Introduction to Fog computing – Architecture - Characteristics - Fog Computing Services – Fog Resource Estimation and Its Challenges-Fog computing on 5G networks – Fog computing Use cases and Case studies.

Text Book

1. Kailas Jayaswal, Jagannath Kallakurchi, Donald J. Houde, Dr. Devan Shah “ Cloud Computing –Black Book” Edition :M0M0 (UNIT I & II : CHAPTER 1, M, 3, 9, 11)
2. K. Anitha Kumari G. Sudha Sadasivam D. Dharani M. Niranjanamurthy, “EDGE COMPUTING Fundamentals, Advances and Applications”, First Edition M0MM, CRC Press. (UNIT III & IV : CHAPTER 1, M , 3, 4, 5, 6)
3. Woody Leonhard and Katherine Murray (M009) ,Green Home Computing for Dummies, Willey Publishing Inc. (UNIT IV : CHAPTER M , 5, 6, 7)
4. Evangelos Markakis, George Mastorakis, Constandinos X. Mavromoutakis and Evangelos pallis “Cloud and Fog computing in 5G mobile Networks” ,First edition M017. (UNIT V: CHAPTER M)

Reference Books

1. RajKumar Buyya, Christian Vecchiola, S. Thamarai Selvi, (M013), Mastering Cloud Computing, McGraw Hill Education.
2. Michael Miller, (M009), Cloud Computing, Pearson Education.
3. Shijun Liu Bedir Tekinerdogan Mikio Aoyama Liang-Jie Zhang” Edge Computing – EDGE “ M018.
4. Flavio Bonomi, Rodolfo Milito, Jiang Zhu, Sateesh Addepalli, —Fog Computing and Its Role in the Internet of Things, MCC’1M, August 17, M01M, Helsinki, Finland. Copyright M01M.
5. Amir M. Rahmani · Pasi Liljeberg Jürgo-Sören Preden “Fog Computing in the Internet of Things” Springer, M018. (UNIT V: PART/CHAPTER (1.4, M.5)



Web Resources

1. <https://static.googleusercontent.com/media/www.google.com/en//green/pdfs/google-green-computing.pdf> (Case Study)
2. http://whatiscloud.com/basic_concepts_and_terminology/cloud
3. <http://www.computerweekly.com/guides/Using-green-computing-for-improving-energy-efficiency>

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Outline the concepts, applications, benefits and limitations of various computing paradigms.	K1, KM & K3
CO2	Classify the computing technologies based on its architecture and infrastructure and identify its strategies.	KM & K3
CO3	Examine various cloud services, Security threat exposure within a cloudcomputing infrastructure.	K3, K4 & K5
CO4	Asses the problems and solutions involved in various stages of different computing environments.	K4 & K5
CO5	Discuss the importance of cloud, edge and Fog technology and implement innovative ideas and practices for regulating green IT.	K5 & K6

K1 – Remember, KM – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO \ CO	PO1	POM	PO3	PO4	PO5
CO1	S				
CO2	S	S			
CO3				S	
CO4				S	S
CO5			S		

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
Elective – VI		Course Code: 23UIT6E11		Course Title: Big Data Analytics
Semester	Hours/Week	Total Hours	Credits	Total Marks
VI	4	90	3	100

Course Objectives

1. Understand the Big Data Platform and its Use cases, Map Reduce Jobs
2. To identify and understand the basics of cluster and decision tree
3. To study about the Association Rules, Recommendation System
4. To learn about the concept of stream
5. Understand the concepts of NoSQL Databases

UNIT – I

Evolution of Big data — Best Practices for Big data Analytics — Big data characteristics — Validating — The Promotion of the Value of Big Data — Big Data Use Cases- Characteristics of Big Data Applications — Perception and Quantification of Value - Understanding Big Data Storage — A General Overview of High-Performance Architecture — HDFS — MapReduce and YARN — Map Reduce Programming Model

UNIT – II

Search Algorithms : Random search, Search with closed and open list, Depth first and Breadth first search, Heuristic search, Best first search, A* algorithm, Game Search.

Advanced Analytical Theory and Methods: Overview of Clustering — K-means — Use Cases — Overview of the Method — Determining the Number of Clusters — Diagnostics — Reasons to Choose and Cautions .- Classification: Decision Trees — Overview of a Decision Tree — The General Algorithm — Decision Tree Algorithms — Evaluating a Decision Tree — Decision Trees in R — Naïve Bayes — Bayes? Theorem — Naïve Bayes Classifier.

UNIT – III

Advanced Analytical Theory and Methods: Association Rules — Overview — Apriori Algorithm — Evaluation of Candidate Rules — Applications of Association Rules — Finding Association & finding similarity — Recommendation System: Collaborative Recommendation- Content Based Recommendation — Knowledge Based Recommendation- Hybrid Recommendation Approaches.

**UNIT – IV**

Introduction to Streams Concepts — Stream Data Model and Architecture — Stream Computing, Sampling Data in a Stream — Filtering Streams — Counting Distinct Elements in a Stream — Estimating moments — Counting oneness in a Window — Decaying Window — Real time Analytics Platform(RTAP) applications — Case Studies — Real Time Sentiment Analysis, Stock Market Predictions. Using Graph Analytics for Big Data: Graph Analytics

UNIT – V

NoSQL Databases : Schema-less Models?: Increasing Flexibility for Data Manipulation-Key Value Stores- Document Stores — Tabular Stores — Object Data Stores — Graph Databases Hive — Sharding — Hbase — Analyzing big data with twitter — Big data for E-Commerce Big data for blogs — Review of Basic Data Analytic Methods using R.

Text Book

1. AnandRajaraman and Jeffrey David Ullman, “Mining of Massive Datasets”, Cambridge University Press, 2012.

Reference Books

1. David Loshin, “Big Data Analytics: From Strategic Planning to Enterprise Integration with Tools, Techniques, NoSQL, and Graph”, Morgan Kaufmann/El sevier Publishers, 2013
2. EMC Education Services, “Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data”, Wiley publishers, 2015.

Web Resources

1. <https://www.simplilearn.com>
2. https://www.sas.com/en_us/insights/analytics/big-data-analytics.html



Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Programme Outcomes
CO1	Work with big data tools and its analysis techniques.	PO1
CO2	Analyze data by utilizing clustering and classification algorithms.	PO1, PO2
CO3	Learn and apply different mining algorithms and recommendation systems for large volumes of data.	PO4, PO6
CO4	Perform analytics on data streams.	PO4, PO5, PO6
CO5	Learn NoSQL databases and management.	PO3, PO8

Mapping of COs with POs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	S							
CO 2	M	S						
CO 3				S		S		
CO 4				S	S	M		
CO 5			S					S

S – Strong

M – Medium

L – Low



Skill Based Elective Course (SBEC)



Programme: B.Sc., Information Technology				
SEC – III		Course Code: 23UITS01		Course Title: Introduction to HTML
Semester	Hours/Week	Total Hours	Credits	Total Marks
II	2	30	2	100

Course Objectives

1. Insert a graphic within a web page..
2. Create a link within a web page.
3. Create a table within a web page.
4. Insert heading levels within a web page.
5. Insert ordered and unordered lists within a web page. Create a web page.

UNIT – I

Introduction :Web Basics: What is Internet – Web browsers – What is Web page – HTML Basics: Understanding tags.

UNIT – II

Tags for Document structure(HTML, Head, Body Tag). Block level text elements: Headings paragraph(<p> tag) – Font style elements: (bold, italic, font, small, strong, strike, big tags).

UNIT – III

Lists: Types of lists: Ordered, Unordered – Nesting Lists – Other tags: Marquee, HR, BR- Using Images – Creating Hyperlinks.

UNIT – IV

Tables: Creating basic Table, Table elements, Caption – Table and cell alignment – Rowspan, Colspan – Cell padding.

UNIT – V

Frames: Frameset – Targeted Links – No frame – Forms : Input, Textarea, Select, Option.

Text Books

1. Thomas Michaud, “Foundations of Web Design: Introduction to HTML & CSS”.
2. “Mastering HTML5 and CSS3 Made Easy”, TeachUComp Inc., M014.



Reference Websites

1. <https://www.teachucomp.com/samples/html/5/manuals/Mastering-HTML5-CSS3.pdf>
2. <https://www.w3schools.com/html/default.asp>

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Knows the basic concept in HTML Concept of resources in HTML	K1 & KM
CO2	Knows Design concept. Concept of Meta Data Understand the concept of save the files.	KM & K5
CO3	Understand the page formatting. Concept of list	K1, KM, K3 & K4
CO4	Creating Links. Know the concept of creating link to email address	K5 & K6

K1 – Remember, KM – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	M	M	S	S	S
CO2	S	M	S	S	S
CO3	S	S	S	S	S
CO4	S	M	S	S	S
CO5	S	S	S	M	S

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
SEC – IV		Course Code: 23UIT3S02		Course Title: Web Designing
Semester	Hours/Week	Total Hours	Credits	Total Marks
III	2	30	2	100

Course Objectives

1. Understand the basics of HTML and its components
2. To study about the Graphics in HTML
3. Understand and apply the concepts of XML and DHTML
4. Understand the concept of JavaScript
5. To identify and understand the goals and objectives of the Ajax

UNIT – I

HTML: HTML-Introduction-tag basics- page structure-adding comments working with texts, paragraphs and line break. Emphasizing text- heading and horizontal rules-list-font size, face and color-alignment links-tables-frames.

UNIT – II

Forms & Images Using Html: Graphics: Introduction-How to work efficiently with images in web pages, image maps, GIF animation, adding multimedia, data collection with html forms textbox, password, list box, combo box, text area, tools for building web page front page.

UNIT – III

XML & DHTML: Cascading style sheet (CSS)-what is CSS-Why we use CSS-adding CSS to your web pages-Grouping styles-extensible markup language (XML).

UNIT – IV

Dynamic HTML: Document object model (DCOM)-Accessing HTML & CSS through DCOM Dynamic content styles & positioning-Event bubbling-data binding.

JavaScript: Client-side scripting, What is JavaScript, How to develop JavaScript, simple JavaScript, variables, functions, conditions, loops and repetition.

UNIT – V

Advance script, JavaScript and objects, JavaScript own objects, the DOM and web browser environments, forms and validations.



Text Books

1. Pankaj Sharma, “Web Technology”, SkKataria& Sons Bangalore M011.
2. Mike Mcgrath, “Java Script”, Dream Tech Press M006, 1st Edition.
3. Achyut S Godbole&AtulKahate, “Web Technologies”, M00M, Mnd Edition.

Refernce Book:

1. Laura Lemay, RafeColburn , Jennifer Kyrnin, “Mastering HTML, CSS & Javascript Web Publishing”, M016.
2. DT Editorial Services (Author), “HTML 5 Black Book (Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP, jQuery)”, Paperback M016, Mnd Edition..

Reference Websites

NPTEL & MOOC courses titled Web Design and Development

1. <https://www.geeksforgeeks.org>

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Develop working knowledge of HTML	K1 & KM
CO2	Ability to Develop and publish Web pages using Hypertext Markup Language (HTML).	KM & K5
CO3	Ability to optimize page styles and layout with Cascading Style Sheets (CSS).	KM, K3 K4 & K6
CO4	Ability to develop a java script	K5 & K6
CO5	An ability to develop web application using Ajax.	K6

K1 – Remember, KM – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create



Mapping of COs with POs

PO \ CO	PO1	POM	PO3	PO4	PO5
CO1	S		M		
CO2	S	M	L		
CO3			S		M
CO4	S	M	M		
CO5		M			

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
SEC – V		Course Code: 23UIT3S03		Course Title: Office Automation
Semester	Hours/Week	Total Hours	Credits	Total Marks
III	2	30	2	100

Course Objectives

1. Understand the basics of computer systems and its components.
2. Understand and apply the basic concepts of a word processing package.
3. Understand and apply the basic concepts of electronic spreadsheet software.
4. Understand and apply the basic concepts of database management system.
5. Understand and create a presentation using PowerPoint tool.

UNIT – I

Introductory concepts: Memory unit– CPU-Input Devices: Key board, Mouse and Scanner. Output devices: Monitor, Printer. Introduction to Operating systems & its features: DOS– UNIX–Windows. Introduction to Programming Languages.

UNIT – II

Word Processing: Open, Save and close word document; Editing text – tools, formatting, bullets; Spell Checker - Document formatting – Paragraph alignment, indentation, headers and footers, numbering; printing–Preview, options, merge.

UNIT – III

Spreadsheets : Excel–opening, entering text and data, formatting, navigating; Formulas–entering, handling and copying; Charts–creating, formatting and printing, analysis tables, preparation of financial statements, introduction to data analytics

UNIT – IV

Database Concepts: The concept of data base management system; Data field, records, and files, Sorting and indexing data; Searching records. Designing queries, and reports; Linking of datafiles; Understanding Programming environment in DBMS; Developing menu drive applications in query language (MS–Access).

**UNIT – V**

Power point: Introduction to Power point - Features – Understanding slide typecasting & viewing slides – creating slide shows. Applying special object – including objects & pictures – Slide transition–Animation effects, audio inclusion, timers.

Text Books

1. Peter Norton, “Introduction to Computers”–Tata Mc Graw-Hill..

Reference Book:

2. Jennifer Ackerman Kettel, Guy Hat-Davis, Curt Simmons, “Microsoft M003”, Tata McGrawHill.

Reference Websites

1. <https://www.udemy.com/course/office-automation-certificate-course/>
2. <https://www.javatpoint.com/automation-tools>

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Possess the knowledge on the basics of computers and its components	K1 & KM
CO2	Gain knowledge on Creating Documents, spreadsheet and presentation.	K1, KM & K5
CO3	Learn the concepts of Database and implement the Query in Database.	KM, K3 K4 & K6
CO4	Demonstrate the understanding of different automation tools.	K5 & K6
CO5	Utilize the automation tools for documentation, calculation and presentation purpose.	K4 & K5

K1 – Remember, KM – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create



Mapping of COs with POs

PO CO	PO1	POM	PO3	PO4	PO5
CO1	M	S	M		
CO2	S	M	S		
CO3		S	S		M
CO4			S	L	M
CO5				M	

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
SEC – VI		Course Code: 23UIT4S04		Course Title PHP Programming
Semester	Hours/Week	Total Hours	Credits	Total Marks
IV	2	30	2	100

Course Objectives

1. To enable the students to understand, analyze and build dynamic web pages using PHP and jQuery with MySQL database.

UNIT – I

Introduction to PHP : Language Basics : Lexical Structure – Data Types – Variables - Expressions and Operators – Flow – Control statements – Embedding PHP in Web Pages

Exercises:

1. Control Structures
2. Working with Forms.

UNIT – II

Functions : Defining a function – Variable Scope - Function Parameters – Strings : Encoding and Escaping – Comparing Strings – Manipulating and Searching Strings – Arrays: Single and Multidimensional Arrays – Traversing Arrays – Sorting

Exercises:

3. String Manipulations
4. Arrays
5. Functions
6. Sorting

UNIT – III

Classes and Objects – Introspection – Serialization – Web Techniques: Processing Forms – Setting Response Headers – Maintaining State : Cookies and Session-Graphics

Exercises:

7. Classes and Objects
8. Cookies and Sessions
9. Graphics

UNIT – IV



Working with MySQL Database: Select data from a single table – Select data from multiple tables- Performing DML operations

Exercises:

10. Working with single table
11. Working with multiple tables

UNIT – V

jQuery Fundamentals: Requirements of jQuery- JavaScript Premier – jQuery Core – DOM Selection and Manipulation – Event Handling – HTML Forms and Data – jQuery with PHP

Exercises:

- 1M. Event Handling
13. Handling HTML Forms with jQuery

Text Books

1. Kevin Tatroe, Peter MacIntyre, Rasmus Lerdorf, “Programming PHP”, O’Reilly Publications, Third Edition
2. Joel Murach, Ray Harris (M010), “PHP and MySQL”, Shroff Publishers & Distributors
3. Cesar Otero, Rob Lorsen (M01M), “Professional jQuery”, John Wiley Sons & Inc.

Reference Book:

1. W. Jason Gilmore (M010), “Beginning PHP & MySql”, Apress
2. Larry Ullman (M008), “PHP 6 and MySQL 5”, Pearson Education
3. John Coggeshall (M006), “PHP 5”, Pearson Education
4. Michale C. Glass (M004), “Beginning PHP, Apache, MySQL Web Development”, Wiley DreamTech Press
5. Robin Nixon (M013), “Learning PHP, MySQL, JavaScript & CSS”, O’Reilly, Mnd Edition
6. Jack Franlin (M013), “Beginning jQuery”, Apress, Springer Science

Reference Websites

4. <http://www.w3schools.com/jquery/>
5. <http://www.ccc.commnet.edu/faculty/sfreeman/cst%20M0M50/jqueryNotes.pdf>
6. <http://www.w3schools.com/php/>
7. <http://www.tutorialspoint.com/php/>

Course Outcomes (COs)



On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Demonstrate simple programs using PHP and jQuery	KM,K3 & K4
CO2	Apply the interface setup, styles & themes for the given application	KM,K3,K4 & K5
CO3	Analyze the problem and add necessary user interface components, multimedia components and web data source into the application	KM, K3 K4 & K6
CO4	Evaluate the results by implementing the correct techniques on the web form	K4,K5 & K6
CO5	Construct web applications with the facilitated components in PHP and jQuery	K3,K4,K5 &K6

K1 – Remember, KM – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO \ CO	PO1	POM	PO3	PO4	PO5
CO1	S	M	M	S	S
CO2	S	S	M	M	M
CO3	S	M	S	M	M
CO4	S	M	M	M	M
CO5	S	M	M	S	M

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
SEC – VII		Course Code: 23UIT4S05		Course Title: Multimedia Systems
Semester	Hours/Week	Total Hours	Credits	Total Marks
IV	2	30	2	100

Course Objectives

1. Understand the basics of Multimedia
2. To study about the Image File Formats, Sounds Audio File Formats
3. Understand the concepts of Animation and Digital Video Containers
4. To study about the Stage of Multimedia Project
5. Understand the concept of Ownership of Content Created for Project Acquiring Talent.

UNIT – I

Multimedia Definition-Use Of Multimedia-Delivering Multimedia- Text: About Fonts and Faces - Using Text in Multimedia -Computers and Text Font Editing and Design Tools- Hypermedia and Hypertext..

UNIT – II

Images: Plan Approach - Organize Tools - Configure Computer Workspace -Making Still Images - Color - Image File Formats. Sound: The Power of Sound -Digital Audio-Midi Audio-Midivis. Digital Audio-Multimedia System Sounds Audio File Formats -Vaughan's Law of Multimedia Minimums - Adding Sound to Multimedia Project.

UNIT – III

Animation: The Power of Motion-Principles of Animation-Animation by Computer - Making Animations that Work. Video: Using Video - Working with Video and Displays- Digital Video Containers-Obtaining Video Clips -Shooting and Editing Video

UNIT – IV

Making Multimedia: The Stage of Multimedia Project - The Intangible Needs -The Hardware Needs - The Software Needs - An Authoring Systems Needs-Multimedia Production Team.

UNIT – V

Validation Controls – AdRotator Control. Working with Data: ADO.NET Fundamentals:– Direct Data Access – Disconnected Data Access - Data Binding: Data Binding with



ADO.NET –Data Source Controls - The Data Controls: The GridView – Formatting the GridView – Selecting GridView Row – Editing, Sorting and Paging the GridView-Generating Crystal ReportsPlanningandCosting:TheProcessofMakingMultimedia-Scheduling-Estimating - RFPs and Bid Proposals. Designing and Producing - Content andTalent:AcquiringContent-OwnershipofContentCreatedforProject-AcquiringTalent.

Text Books

1. TayVaughan,"Multimedia:MakingItWork",8thEdition,Osborne/McGraw-Hill,M001.

Reference Book:

1. RalfSteinmetz&KlaraNahrstedt"MultimediaComputing,Communication&Application s",PearsonEducation,M01M.

Reference Websites

1. <https://www.geeksforgeeks.org/multimedia-systems-with-features-or-characteristics/>

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	understand the concepts, importance, application and the process of developing multimedia	K1 & KM
CO2	to have basic knowledge and understanding about image related processings	K1,KM & K5
CO3	To understand the framework of frames and bit images to animations	KM, K3 & K4
CO4	Speaks about the multimedia projects and stages of requirement in phases of project.	K4,K5 & K6
CO5	Understanding the concept of cost involved in multimedia planning, designing, and producing	K3,K4 &K5

K1 – Remember, KM – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create



Mapping of COs with POs

PO CO	PO1	POM	PO3	PO4	PO5
C01	S				
C02	M	S			
C03				S	
C04				S	S
C05			S		

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
PCSEC SEC - VIII		Course Code: 23UIT6S06		Course Title: Robotics and Its Applications
Semester	Hours/Week	Total Hours	Credits	Total Marks
VI	4	60	2	100

Course Objectives

1. To understand the robotics fundamentals
2. Understand the sensors and matrix methods
3. Understand the Localization: Self-localizations and mapping
4. To study about the concept of Path Planning, Vision system
5. To learn about the concept of robot artificial intelligence

UNIT – I

Introduction: Introduction, brief history, components of robotics, classification, workspace, work-envelop, motion of robotic arm, end-effectors and its types, service robot and its application, Artificial Intelligence in Robotics

UNIT – II

Actuators and sensors :Types of actuators, stepper-DC-servo-and brushless motors- model of a DC servo motor-types of transmissions-purpose of sensor-internal and external sensor-common sensors-encoders tachometers-strain gauge based force torque sensor-proximity and distance measuring sensors

Kinematics of robots: Representation of joints and frames, frames transformation, homogeneous matrix, D-H matrix, Forward and inverse kinematics: two link planar (RR) and spherical robot (RRP). Mobile robot Kinematics: Differential wheel mobile robot

UNIT – III

Localization: Self-localizations and mapping - Challenges in localizations – IR based localizations – vision based localizations – Ultrasonic based localizations - GPS localization systems

**UNIT – IV**

Path Planning: Introduction, path planning-overview-road map path planning-cell decomposition path planning potential field path planning-obstacle avoidance-case studies

Vision system: Robotic vision systems-image representation-object recognition-and categorization-depth measurement- image data compression-visual inspection-software considerations

UNIT – V

Application: Ariel robots-collision avoidance robots for agriculture-mining-exploration-underwater-civilian- and military applications-nuclear applications-space Applications-Industrial robots-artificial intelligence in robots-application of robots in material handling-continuous arc welding-spot welding-spray painting-assembly operation-cleaning-etc.

Text Books

1. RichardD.Klafter. Thomas Achmielewski and MickaelNegin, Robotic Engineering and Integrated Approach, Prentice Hall India-Newdelhi-M001
2. SaeedB.Nikku, Introduction to robotics, analysis, control and applications, Wiley-India, M nd edition M011

Refernce Book:

1. Industrial robotic technology-programming and application by M.P.Groover et.al, McGrawhillM008
2. Robotics technology and flexible automation by S.R.Deb, THH-M009.

Reference Websites

1. https://www.tutorialspoint.com/artificial_intelligence/artificial_intelligence_robotics.htm
2. <https://www.geeksforgeeks.org/robotics-introduction/>



Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the different physical forms of robot architectures.	K1 & KM
CO2	Kinematically model simple manipulator and mobile robots.	K1, KM & K5
CO3	Mathematically describe a kinematic robot system	KM, K3, K4 & K5
CO4	Analyze manipulation and navigation problems using knowledge of coordinate frames, kinematics, optimization, control, and uncertainty.	K3, K4, K5 & K6
CO5	Program robotics algorithms related to kinematics, control, optimization, and uncertainty.	K3, K4 & K5

K1 – Remember, KM – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	S				
CO2	M	S			
CO3				S	
CO4				S	S
CO5			S		

S – Strong

M – Medium

L – Low



Non Major Elective Course (NME)



Programme: B.Sc., Information Technology				
NME		Course Code: 23UIT1N01		Course Title: Fundamentals Of Information Technology
Semester	Hours/Week	Total Hours	Credits	Total Marks
I	2	30	2	100

1. Course Objectives

1. Understand basic concepts and terminology of information technology.
2. Have a basic understanding of personal computers and their operation
3. Be able to identify data storage and its usage
4. Get great knowledge of software and its functionalities
5. Understand about operating system and their uses

UNIT – I

Introduction to Computers:

Introduction, Definition, Characteristics of computer, Evolution of Computer, Block Diagram Of a computer, Generations of Computer, Classification Of Computers, Applications of Computer, Capabilities and limitations of computer

UNIT – II

Basic Computer Organization:

Role of I/O devices in a computer system. Input Units: Keyboard, Terminals and its types. Pointing Devices, Scanners and its types, Voice Recognition Systems, Vision Input System, Touch Screen, Output Units: Monitors and its types. Printers: Impact Printers and its types. Non Impact Printers and its types, Plotters, types of plotters, Sound cards, Speakers.

UNIT – III

Storage Fundamentals:

Primary Vs Secondary Storage, Data storage & retrieval methods. Primary Storage: RAM ROM, PROM, EPROM, EEPROM. Secondary Storage: Magnetic Tapes, Magnetic Disks. Cartridge tape, hard disks, Floppy disks Optical Disks, Compact Disks, Zip Drive, Flash Drives



UNIT – IV

Software:

Software and its needs, Types of S/W. System Software: Operating System, Utility Programs
Programming Language: Machine Language, Assembly Language, High Level Language
their advantages & disadvantages. Application S/W and its types: Word Processing, Spread
Sheets Presentation, Graphics, DBMS s/w

UNIT – V

Operating System:

Functions, Measuring System Performance, Assemblers, Compilers and Interpreters. Batch
Processing, Multiprogramming, Multi Tasking, Multiprocessing, Time Sharing, DOS,
Windows, Unix/Linux.

Text Books

1. Anoop Mathew, S. Kavitha Murugesan (2009), “ Fundamental of Information Technology”, Majestic Books.
2. Alexis Leon, Mathews Leon,” Fundamental of Information Technology”, 2nd Edition.
3. S. K Bansal, “Fundamental of Information Technology”.

Reference Books

1. Bhardwaj Sushil Puneet Kumar, “Fundamental of Information Technology”
2. GG WILKINSON, “Fundamentals of Information Technology”, Wiley-Blackwell
3. A Ravichandran , “Fundamentals of Information Technology”, Khanna Book Publishing

Reference Websites

1. <https://testbook.com/learn/computer-fundamentals>
2. <https://www.tutorialsmate.com/2020/04/computer-fundamentals-tutorial.html>
3. <https://www.javatpoint.com/computer-fundamentals-tutorial>
4. https://www.tutorialspoint.com/computer_fundamentals/index.htm
5. <https://www.nios.ac.in/media/documents/sec229new/Lesson1.pdf>



Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn the basics of computer, Construct the structure of the required things in computer, learn how to use it.	PO1, PO2, PO3, PO4, PO5, PO6
CO2	Develop organizational structure using for the devices present currently under input or output unit.	PO1, PO2, PO3, PO4, PO5, PO6
CO3	Concept of storing data in computer using two header namely RAM and ROM with different types of ROM with advancement in storage basis.	PO1, PO2, PO3, PO4, PO5, PO6
CO4	Work with different software, Write program in the software and applications of software.	PO1, PO2, PO3, PO4, PO5, PO6
	Usage of Operating system in information technology which really acts as a interpreter between software and hardware.	PO1, PO2, PO3, PO4, PO5, PO6

Mapping of COs with POs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO 1	3	3	3	3	3	3
CO 2	3	3	3	3	3	3
CO 3	3	3	3	3	3	3
CO 4	3	3	3	3	2	3
CO 5	3	3	2	3	3	2

S – Strong

M – Medium

L – Low

Programme: B.Sc., Information Technology



NME		Course Code: 23UIT1N02		Course Title: Introduction to HTML	
Semester	Hours/Week	Total Hours	Credits	Total Marks	
I	2	30	2	100	

Course Objectives

1. Insert a graphic within a web page..
2. Create a link within a web page.
3. Create a table within a web page.
4. Insert heading levels within a web page.
5. Insert ordered and unordered lists within a web page. Create a web page.

UNIT – I

Introduction :Web Basics: What is Internet – Web browsers – What is Web page – HTML Basics: Understanding tags.

UNIT – II

Tags for Document structure(HTML, Head, Body Tag). Block level text elements: Headings paragraph(<p> tag) – Font style elements: (bold, italic, font, small, strong, strike, big tags).

UNIT – III

Lists: Types of lists: Ordered, Unordered – Nesting Lists – Other tags: Marquee, HR, BR- Using Images – Creating Hyperlinks.

UNIT – IV

Tables: Creating basic Table, Table elements, Caption – Table and cell alignment – Rowspan, Colspan – Cell padding.

UNIT – V

Frames: Frameset – Targeted Links – No frame – Forms : Input, Textarea, Select, Option.

Text Books

1. Thomas Michaud, “Foundations of Web Design: Introduction to HTML & CSS”.
- M. “Mastering HTML5 and CSS3 Made Easy”, TeachUComp Inc., M014.

Reference Websites



1. <https://www.teachucomp.com/samples/html/5/manuals/Mastering-HTML5-CSS3.pdf>

M. <https://www.w3schools.com/html/default.asp>

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Knows the basic concept in HTML Concept of resources in HTML	K1 & KM
CO2	Knows Design concept. Concept of Meta Data Understand the concept of save the files.	KM & K5
CO3	Understand the page formatting. Concept of list	K1, KM, K3 & K4
CO4	Creating Links. Know the concept of creating link to email address	K5 & K6

K1 – Remember, KM – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO \ CO	PO1	POM	PO3	PO4	PO5
CO1	M	M	S	S	S
CO2	S	M	S	S	S
CO3	S	S	S	S	S
CO4	S	M	S	S	S
CO5	S	S	S	M	S

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
NME		Course Code: 23UITMN03		Course Title: Multimedia Lab
Semester	Hours/Week	Total Hours	Credits	Total Marks
II	2	30	2	100

Course Objectives

1. Understands the basics of multimedia
2. Acquire knowledge of image editing and animation techniques.
3. Apply multimedia concepts to real world projects

UNIT – I

GIMP's Tools- Taking Advantage of Paths - Working with Layers and masks - Using Channels

Exercises:

1. Enlarge a Logo using path
- M. Create an ink drawing using path
3. Replace Background of image using Channels.

UNIT – II

Manipulating Images: Transforming Images - Using The Image Tools - Adjusting Colors - Working with Text - Painting in Gimp: Creating new brushes - Enhancing Photos - Exploring Filters and Effects.

Exercises:

1. Design Front Cover for a Book.
2. Create a customized logo
3. Use clone tool to remove text from an image
4. Remove Red eye using Filter.

UNIT – III

Using GIMP animation package - Managing the Frames of Image Sequence with GAP - Morphing - onion skinning - Creating a Storyboard.

Exercises:

1. Morphing - Create smooth transitions from one image to another.
- M. Create a Story board for your project.

**UNIT – IV**

Flash: Introduction - Creating and Editing Objects - Color and Text. Animations: Frame- by-frame animation-Motion Tweening- Motion Guides

1. Creating Frame-by-frame Animation
- M. Create a Motion Tween for Graphic and Text Object
3. Create a Motion guide Layer.

UNIT – V

Shape Tweening - Masking - Interactivity: Adding Script to Buttons - Testing and Publishing.

Exercises:

1. Create a Shape Tween for Graphic Object
- M. Create a Mask Layer
3. Adding buttons with Action Script.

Text Books

1. Jason Van Gumster& Robert Shimonski (M010), “GIMP Bible”, Wiley, Mnd edition.
2. Chris Gover, M010, “Flash CS5: The missing Manual”, 1st Edition, O” Reilly India.

Reference Book:

1. Juan Manuel Ferreyra (M011), “GIMP M.6 Cookbook”, PACK publishing Ltd.
2. Robert Reinhard (M003), “Macromedia Flash MX Bible”, Wiley Dreamtech India Pvt Ltd.

Websites Resource:

1. <https://www.youtube.com/watch?v=T8NIK3RdoIc> (Unit IV: Gimp Video Editing)
2. <https://www.youtube.com/watch?v=Jz9WrbELGYA>



Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Demonstrate understanding and use of multimedia fundamentals	K1 & KM
CO2	Implement appropriate techniques required for editing images and designing animated system	KM,K3 & K5
CO3	Solve various design and implementation issues materialize on the development	K1, KM, K3 & K4
CO4	of multimedia systems	K4,K5 & K6
CO5	Assess different Photo Editing, Video Editing and animation tools and select the	K3,K3,K5&K6

K1 – Remember, KM – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO \ CO	PO1	POM	PO3	PO4	PO5
CO1	M	S	M		
CO2	S	M	S		
CO3		S	S		M
CO4			S	L	M
CO5				M	

S – Strong

M – Medium

L – Low



Programme: B.Sc., Information Technology				
NME		Course Code: 23UIT2N04		Course Title: Understanding Internet
Semester	Hours/Week	Total Hours	Credits	Total Marks
II	2	30	2	100

Course Objectives

1. Knowledge of Internet medium
2. Internet as a mass medium
3. Features of Internet Technology,
4. Internet as a source of infotainment
5. Study of internet audiences and about cyber crime.

UNIT - I

The emergence of internet as a mass medium – the world of world wide web

UNIT - II

Features of internet as a technology.

UNIT - III

Internet as a source of infotainment – classification based on content and style.

UNIT - IV

Demographic and psychographic descriptions of internet audiences – effect of internet on the values and life – styles.

UNIT - V

Present issues such as cybercrime and future possibilities.



Textbooks

1. Barnouw, E and Krishnaswamy S [1990] Indian Film. New York, OUP.
2. Kumar, Keval [1999] Mass Communication in India. Mumbai, Jaico.
3. Srivastava, K M [1992] Media Issues. Sterling Publishers Pvt Ltd..

Reference Books

1. Acharya, R N [1987] Television in India. Manas Publications, New Delhi.
2. Barnouw, E [1974] Documentary – A History of Nonfiction. Oxford, OUP
3. Luthra, H R [1986] Indian Broadcasting. Ministry of I & B, New Delhi.
4. Vasudev, Aruna [1986] The New Indian Cinema. Macmillan India, New Delhi.

Web Reference

1. <https://www.teachucomp.com/samples/html/5/manuals/Mastering-HTML5-CSS3.pdf>
2. <https://www.w3schools.com/html/default.asp>

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Programme Outcomes
CO1	Knows the basic concept in internet	PO1, PO2, PO3, PO4, PO5, PO6
CO2	Concept of mass medium and world wide web	PO1, PO2, PO3, PO4, PO5, PO6
CO3	Knows the concept of internet as a technology.	PO1, PO2, PO3, PO4, PO5, PO6
CO4	Understand the concept of infotainment and classification based on content and style	PO1, PO2, PO3, PO4, PO5, PO6
CO5	Can be able to know about Demographic and psychographic description of internet	PO1, PO2, PO3, PO4, PO5, PO6



Mapping of COs with PSOs

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3
CO2	3	3	2	3	3	3
CO3	2	3	3	3	3	3
CO4	3	3	3	3	3	3
CO5	3	3	3	2	3	3

3 – Strong

2 – Medium

1 – Low