V.V.VANNIAPERUMAL COLLEGE FOR WOMEN
(Belonging to Virudhunagar Hindu Nadars)
An Autonomous Institution Affiliated to Madurai Kamaraj University, Madurai
Reaccredited with 'A++' Grade (4th Cycle) by NAAC
VIRUDHUNAGAR
Quality Education with Wisdom and Values

OUTCOME BASED EDUCATION WITH CHOICE BASED CREDIT SYSTEM

REGULATIONS AND SYLLABUS

(with effect from Academic Year 2025 - 2026)

V.V.Vanniaperumal College for Women, Virudhunagar, established in 1962, offers 13 UG Programmes(Aided), 13 UG Programmes(SF), 13 PG Programmes and 6 Ph.D. Programmes. The curricula for all these Programmes, except Ph.D. Programmes, have been framed as per the guidelines given by the University Grants Commission (UGC) &Tamil Nadu State Council for Higher Education (TANSCHE) under Choice Based Credit System (CBCS) and the guidelines for Outcome Based Education (OBE).

The Departments of Commerce, English, History, Mathematics, Biochemistry and Tamil upgraded as Research Centres offer Ph.D. Programmes as per the norms and regulations of Madurai Kamaraj University, Madurai and do not come under the purview of CBCS.

A. CHOICE BASED CREDIT SYSTEM (CBCS)

The CBCS provides an opportunity for the students to choose Courses from the prescribed Courses. The CBCS is followed as per the guidelines formulated by the UGC. The performance of students is evaluated based on the uniform grading system. Computation of the Cumulative Grade Point Average (CGPA) is made to ensure uniformity in evaluation system.

List of Programmes in which CBCS/Elective Course System is implemented

UG PROGRAMMES

Arts & Humanities	:	History (E.M. & T.M.), English, Tamil
Physical & Life Sciences	:	Mathematics, Zoology, Chemistry, Physics, Biochemistry, Home Science - Nutrition and Dietetics, Costume Design and Fashion, Microbiology, Biotechnology, Computer Science, Information Technology, Data Science, Computer Applications and Computer Applications - Graphic Design
Commerce & Management	:	Commerce, Commerce (Computer Applications), Commerce (Professional Accounting), Business Administration

PG PROGRAMMES

Arts & Humanities	:	History, English, Tamil
Physical & Life Sciences	:	Mathematics, Physics, Chemistry, Biochemistry, Home Science - Nutrition and Dietetics, Biotechnology, Computer Science and Computer Applications (MCA) *
Commerce & Management	:	Commerce, Business Administration (MBA) *

* AICTE approved Programmes

OUTLINE OF CHOICE BASED CREDIT SYSTEM – UG

1. Core Courses
2. Elective Courses
    - Generic Elective Courses
    - Discipline Specific Elective Courses (DSEC)
    - Non Major Elective Courses (NMEC)
3. Skill Enhancement Courses (SEC)
4. Environmental Studies (EVS)
5. Value Education
6. Self Study Courses (Online)
7. Extra Credit Courses (Self Study Courses) (Optional)

List of Non Major Elective Courses (NME)
(2023-2024 onwards)

UG PROGRAMMES

Name of the Course	Course Code	Semester	Department
Introduction to Tourism	23UHIN11	I	History(EM)
Indian Constitution	23UHIN21	II	History(EM)
சுற்றுலா ஓர் அறிமுகம்	23UHIN11	I	History (TM)
இந்திய அரசியலமைப்பு	23UHIN21	II	History(TM)
Popular Literature and Culture	23UENN11	I	English
English for Professions	23UENN21	II	
பேச்சுக்கலைத்திறன்	23UTAN11	I	Tamil
பயன்முறைத் தமிழ்	23UTAN21	II	
Practical Banking Basic Accounting Principles	23UCON11 23UCON22	I II	Commerce (Aided)
Financial Literacy-I Financial Literacy -II	23UCON12 23UCON21	I II	Commerce (SF)
Self-Employment and Startup Business Fundamentals of Marketing	23UCCN11 23UCCN21	I II	Commerce CA (SF)

Women Protection Laws	23UCPN11	I	Commerce (Professional Accounting)
Basic Labour Laws	23UCPN21	II	
Basics of Event Management	23UBAN11	I	Business Administration
Business Management	23UBAN21	II	
Quantitative Aptitude I	23UMTN11	I	Mathematics
Quantitative Aptitude II	23UMTN21	II	
Physics for Everyday life -I	23UPHN11	I	Physics
Physics for Everyday life -II	23UPHN21	II	
Food Chemistry	23UCHN11	I	Chemistry
Drugs and Natural Products	23UCHN21	II	
Ornamental fish farming and Management	23UZYN11	I	Zoology
Biocomposting for Entrepreneurship	23UZYN21	II	
Foundations of Baking and Confectionery	23UHSN11	I	Home Science – Nutrition and Dietetics
Basic Nutrition and Dietetics	23UHSN21	II	
Nutrition and Health	23UBCN11	I	Biochemistry
Life Style Diseases	23UBCN21	II	
Social and Preventive Medicine	23UMBN11	I	Microbiology
Nutrition & Health Hygiene	23UMBN21	II	
Herbal Medicine	23UBON11	I	Biotechnology
Organic farming and Health Management	23UBON21	II	
Basics of Fashion	23UCFN11	I	Costume Design And Fashion
Interior Designing	23UCFN21	II	
Office Automation	23UCSN11	I	Computer Science
Introduction to Internet and HTML 5	23UCSN21	II	
Office Automation	23UITN11	I	Information Technology
Introduction to HTML	23UITN21	II	
Introduction to HTML	23UCAN11	I	Computer Applications
Fundamentals of Computers	23UCAN21	II	
Introduction to HTML	23UGDN11	I	Computer Applications - Graphic Design
Fundamentals of Computers	23UGDN21	II	
Organic Farming	23UBYN11	I	Botany
Nursery and Landscaping	23UBYN12		
Mushroom Cultivation	23UBYN21	II	
Medicinal Botany	23UBYN22		
Cadet Corps for Career Development I	23UNCN11	I	National Cadet Corps
Cadet Corps for Career Development II	23UNCN21	II	

B. OUTCOME BASED EDUCATION (OBE) FRAMEWORK

The core philosophy of Outcome Based Education rests in employing a student - centric learning approach to measure the performance of students based on a set of pre-determined outcomes. The significant advantage of OBE is that it enables a revamp of the curriculum based on the learning outcomes, upgrade of academic resources, quality enhancement in research and integration of technology in the teaching –learning process. It

also helps in bringing clarity among students as to what is expected of them after completion of the Programme in general and the Course in particular. The OBE directs the teachers to channelize their teaching methodologies and evaluation strategies to attain the PEOs and fulfill the Vision and Mission of the Institution.

Vision of the Institution

The founding vision of the Institution is to impart Quality Education to the rural womenfolk and to empower them with knowledge and leadership quality.

Mission of the Institution

The mission of the Institution is to impart liberal education committed to quality and excellence. Its quest is to mould learners into globally competent individuals instilling in them life-oriented skills, personal integrity, leadership qualities and service mindedness.

B.1 Programme Educational Objectives, Programme Outcomes and Programme Specific Outcomes

It is imperative for the institution to set the Programme Educational Objectives (PEOs), Programme Outcomes (POs) and Course Outcomes (COs), consistent with its Vision and Mission statements. The PEOs and the POs should be driven by the mission of the institution and should provide distinctive paths to achieve the stated goals. The PEOs for each Programme have to fulfil the Vision and Mission of the Department offering the Programme.

Vision of the Department of Information Technology

To Promote Academic Excellence and create groomed, technically competent and skilled intellectual IT Professionals

Mission of the Department of Information Technology

- To uplift rural students through advanced quality education in Information Technology.
- To enhance Employability opportunity due to knowledge
- To provide Moral values to turn out to be a responsible citizen
- To develop graduates to meet the challenges of the rapidly changing world.

Programme Educational Objectives (PEOs) of B.Sc. Information Technology Programme

The students will be able

PEO1	to be prepared to gain employment as an IT Professional
PEO2	to function effectively as individuals in the workplace, growing into highly technical or project management and leadership roles.
PEO3	to develop graduates to meet the challenges of the rapidly changing world.

Key Components of the Mission Statement	**P**rogramme **E**ducational **O**bjectives (**PEO**s)		
	PEO1	PEO2	PEO3
Uplift Rural Students	✓		✓
Enhance employability opportunity	✓	✓	✓
provide moral values to turn out to be a responsible citizen		✓	
develop graduates to meet the challenges of the rapidly changing world		✓	✓

B.1.2 Programme Outcomes (POs)

POs shall be based on Graduate Attributes (GAs) of the Programme. The GAs are the attributes expected of a graduate from a Programme in terms of knowledge, skills, attitude and values. The Graduate Attributes include Disciplinary Knowledge, Communication Skills, Critical Thinking, Problem Solving, Analytical Reasoning, Research Related Skills, Co-operation/Team Work, Scientific Reasoning, Reflective Thinking, Information/Digital Literacy, Multicultural Competence, Moral and Ethical Awareness/Reasoning, Leadership Qualities and Lifelong Learning.

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

1 apply effectively the acquired knowledge and skill in the field of Arts, Physical Science, Life Science, Computer Science, Commerce and Management for higher studies and employment. (*Disciplinary Knowledge*)

2 articulate innovative thoughts and ideas proficiently in both in spoken and written forms. (*Communication Skills)*

3 identify, formulate and solve problems in real life situations scientifically / systematically by adapting updated skills in using modern tools and techniques. (*Scientific Reasoning and Problem Solving)*

4 critically analyse, synthesize and evaluate data, theories and ideas to provide valid suggestions through assignments, case studies, Internship and projects for the fullfillment of the local, national and global developmental needs. (*Critical Thinking and Analytical Reasoning)*

5 use ICT in a variety of self-directed lifelong learning activities to face career challenges in the changing environment. (*Digital Literacy, Self - directed and Lifelong Learning)*

6 self-manage and function efficiently as a member or a leader in diverse teams in a multicultural society for nation building. (*Co-operation/Team Work and Multicultural Competence)*

7 uphold the imbibed ethical and moral values in personal, professional and social life for sustainable environment. (*Moral and Ethical Awareness)*

B.1.3 Programme Specific Outcomes (PSOs)

Based on the Programme Outcomes, Programme Specific Outcomes are framed for each UG Programme**.** Programme Specific Outcomes denote what the students would be able to do at the time of graduation. They are Programme specific. It is mandatory that each PO should be mapped to the respective PSO.

PROGRAMME SPECIFIC OUTCOMES

On completion of the B.Sc. Information Technology programme, the students will be able to

PO1 - *Disciplinary Knowledge*

PSO 1.a. apply the principles and working of the hardware and software aspects of computer systems incorporated with the knowledge of related courses to pursue higher studies.

PSO 1.b. identify and solve Technical problems by applying mathematical foundations and algorithmic principles in IT environment to meet industrial challenges and get better placement.

PO2 - *Communication Skills*

PSO 2. a. design and implement a secure and reliable information communication system by using concepts of computer networks, network security and information theory.

PSO 2. b. develop technical project reports and present them orally among the users.

PO3 - *Scientific Reasoning and Problem Solving*

PSO 3. characterize, illustrate and analyze a computer system, component, or algorithm to meet desired needs and to solve computational problems in real world based on their research career pursuits.

PO4 - *Critical Thinking and Analytical Reasoning*

PSO 4. critically analyze the techniques in IT to provide technology based onclusions to transform innovative ideas into reality.

PO5 - *Digital Literacy, Self - directed and Lifelong Learning*

PSO 5.a: use and apply current technical concepts and practices in the core Information Technologies of human computer interaction, programming and networking for higher

studies, research activities and to become successful career, entrepreneurship..

PSO 5.b: be acquainted with the contemporary issues, latest trends in technological development and thereby innovate new ideas by self-directed and lifelong learning.

PO6 - Cooperation/Team Work and Multi-Cultural Competence

PSO 6: work effectively as a member or leader of a team to achieve project target.

PO7 - Moral and Ethical awareness

PSO 7: demonstrate a sense of societal and ethical responsibility in their professional endeavours.

PO-PEO Mapping Matrix

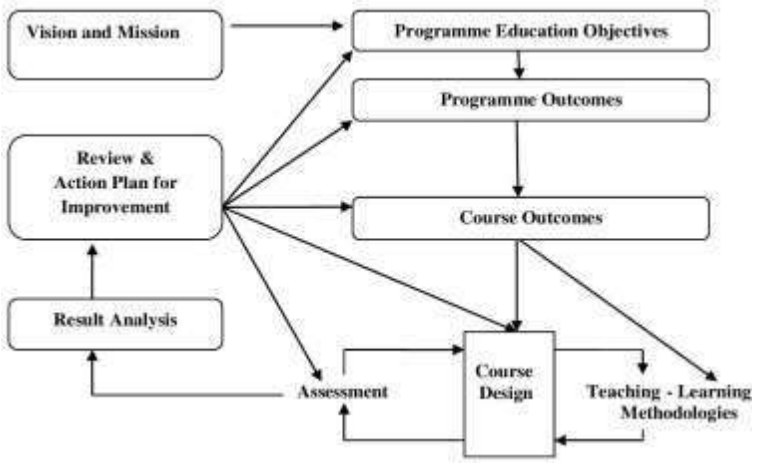
Attainment of PEOs can be measured by a PO-PEO matrix. PEOs should evolve through constant feedback from alumnae, students, industry, management, *etc*. It is mandatory that each PEO should be mapped to at least one of the POs.

PEOs / POs/PSOs	PEO1	PEO2	PEO3
PO1/PSO1.a	-	✓	✓
PO1/PSO1.b	✓	✓	✓
PO2/PSO2.a	✓	✓	-
PO2/PSO2.b	✓	✓	-
PO3/PSO3	-	✓	✓
PO4/PSO4.a	-	✓	✓
PO4/PSO4.b	✓	✓	-
PO5/PSO5	✓	✓	-
PO6/PSO6	-	✓	✓
PO7/PSO7	-	-	✓

B.1.4 Course Outcomes (COs)

Course Outcomes are narrow statements restricted to the Course contents given in five units. Course Outcomes describe what students would be capable of, after learning the contents of the Course. They reflect the level of knowledge gained, skills acquired and attributes developed by the students after learning of Course contents. COs are measurable, attainable and manageable in number. COs contribute to attain POs in such a way that each

CO addresses at least one of the POs and also each PO is reasonably addressed by adequate number of COs.



It is important to determine the methods of assessment. A comprehensive assessment strategy may be outlined using the revised Bloom's Taxonomy levels.

BLOOM'S TAXONOMY

CO – PO Mapping of Courses

After framing the CO statements, the COs framed for each Course is mapped with POs based on the relationship that exists between them. The COs which are not related to any of the POs is indicated with (-), signifying Nil. Measurement Mapping is based on Four Points Scale [High (H), Medium (M), Low (L) and Nil (-)]. For calculating weighted percentage of contribution of each Course in the attainment of the respective POs, the weights assigned for H, M and L are 3, 2and 1 respectively.

CO-PO/PSO Mapping Table (Course Articulation Matrix)

PO/PSOs / COs	PO1/ PSO1	PO2/ PSO2	PO3/ PSO3	PO4/ PSO4	PO5/ PSO5	PO6/ PSO6	PO7/ PSO7
CO1							
CO2							
CO3							
CO4							
CO5							

ELIGIBILITY FOR ADMISSION

Candidate should have passed the Higher Secondary Examination conducted by the Board of Higher Secondary Education, Tamil Nadu or any other examination accepted by Academic Council with Mathematics as one of the subjects.

DURATION OF THE PROGRAMME

The candidates shall undergo the prescribed course of study for a period of three academic years (six semesters).

MEDIUM OF INSTRUCTION

English

COURSES OFFERED

Part I	:	Tamil/Hindi Course
Part II	:	English
Part III	:	Core Courses
		Elective Courses • Generic Elective Courses • Discipline Specific Elective Courses
		Self Study Course - online
Part IV	:	Skill Enhancement Courses (SEC)
		Elective Course (NMEC)
		Environmental Studies Value Education
		Field Project/Internship
		Self Study Course - online
Part V	:	National Service Scheme/ Physical Education/ Youth Red Cross Society/ Red Ribbon Club/ Science Forum/ Eco Club/ Library and Information Science/ Consumer Club/ Health and Fitness Club/ National Cadet Corps/ Rotaract Club

B.2 EVALUATION SCHEME

B.2.1. PART II

Components	Internal Assessment Marks	Summative Examination Marks	Total Marks
Theory	15	60	100
Practical	5	15	
Assignment	5	-	

Three Periodic Tests - Average of the best two will be considered

B.2.2. Part I & PART III - Core Courses, Elective Courses (Generic, DSEC)

Components	Internal Assessment Marks	External Examination Marks	Total Marks
Theory	25	75	**100**

INTERNAL ASSESSMENT
Distribution of Marks
Theory

Mode of Evaluation			Marks
Periodic Test		:	15
Assignment	K3 Level	:	5
Quiz	K1 Level	:	5
Total		**:**	**25**

Three Periodic Tests - Average of the best two will be considered

Two Assignments - Better of the two will be considered

Three Quiz Tests - Best of the three will be considered

Practical

Mode of Evaluation		Marks
Practical Test*	:	30
Record & Performance	:	10
Total	**:**	**40**

*Average of the two Practical Tests will be considered

Question Pattern for Internal Tests **Duration: 2 Hours**

Section	Q.No.	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A	1 - 4	Multiple Choice	4	4	1	4
B	5 -6	Internal Choice - Either … or Type	3	3	7	21
C	8 -9	Internal Choice - Either… or Type	2	2	10	20
					Total	**45***

*The total marks obtained in the Periodic Test will be calculated for 15 marks

SUMMATIVE EXAMINATION
Question Pattern **Duration: 3 Hours**

Section	Q. No.	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A	1 -10	Multiple Choice	10	10	1	10
B	11 - 15	Internal Choice – Either …or Type	5	5	7	35
C	16 - 18	Internal Choice –Either… or Type	3	3	10	30
					Total	**75**

PROJECT

Assessment by Internal Examiner Only

Internal Assessment

Distribution of Marks

Mode of Evaluation	:	Marks
Project work and Report	:	60
Presentation and Viva –Voce	:	40
Total	**:**	**100**

B.2.3 PART IV - Skill Enhancement Courses, Non Major Elective Courses and Foundation Course

B.2.3.1 FOUNDATATION COURSE

INTERNAL ASSESSMENT
Distribution of Marks
Theory

Mode of Evaluation			**Marks**
Periodic Test		:	15
Assignment	K2 Level	:	5
Quiz	K1 Level	:	5
Total		**:**	**25**

Three Periodic Tests - Average of the best two will be considered
Two Assignments - Better of the two will be considered
Three Quiz Tests - Best of the three will be considered

Question Pattern for Periodic Tests **Duration: 1 Hour**

Section	**Q.No.**	**Types of Question**	**No. of Questions**	**No. of Questions to be answered**	**Marks for each Question**	**Total Marks**
A	1 - 3	Internal Choice Either …or Type	3	3	5	15
B	4	Internal Choice – Either …or Type	1	1	10	10
	Total					**25***

*The total marks obtained in the Periodic Test will be calculated for 15 marks

SUMMATIVE EXAMINATION

Mode of Evaluation		**Marks**
Summative Examination	:	50
Online Quiz (Multiple Choice Questions - K2 Level)	:	25
Total	**:**	**75**

Question Pattern **Duration: 2 Hours**

Section	**Q.No.**	**Types of Question**	**No. of Questions**	**No. of Questions to be answered**	**Marks for each Question**	**Total Marks**
A	1 - 5	Internal Choice - Either … or Type	5	5	6	30
B	6 - 7	Internal Choice – Either… or Type	2	2	10	20
	Total					**50**

B.2.3.2 Skill Enhancement Course - Entrepreneurial skills

INTERNAL ASSESSMENT ONLY
Distribution of Marks

Mode of Evaluation		**Marks**
Periodic Test	:	15
Assignment	:	5
Quiz	:	5
Model Examinations	:	60
Online Quiz(Multiple Choice Questions - K2 Level)	:	15
Total	**:**	**100**

Question Pattern for Periodic Tests **Duration: 1 Hour**

Section	**Types of Question**	**No. of Questions**	**No. of Questions to be answered**	**Marks for each Question**	**Total Marks**
A Q. No.(1- 3)	Internal Choice – Either Or Type	3	3	6	18
B Q. No.(4)	Internal Choice – Either Or Type	1	1	12	12
Total					**30**

*The total marks obtained in the Periodic Test will be calculated for 15 marks

Two Periodic Tests - Better of the two will be considered

Two Assignments - Better of the two will be considered

Two Quiz Tests - Better of the two will be considered

Question Pattern for Model Examination **Duration: 2 Hours**

Section	**Types of Question**	**No. of Questions**	**No. of Questions to be answered**	**Marks for each Question**	**Total Marks**
A Q. No.(1-5)	Internal Choice – Either Or Type	5	5	6	30
B Q. No.(6- 8)	Internal Choice – Either Or Type	3	3	10	30
Total					**60**

B.2.3.3 Skill Enhancement Courses/ Non Major Elective Courses

INTERNAL ASSESSMENT

Distribution of Marks

Theory

Mode of Evaluation			**Marks**
Periodic Test		:	15
Assignment	K3 Level	:	5
Quiz	K2 Level	:	5
Total		**:**	**25**

Three Periodic Tests - Average of the best two will be considered
Two Assignments - Better of the two will be considered
Three Quiz Tests - Best of the three will be considered

Question Pattern for Periodic Tests **Duration: 1 Hour**

Section	**Q.No.**	**Types of Question**	**No. of Questions**	**No. of Questions to be answered**	**Marks for each Question**	**Total Marks**
A	1 - 3	Internal Choice - Either …or Type	3	3	5	15
B	4	Internal Choice – Either …or Type	1	1	10	10
	Total					**25***

*The total marks obtained in the Periodic Test will be calculated for 15 marks

SUMMATIVE EXAMINATION

Mode of Evaluation		**Marks**
Summative Examination	:	50
Online Quiz (Multiple Choice Questions - K2 Level)	:	25
Total	**:**	**75**

Question Pattern **Duration: 2 Hours**

Section	**Q.No.**	**Types of Question**	**No. of Questions**	**No. of Questions to be answered**	**Marks for each Question**	**Total Marks**
A	1 - 5	Internal Choice - Either … or Type	5	5	6	30
B	6 - 7	Internal Choice – Either… or Type	2	2	10	20
	Total					**50**

B.2.4 PART IV- ENVIRONMENTAL STUDIES / VALUE EDUCATION

INTERNAL ASSESSMENT ONLY

Evaluation Pattern

Mode of Evaluation		**Marks**
Periodic Test	:	15
Assignment - K3 Level	:	10
Online Quiz (Multiple Choice Questions - K2 Level)	:	25
Poster Presentation - K3 Level	:	10
Report - K3 Level	:	10
Model Examination	:	30
Total	**:**	**100**

Three Assignment - Best of the three will be considered

Question Pattern for Periodic Tests **Duration: 1 Hour**

Section	**Types of Question**	**No. of Questions**	**No. of Questions to be answered**	**Marks for each Question**	**Total Marks**
A Q. No.(1- 3)	Internal Choice – Either Or Type	3	3	6	18
B Q. No.(4)	Internal Choice – Either Or Type	1	1	12	12
Total					**30***

Two Periodic tests - Better of the two will be considered

The total marks obtained in the Periodic test will be calculated for 15 marks

Question Pattern for Model Examination **Duration: 2 ½ Hours**

Section	**Q.No.**	**Types of Question**	**No. of Questions**	**No. of Questions to be answered**	**Marks for each Question**	**Total Marks**
A	1 - 5	Internal Choice - Either … or Type	5	5	6	30
B	6 - 8	Internal Choice – Either… or Type	3	3	10	30
	Total					**60***

*The total marks obtained in the Model Examination will be calculated for 30 marks

B. 2. 5 PART IV- Internship / Industrial Training

- Internship / Industrial Training is mandatory for all the Students
- **Internship:** Students have to involve in a designated activity, working in an organization under the guidance of an identified mentor for a period of 15 days.
- **Industrial Training:** Student has to undertake in-plant training in industries individually or in group for a period of 15 days.
- Internship / Industrial Training must be done during the fourth semester holidays
- **Internal Assessment only.**

Mode of Evaluation		Marks
Onsite Learning/Survey	:	50
Report	:	25
Viva-Voce	:	25
Total		**100**

B.2.6 SELF STUDY COURSE

B.2.6.1 PART III – Discipline Specific Quiz – Online

- Assessment by Internal Examiner only
- Question Bank is prepared by the Faculty Members of the Departments for all the Core and Elective Courses offered in all the Semesters.
- No. of Questions to be taken 700.
- Multiple Choice Question pattern is followed.
- Online Test will be conducted in VI Semester for 100 Marks.
- Model Examination is conducted after two periodic tests.

Distribution of Marks

Mode of Evaluation		Marks
Periodic Test	:	25
Model Examination	:	75
	:	**100**

Two Periodic Tests - Better of the two will be considered

B.2.6 .2 PART IV - Practice for Competitive Examinations – Online

Assessment by Internal Examiner only

- Question Bank prepared by the Faculty Members of the respective Departments will be followed.
- Multiple Choice Question pattern is followed.
- Online Test will be conducted in V Semester for 100 Marks.
- Model Examination is conducted after two periodic tests.

Subject wise Allotment of Marks

Subject		Marks
Tamil	:	10
English	:	10
History	:	10
Mathematics	:	10
Current affairs	:	10
Commerce, Law & Economics	:	10
Physical Sciences	:	10
Life Sciences	:	15
Computer Science	:	5
Food and Nutrition	:	5
Sports and Games	:	5
Total	**:**	**100**

Distribution of Marks

Mode of Evaluation		Marks
Periodic Test	:	25
Model Examination	:	75
Total	**:**	**100**

Two Periodic Tests - Better of the two will be considered

B.2.7. Part V – Extension Activities

INTERNAL ASSESSMENT ONLY

Distribution of Marks

Mode of Evaluation		Marks
Attendance	:	5
Performance	:	10
Report/Assignment/Project/Camp/Practical	:	10
Total	**:**	**25***

*The marks obtained will be calculated for 100 marks

B.2.8 EXTRA CREDIT COURSES (OPTIONAL)

2.8.1 Extra Credit Course offered by the Department.

Assessment by Internal Examiner Only (To be conducted along with the III Periodic Test)

Distribution of Marks

Mode of Evaluation		Marks
Quiz (Multiple Choice Questions)	:	25
Model Examination	:	75
Total	**:**	**100**

Question Pattern for Model Examination

Section	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A Q.No.(1-5)	Internal Choice-Either or Type	5	5	7	35
B Q.No.(6-9)	Internal Choice-Either or Type	4	4	10	40
				Total	**75**

2.8.2 Extra credit Course offered by MOOC (Massive Open Online Course)

- The Courses shall be completed within the first V Semesters of the Programme.
- The allotment of credits is as follows **(Maximum of 10 credits)**

4weeks Course - 1 credit

8 weeks Course - 2 credits

12 weeks Course - 3 credits

ELIGIBILITY FOR THE DEGREE

- The candidate will not be eligible for the Degree without completing the prescribed Courses of study, lab work, *etc*., and a minimum Pass marks in all the Courses.
  - No Pass minimum for Internal Assessment.
  - Pass minimum for External Examination is 27 marks out of 75 marks for Core Courses, Elective Courses (Generic Elective, DSEC Courses)
  - Pass minimum for External Examination is 18 marks out of 50 marks for Skill Enhancement Courses and Non Major Elective Courses (NMEC).
  - The aggregate minimum pass percentage is 40.
  - Pass minimum for External Practical Examination is 21 marks out of 60 marks.

ATTENDANCE

(a) The students who have attended the classes for 76 days (85%) and above are permitted to appear for the Summative Examinations without any condition.

(b) The students who have only 60-75 days (66% - 84%) of attendance are permitted to appear for the Summative Examinations after paying the required fine amount and fulfilling other conditions according to the respective cases.

(c) The students who have attended the classes for 59 days and less - upto 45 days (50%-65%) can appear for the Summative Examinations only after getting special permission from the Principal.

(d) The students who have attended the classes for 44 days or less (50%) cannot appear for the Summative Examinations and have to repeat the whole semester.

- For Part V in UG Programmes, the students require 75 % of attendance to get a credit.
- For Certificate, Diploma, Advanced Diploma and Post Graduate Diploma Programmes, the students require 75% of attendance to appear for the Theory/Practical Examinations.

B.3 ASSESSMENT MANAGEMENT PLAN

An Assessment Management Plan that details the assessment strategy both at the Programme and the Course levels is prepared. The continuous assessment is implemented using an assessment rubric to interpret and grade students.

B.3.1 Assessment Process for CO Attainment

Assessment is one or more processes carried out by the institution that identify, collect and prepare data to evaluate the achievement of Course Outcomes and Programme Outcomes. Course Outcome is evaluated based on the performance of students in the Continuous Internal Assessments and in End Semester Examination of a Course. Target levels of attainment shall be fixed by the Course teacher and Heads of the respective departments.

Direct Assessment (rubric based)-Conventional assessment tools such as Term Test, Assignment, Quiz and End Semester Summative Examination are used.

Indirect Assessment – Done through Course Exit Survey.

CO Assessment Rubrics

For the evaluation and assessment of COs and POs, rubrics are used. Internal assessment contributes 40% and End Semester assessment contributes 60% to the total attainment of a CO for the theory Courses. For the practical Courses, internal assessment contributes 50% and Semester assessment contributes 50% to the total attainment of a CO. Once the Course Outcome is measured, the PO can be measured using a CO-PO matrix.

CO Attainment

Direct CO Attainment

Course outcomes of all Courses are assessed and the CO – wise marks obtained by all the students are recorded for all the assessment tools. The respective CO attainment level is evaluated based on set attainment rubrics.

Target Setting for Assessment Method

For setting up the target of internal assessment tools, 55% of the maximum mark is fixed as target. For setting up the target of End Semester Examination, the average mark of the class shall be set as target.

Formula for Attainment for each CO

Attainment = Percentage of students who have scored more than the target marks

$$\text{Percentage of Attainment} = \frac{\text{Number of Students who Scored more than the Target}}{\text{Total Number of Students}} \times 100$$

Attainment Levels of COs

Assessment Methods	**Attainment Levels**	
Internal Assessment	Level 1	50% of students scoring more than set target marks in Internal Assessment tools
	Level 2	55% of students scoring more than set target marks in Internal Assessment tools
	Level 3	60% of students scoring more than set target marks in internal Assessment tools
End Semester Summative Examination	Level 1	50% of students scoring more than average marks in End Semester Summative Examination
	Level 2	55% of students scoring more than average marks in End Semester Summative Examination
	Level 3	60% of students scoring more than average marks in End Semester Summative Examination

Indirect CO Attainment

At the end of each Course, an exit survey is conducted to collect the opinion of the students on attainment of Course Outcomes. A questionnaire is designed to reflect the views of the students about the Course outcomes.

Overall CO Attainment= 75% of Direct CO Attainment + 25 % of Indirect CO Attainment

In each Course, the level of attainment of each CO is compared with the predefined targets. If the target is not reached, the Course teacher takes necessary steps for the improvement to reach the target.

For continuous improvement, if the target is reached, the Course teacher can set the target as a value greater than the CO attainment of the previous year.

B.3.2 Assessment Process for Overall PO Attainment

With the help of CO - PO mapping, the PO attainment is calculated. PO assessment is done by giving 75% weightage to direct assessment and 25% weightage to indirect assessment. Direct assessment is based on CO attainment, where 75% weightage is given to attainment through End Semester Examination and 25% weightage is given to attainment through

Internal assessments. Indirect assessment is done through Graduate Exit Survey and participation of students in Co-curricular/Extra-curricular activities.

PO Assessment Tools

Mode of Assessment	**Assessment Tool**	**Description**
Direct Attainment (Weightage -75%)	CO Assessment	This is computed from the calculated CO Attainment value for each Course
Indirect Attainment (Weightage - 25%)	Graduate Exit Survey 10%	At the end of the Programme, Graduate Exit Survey is collected from the students and it gives the opinion of the students on attainment of Programme Outcomes
	Co-curricular / Extracurricular activities 15%	For participation in Co-curricular / Extracurricular activities during the period of their study.

Programme Articulation Matrix (PAM)

Course Code	**Course Title**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
Average Direct PO Attainment									
Direct PO Attainment in percentage									

Indirect Attainment of POs for all Courses

POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
Graduate Exit Survey								
Indirect PO Attainment								

Attainments of POs for all Courses

POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
Direct Attainment **(**Weightage - 75%)								
Indirect Attainment (Weightage - 25%)								
Overall PO Attainment								

Overall PO Attainment= 75% of Direct PO Attainment +
25% of Indirect PO Attainment (Graduate Exit Survey & Participation in Co- curricular and Extracurricular Activities)

Expected Level of Attainment for each of the Programme Outcomes

POs	Level of Attainment
Attainment Value ≥70%	Excellent
60% ≤ Attainment Value < 70%	Very Good
50% ≤ Attainment Value < 60%	Good
40% ≤ Attainment Value < 50%	Satisfactory
Attainment Value <40%	Not Satisfactory

Level of PO attainment

Graduation Batch	Overall PO Attainment (in percentage)	Whether Expected Level of PO is Achieved? (Yes/No)

B.3.3 Assessment Process for PEOs

The curriculum is designed so that all the courses contribute to the achievement of PEOs. The attainment of PEOs is measured after 5 years of completion of the programme only through Indirect methods.

Target for PEO Attainment

Assessment Criteria	Target (UG)	Target (PG)
Record of Employment	15% of the class strength	30% of the class strength
Progression to Higher Education	50% of the class strength	5% of the class strength
Record of Entrepreneurship	2% of the class strength	5% of the class strength

Attainment of PEOs

Assessment Criteria & Tool	**Weightage**
Record of Employment	10
Progression to Higher Education	20
Record of Entrepreneurship	10
Feedback from Alumnae	30
Feedback from Parents	10
Feedback from Employers	20
Total Attainment	**100**

$$\text{Percentage of PEO Attainment from Employment} = \frac{\text{Number of Students who have got Employment}}{\text{Target}} \times 100$$

$$\text{Percentage of PEO Attainment from Higher Education} = \frac{\text{Number of Students who pursue Higher Education}}{\text{Target}} \times 100$$

$$\text{Percentage of PEO Attainment from Entrepreneurship} = \frac{\text{Number of Students who have become Entrepreneurs}}{\text{Target}} \times 100$$

Expected Level of Attainment for each of the Programme Educational Objectives

POs	**Level of Attainment**
Attainment Value ≥70%	Excellent
60% ≤ Attainment Value < 70%	Very Good
50% ≤ Attainment Value < 60%	Good
40% ≤ Attainment Value < 50%	Satisfactory
Attainment Value <40%	Not Satisfactory

Level of PEO Attainment

Graduation Batch	**Overall PEO Attainment (in percentage)**	**Whether Expected Level of PEO is Achieved? (Yes/No)**

C. PROCESS OF REDEFINING THE PROGRAMME EDUCATIONAL OBJECTIVES

The College has always been involving the key stake holders in collecting information and suggestions with regard to curriculum development and curriculum revision. Based on the information collected the objectives of the Programme are defined, refined and are inscribed in the form of PEOs. The level of attainment of PEOs defined earlier will be analysed and will identify the need for redefining PEOs. Based on identified changes in terms of curriculum, regulations and PEOs, the administrative system like Board of Studies, Academic Council and Governing Body may recommend appropriate actions. As per the Outcome Based Education Framework implemented from the Academic Year 2020 -2021, the following are the Programme Structure, the Programme Contents and the Course Contents of B.Sc. Information Technology .Programme.

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BACHELOR OF SCIENCE

INFORMATION TECHNOLOGY (2025)

Outcome Based Education with Choice Based Credit System

Programme Structure - Allotment of Hours and Credits

For those who join in the Academic Year 2023-2024

Components	Semester						Total Number of Hours (Credits)
	I	II	III	IV	V	VI	
Part I : Tamil /Hindi	6 (3)	6 (3)	6 (3)	6 (3)	-	-	24 (12)
Part II : English	6 (3)	6(3)	6 (3)	6 (3)	-	-	24 (12)
Part III : Core Courses, Elective Courses & Self Study Course							
Core Course	5 (5)	5 (5)	5 (5)	5 (5)	6 (6)	6 (5)	32 (31)
Core Course	-	-	-	-	6 (6)	6 (5)	12 (11)
Core Course	-	-	-	-	-	-	
Core Course Practical	5(3)	5(3)	5(3)	4 (3)	5 (3)	6 (3)	30 (18)
Core Course Project	-	-	-	-	1 (1)	-	1 (1)
Elective Course (DSEC)	-	-	-	-	5 (4)	5 (4)	10 (8)
Elective Course (DSEC Practical)	-	-	-	-	5 (3)	5 (3)	10 (6)
Elective Course I (Allied)	4 (4)	4 (4)	4 (4)	4 (4)	-	-	16 (16)
Elective Course I Practical I (Allied)	-	-	-	-	-	-	-
Elective Course II (Allied)	-	-	-	-	-	-	-
Elective Course II Practical II(Allied)	-	-	-	-	-	-	-
Self Study Course	-	-	-	-	-	0 (1)	0 (1)
Part IV: Skill Enhancement Courses, Elective Courses, Self Study Course & Internship / Industrial Training							
SEC	2 (2)	-	1 (1)	2 (2)	-	-	5 (5)
SEC	-	2 (2)	2 (2)	2 (2)	-	2 (2)	8 (8)
Elective Course(NME)	2 (2)	2 (2)	-	-	-	-	4 (4)
Value Education	-	-	-	-	2 (2)	-	2 (2)
Environmental Studies	-	-	1 (0)	1 (2)	-	-	2 (2)
Self Study Course	-	-	-	-	0 (1)	-	0 (1
Internship / Industrial Training	-	-	-	-	0 (1)	-	0 (1)
Part V: Extension Activities	-	-	-	-	-	0 (1)	0 (1)
Total	**30 (22)**	**30 (22)**	**30(21)**	**30 (24)**	**30 (27)**	**30(24)**	**180 (140)**
Extra Credit Course (Self Study Course)	-	-	-	-	0(2)	-	0(2)

DSEC: Discipline Specific Elective Course SEC: Skill Enhancement Course

B.SC. INFORMATION TECHNOLOGY

Semester V

Sl. No.	Component		Title of the Course	Course Code	Hours per week	Credits	Exam. Hours	Marks		
								Int.	Ext.	Total
1.	Part III	Core Course 9	Python Programming	23UITC51	6	6	3	25	75	100
2.		Core Course – 10	Operating Systems	23UITC52	6	6	3	25	75	100
3.		Core Course – 11 Practical-V	Python Programming Practical	23UITC51P	5	3	3	40	60	100
4.		Core Course-12 Project	Project	23UITC53PR	1	1	-	100	-	100
5.		Discipline Specific Elective Course 1 (DSEC 1)	Big Data Analytics/ Fuzzy Logic	23UITE51/ 23UITE52	5	4	3	25	75	100
6.		Discipline Specific Elective Course 2 Practical (DSEC 2)	Big Data Analytics using R Practical / Fuzzy Logic Practical	23UITE53P/ 23UITE54P	5	3	3	40	60	100
7.	Part IV		Value Education	23UGVE51	2	2	2	100	-	100
8.		Self-Study Course	Practice for Competitive Examination - Online	23UGCE51	-	1	-	100	-	100
9.		Internship / Industrial Training	Internship	23UITI51	-	1	-	100	-	100
	TOTAL				**30**	**27**				**900**

Extra Credit Course (Self Study Course)	Computer Organization	23UITO51	-	2	3	100	-	100

B.SC. INFORMATION TECHNOLOGY

Semester VI

Sl. No.	Component		Title of the Course	Course Code	Hours per week	Credits	Exam. Hours	Marks		
								Int.	Ext.	Total
1.	Part III	Core Course 13	Data Mining	23UITC61	6	5	3	25	75	100
2.		Core Course – 14	Data Communication and Networking	23UITC62	6	5	3	25	75	100
3.		Core Course – 15 Practical-VI	PHP Scripting Practical	23UITC61P	6	3	3	40	60	100
4.		Discipline Specific Elective Course 3 (DSEC 3)	Artificial Intelligence/ Natural Language Processing	23UITE61/ 23UITE62	5	4	3	25	75	100
5.		Discipline Specific Elective Course 4 Practical (DSEC 4)	Machine Learning using AI Practical/ Deep Learning Practical	23UITE63P/ 23UITE64P	5	3	3	40	60	100
6.	Part IV	Self-Study Course	Discipline Specific Quiz - Online	23UITQ61	-	1	-	100	-	100
7.		SEC – 7 Practical 2	Multimedia Practical	23UITS61P	2	2	2	40	60	100
8.	Part V		Extension Activities		-	1	-	100	-	100
				TOTAL	**30**	**24**				**800**

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B.SC. INFORMATION TECHNOLOGY – 2025
(for those who join in 2023 – 2024)

Semester V	**PYTHON PROGRAMMING**	Hours/Week: 6	
Core Course 9		Credits: 6	
Course Code **23UITC51**		Internal 25	External 75

COURSE OUTCOMES:
On completion of the course, the students will be able to

CO1 : learn the fundamental elements of concepts in python language. [K1]

CO2 : interpret different looping and conditional statements in python language. [K2]

CO3 : demonstrate the various data types and identify the usage of control statements, loops, functions and Modules in python for processing the data [K2]

CO4 : apply and solve problems using basic constructs and techniques of python. [K3]

CO5 : develop the approaches used in the development of interactive application. [K3]

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. (15 Hours)

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. (15 Hours)

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. (20 Hours)

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. (20 Hours)

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. (20 Hours)

TEXT BOOKS

1. Reema Thareja (2017), *Python Programming using problem solving approach*, First Edition, Oxford University Press.

2. Dr. R. Nageswara Rao (2017), *Core Python Programming*, First Edition, Dream tech Publishers

REFERENCE BOOKS

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

Web Resources

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

Course Code 23UITC51	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1. a.	PSO 1. b.	PSO 2. a.	PSO 2. b.	PSO3	PSO4	PSO 5.a.	PSO 5. b.	PSO6	PSO7
CO 1	3	2	1	3	2	1	2	3	3	1
CO 2	3	3	1	2	2	1	3	2	1	1
CO 3	3	3	1	1	3	2	3	3	3	1
CO 4	3	3	2	3	3	2	2	3	2	1
CO 5	3	3	1	3	3	2	3	2	2	1

Strong (3) Medium (2) Low (1)

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Head of the Department

Dr.D.Shunmuga Kumari
Course Designer

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B.SC. INFORMATION TECHNOLOGY – 2025
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Semester V	**OPERATING SYSTEMS**	Hours/Week: 6	
Core Course 10		Credits: 6	
Course Code **23UITC52**		Internal 25	External 75

COURSE OUTCOMES:

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

CO1: reminisce the structure of operating system, files, services and techniques used for scheduling CPU helps in synchronizing the process and memory. [K1]

CO2: illustrate the components of a system, main principles and techniques used to implement processes and deadlock as well as the different algorithms for process scheduling and paging of memory to solve the technical memory management errors. [K2]

CO3: outline the main problems related to scheduling and the different process synchronization and also deadlock mechanisms, as well as describe the different approaches of memory management and paging replacement algorithms to resolve page faults. [K2]

CO4: apply the knowledge of process management, synchronization, deadlock to solve basic problems in allocating memory and resource. [K3]

CO5: organize the basic system design process to schedule the process and CPU as well as the requirement for process coordination and avoid the deadlock to enhance the system capacitance. [K3]

UNIT I

Introduction: Definition of Operating System.

OS Structures: OS Services - System Calls.

Process Management: Process Concept - Process Scheduling - Operation on Processes - Operations on Processes - Inter-process Communication. (15 Hours)

UNIT II

CPU Scheduling: Basic Concepts - Scheduling Criteria - Scheduling Algorithms.

Process Synchronization: The Critical Section Problem - Semaphores - Classical Problems of Synchronization. (20 Hours)

UNIT III

Deadlocks: System Model - Deadlock characterization – Methods for Handling Deadlocks Deadlock Prevention - Deadlock avoidance- Deadlock Detection - Recovery from Deadlock. (20 Hours)

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. (20 Hours)

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. (15 Hours)

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 BOOKS

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.

WEB RESOURCES

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 Code 23UITC52	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1. a.	PSO 1. b.	PSO 2. a.	PSO 2. b.	PSO3	PSO4	PSO 5.a.	PSO 5. b.	PSO 6	PSO 7
CO1	3	3	-	3	2	2	3	2	3	-
CO2	3	2	2	2	2	2	3	3	2	-
CO3	3	2	3	2	2	2	2	3	-	-
CO4	3	3	3	3	3	2	3	3	3	-
CO5	2	3	2	3	3	3	3	3	3	-

Strong (3) Medium (2) 1ow (1)

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Semester V	**PYTHON PROGRAMMING PRACTICAL**	Hours/Week: 5	
Core Course 11 Practical V		Credits: 3	
Course Code **23UITC51P**		Internal 40	External 60

COURSE OUTCOMES:
On completion of the course, the students will be able to

CO1 : categorize the fundamental programming elements in python language. [K2]

CO2 : demonstrate the different looping and conditional statements in python language. [K2]

CO3 : Makeuse of the various data types ,control statements, loops, functions and Modules to develop the python program for processing the data [K3]

CO4 : apply and solve problems using basic constructs and techniques of python. [K3]

CO5 : develop the approaches used in the development of interactive application. [K3]

Exercises

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 Code 23UITC51P	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1. a.	PSO 1. b.	PSO 2. a.	PSO 2. b.	PSO3	PSO4	PSO 5.a.	PSO 5. b.	PSO 6	PSO 7
CO1	3	3	-	3	2	2	3	2	3	1
CO2	3	2	2	2	2	2	3	3	1	1
CO3	3	2	3	2	2	2	2	3	3	1
CO4	3	3	3	3	3	2	3	3	2	1
CO5	2	3	2	3	3	3	3	3	2	1

Strong (3) Medium (2) Low (1)

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B.SC. INFORMATION TECHNOLOGY – 2025
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Semester V	**PROJECT**	Hours/Week: 1
Core Course 12 Project		Credits: 1
Course Code **23UITC53PR**		Internal 100

COURSE OUTCOMES

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

CO1: apply fundamental concepts and methods to identify and solve technical problems. [K2]

CO2: discuss the ability to look into industrial problem and implement a secure and reliable information system. [K2]

CO3: identify the characteristics of various stages of projects to provide technology based conclusion. [K3]

CO4: organize team management to complete the project on time and work effectively as a member or a leader of a team. [K3]

CO5: identify the software development process models to present technical report for Lifelong learning. [K3]

Students are expected to select a project in the field of Information Technology and related interdisciplinary fields. Two students can do one project. Minimum pages for project report should be 20 pages. Two typed copies of the report on the completed project will be submitted to the Controller of Examination through the Head of the department in the month of November during V semester. Evaluation will be done internally.

Project work & Report - 60 marks

Presentation & Viva-voce - 40 marks

Course Code 23UITC53PR	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1. a.	PSO 1. b.	PSO 2. a.	PSO 2. b.	PSO3	PSO4	PSO 5.a.	PSO 5. b.	PSO 6	PSO 7
CO1	3	3	3	3	2	2	3	2	3	1
CO2	3	2	2	2	2	2	3	3	3	1
CO3	3	2	3	2	2	2	2	3	3	1
CO4	3	3	3	3	3	2	3	3	2	1
CO5	2	3	2	3	3	3	3	3	2	1

Strong (3) Medium (2) Low (1)

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Semester V	**BIG DATA ANALYTICS**	Hours/Week: 5	
DSEC 1		Credits: 4	
Course Code **23UITE51**		Internal 25	External 75

COURSE OUTCOME:

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

CO1: list the characteristics of big data, algorithms and methods used for clustering to acquire the basic knowledge of big data computing.[K1]

CO2: Demonstrate specialist knowledge of how a range of data sources , analytical methods and streams are used to manipulate data stores across multiple domains.[K2]

CO3: Summarize the strengths and limitations of a range of data analytics approaches that helps in applying real time data analytics projects. [K2]

CO4: identify the use of decision tree algorithms, stream data models and Hbase tools to manipulate data and perform statistical analysis.[K3]

CO5: Apply contemporary data analytics research techniques to investigate social, policy, scientific and organisational problems through software to carry out societal IT projects. [K3]

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. (15 Hours)

UNIT II

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. (15 Hours)

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. (15 Hours)

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

(15 Hours)

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.

(15 Hours)

TEXT BOOK

Anand Rajaraman and Jeffrey David Ullman (2012), *Mining of Massive Datasets*, Cambridge University Press.

REFERENCE BOOKS

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

WEB RESOURCES

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

Course Code 23UITE51	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1. a.	PSO 1. b.	PSO 2. a.	PSO 2. b.	PSO3	PSO4	PSO 5.a.	PSO 5. b.	PSO 6	PSO 7
CO1	3	3	1	3	2	2	3	2	1	1
CO2	3	2	2	2	2	2	3	3	1	1
CO3	3	2	3	2	2	2	2	3	1	1
CO4	3	3	3	3	3	2	3	3	1	1
CO5	2	3	2	3	3	3	3	3	1	1

Strong (3) Medium (2) Low (1)

Dr. A.Bharathi Lakshmi
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Quality Education with Wisdom and Values

B.Sc. INFORMATION TECHNOLOGY
(for those who join in 2023 – 2024)

Semester V	**FUZZY LOGIC**	Hours/Week: 5	
DSEC 1		Credits: 4	
Course Code **23UITE52**		Internal 25	External 75

COURSE OUTCOMES

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

CO1: understand the basics of Fuzzy sets, operation and properties. [K1]

CO2: explain the concept of Cartesian product and composition on Fuzzy relations and use the tolerance and Equivalence relations. [K2]

CO3: discuss the various fuzzification methods and features of membership Functions. [K2]

CO4: solve the problems based on Fuzzy Rule-Based System and defuzzification methods occurred in real time applications. [K3]

CO5: apply the concepts of Fuzzy Logic and Design in automotive applications. [K3]

UNIT I

Introduction: 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. (15 Hours)

UNIT II

Classical and Fuzzy Relations: Operations on Crisp Relation-Properties of Crisp Relations-Composition. **:** Cardinality of Fuzzy Relations-Operations on Fuzzy Relations-Properties of Fuzzy Relations-Fuzzy Cartesian product and Composition. **Tolerance and Equivalence Relations:** Crisp Relation. (15 Hours)

UNIT III

Membership Functions: Introduction, Features of Membership Function, Classification of Fuzzy Sets, Fuzzification, Membership Value Assignments, Intuition, Inference, Rank Ordering. (15 Hours)

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.

(15 Hours)

UNIT V

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

(15 Hours)

TEXT BOOK

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

REFERENCE BOOKS

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

Web Resources

1. https://www.javatpoint.com/fuzzy-logic
2. https://www.guru99.com/what-is-fuzzy-logic.html

Course Code 23UITE52	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1. a.	PSO 1. b.	PSO 2. a.	PSO 2. b.	PSO3	PSO4	PSO 5.a.	PSO 5. b.	PSO 6	PSO 7
CO1	3	3	1	3	2	2	3	2	2	1
CO2	3	2	2	2	2	2	3	3	2	1
CO3	3	2	3	2	2	2	2	3	2	1
CO4	3	3	3	3	3	2	3	3	1	1
CO5	2	3	2	3	3	3	3	3	2	1

Strong (3) Medium (2) Low (1)

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B.Sc. INFORMATION TECHNOLOGY

(for those who join in 2023 – 2024)

Semester V	**BIG DATA ANALYTICS USING R PRACTICAL**	Hours/Week: 5	
DSEC 2 Practical		Credits: 3	
Course Code **23UITE53P**		Internal 40	External 60

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

CO1: demonstrate the R language syntax including control statements, loops and functions to write programs for a wide variety of real world problems in mathematics and research field. [K2]

CO2: illustrate the control structures like looping and conditional statements in R to store, process and sort the data in easier manner. [K2]

CO3: make use of the concepts of arrays and vectors in R to implement sorting and searching problems to enhance their knowledge . [K3]

CO4: interpret the capabilities of R data expression for data verification and Recursion procedure for building performance efficient R programs.[K3]

CO5: identify the different packages in R language to manipulate the large set of data that will improve their lifelong learning.[K3]

Exercises

1. R Program to Add Two Vectors
2. Find Sum, Mean and Product of Vector in R Programming
3. R Program to Generate Random Number from Standard Distributions
4. R Program to Find Minimum and Maximum of n numbers
5. R Program to Sort a Vector
6. R Program to Find the Factorial of a Number
7. R Program to print Multiplication Table
8. R Program to Check Prime Number

9. R Program to check Armstrong Number
10. R Program to Print the Fibonacci Sequence
11. R Program to Check for Leap Year
12. Check if a Number is Odd or Even in R Programming
13. R Program to Check if a Number is Positive, Negative or Zero
14. R Program to Find the Sum of Natural Numbers
15. R program to Find the Factorial of a Number Using Recursion
16. R Program to Find the Factors of a Number using function
17. Fibonacci Sequence Using Recursion in R
18. R Program to Find H.C.F. or G.C.D.
19. R Program to Make a Simple Calculator
20. Sum of Natural Numbers Using Recursion
21. Data Manipulation with dplyr package
22. Data Manipulation with data.table package
23. Study and implementation of Data Visualization with ggplot2
24. Study and implementation data transpose operations in R.

Course Code 23UITE53P	**PO1**		**PO2**		**PO3**	**PO4**	**PO5**		**PO6**	**PO7**
	PSO 1. a.	**PSO 1. b.**	**PSO 2. a.**	**PSO 2. b.**	**PSO3**	**PSO4**	**PSO 5.a.**	**PSO 5. b.**	**PSO 6**	**PSO 7**
CO1	3	3	1	3	2	2	3	2	2	1
CO2	3	2	2	2	2	2	3	3	2	1
CO3	3	2	3	2	2	2	2	3	2	1
CO4	3	3	3	3	3	2	3	3	2	1
CO5	2	3	2	3	3	3	3	3	2	1

Strong (3) Medium (2) Low (1)

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B.Sc. INFORMATION TECHNOLOGY

(for those who join in 2023 – 2024)

Semester V	**FUZZY LOGIC PRACTICAL**	Hours/Week: 5	
DSEC 2 Practical		Credits: 3	
Course Code **23UITE54P**		Internal 40	External 60

Course Outcomes

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

CO1: understand and apply fuzzy logic concepts, design and implement fuzzy systems, defuzzification, and membership functions. [K2]

CO2: design and implement fuzzy controllers for simple control systems and simulate fuzzy systems using appropriate tools and techniques. [K2]

CO3: interpret the concepts of fuzzy logic to solve real-world problems in areas such as control, decision-making, and pattern recognition. [K3]

CO4: discover the performance of fuzzy systems using simulation and experimentation, various fuzzification methods and features of membership Functions. [K3]

CO5: evaluate the effectiveness of fuzzy logic solutions and identify potential improvements. [K3]

Lab Exercises

1. Python program to implement union operations on fuzzy set.
2. Python program to implement intersection operations on fuzzy set.
3. Python program to implement Complement operations on fuzzy set.
4. Python program to implement difference operations on fuzzy set.
5. Python program to apply De-Morgan's law on fuzzy set.
6. Python program to implement Fuzzy Relations (Max-min Composition)
7. Python program to implement Fuzzy Relations (Max-product Composition).
8. Python program to implement Triangular membership function on fuzzy logic.
9. Python program to implement Trapezoidal membership function on fuzzy logic
10. Python program to implement Sigmoid function on fuzzy logic
11. Python program to implement Generalized bell function on fuzzy logic

Course Code 23UITE54P	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1. a.	PSO 1. b.	PSO 2. a.	PSO 2. b.	PSO3	PSO4	PSO 5.a.	PSO 5. b.	PSO 6	PSO 7
CO1	3	3	1	3	2	2	3	2	2	1
CO2	3	2	2	2	2	2	3	3	2	1
CO3	3	2	3	2	2	2	2	3	2	1
CO4	3	3	3	3	3	2	3	3	2	1
CO5	2	3	2	3	3	3	3	3	2	1

Strong (3) Medium (2) Low (1)

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B.Sc. INFORMATION TECHNOLOGY (SEMESTER)

(for those who join in 2023 – 2024)

Semester V	**INTERNSHIP**	Hours/Week: -
Internship / Industrial Training		Credits: 1
Course Code **23UITI51**		Internal 100

COURSE OUTCOMES

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

CO1: observe, analyze, and understand organizational processes, systems, and cultures, and identify areas for further improvement. [K2]

CO2: apply theoretical concepts learned in the classroom to Industry based problems. [K3]

CO3: develop professional skills, including team communication and work, and time management, and adhere to organizational norms and etiquette. [K3]

CO4: build the industry ready graduates and lifelong learning. [K3]

CO5: analyse problem-solving and critical thinking skills by identifying and addressing organizational challenges and problems. [K4]

Guidelines/ Regulations:

- Each student must go for Internship training in a reputed Industry / Company / Organization/ Educational Institution.
- Students should produce the completion certificate after the completion of Internship period.
- A report of 10-15 pages must be submitted by each student after the completion of the Internship period.
- Internal Viva-voce examination will be conducted.
- Students with diverse disabilities must complete a 10 day internship programme at their preferred places.

Course Code 23UITI51	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	3	2	2	3	3	1
CO2	3	2	2	2	3	3	1
CO3	3	3	2	2	2	3	1
CO4	3	3	3	2	3	2	1
CO5	2	2	3	3	3	2	1

Strong (3) Medium (2) Low (1)

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B.Sc. INFORMATION TECHNOLOGY (SEMESTER)

(for those who join in 2023 – 2024)

Semester V	**COMPUTER ORGANIZATION**	Hours/Week: -
Extra Credit		Credits: 2
Course Code **23UITO51**		Internal 100

COURSE OUTCOMES

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

CO1: Learn and identify the main concepts, key technologies of computer organization and control memory functions to strong their foundation.

CO2: Recognize the architecture and infrastructure of Computer Registers, Parallel Processing and peripheral devices to design the real-time system.

CO3: explain the importance of computer arithmetic, pipelining, Direct Memory Access, design of control unit for data flow efficiency for the system.

CO4: develop the key aspects and evolution of Memory hierarchy to enhance their skill in current technical concepts and practices.

CO5: identify the challenges faced by the interrupts, Asynchronous Data Transfer, Instruction Formats and Addressing Modes that supports in lifelong learning.

UNIT I:

Basic Computer Organization and Design: Instruction codes – Computer Registers – Computer Instructions – Timing and Control – Instruction cycle – Memory Reference Instructions – Input / Output and Interrupt. **Microprogrammed Control:** Control Memory – Address Sequencing – Microprogram Example – Design of Control Unit.

UNIT II:

Central Processing Unit: Introduction – General Register Organization – Stack Organization – Instruction Formats – Addressing Modes – Data Transfer and Manipulation – Program Control.

UNIT III:

Pipeline and Vector Processing: Parallel Processing – Pipelining – Arithmetic Pipeline – Instruction pipeline. **Computer Arithmetic:** Introduction – Addition and Subtraction – Multiplication Algorithms.

UNIT IV:

Input / Output Organization: Peripheral Devices – Input/output Interface – Asynchronous Data Transfer – Priority Interrupt – Direct Memory Access (DMA).

UNIT V:

Memory Organization: Memory Hierarchy – Main Memory – Auxiliary memory – Associative Memory – cache Memory - Virtual Memory.

TEXT BOOK:

Computer System Architecture, M.Morris Mano, Third Edition, (Twelth Impression), PEARSON.

REFERENCE BOOKS:

1. Computer Organization and Architecture, William Stallings, Prentice Hall of India New Delhi, 2008.

2. Computer Organization, V.Carl Hamacher, Z.G. Vranesic, S G Zaky, McGraw Hill, Fifth Edition, 2005.

3. Hardware and Computer Organization**,** Arnold S. Berger,Fifth Edition,2005

Course Code 23UITO51	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1. a.	PSO 1. b.	PSO 2. a.	PSO 2. b.	PSO3	PSO4	PSO 5.a.	PSO 5. b.	PSO 6	PSO 7
CO1	3	3	1	2	2	2	3	2	1	1
CO2	3	2	2	2	2	2	3	3	2	1
CO3	3	2	3	2	2	2	2	3	2	1
CO4	3	3	3	1	3	2	3	3	2	1
CO5	2	3	2	1	3	3	3	3	2	1

Strong (3) Medium (2) Low (1)

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B.SC. INFORMATION TECHNOLOGY – 2025
(for those who join in 2023 – 2024)

Semester VI	**DATA MINING**	Hours/Week: 6	
Core Course 13		Credits: 5	
Course Code **23UITC61**		Internal 25	External 75

COURSE OUTCOMES:
On completion of the course, the students will be able to

CO1: relate the real time datasets for data analysis. [K1]

CO2: demonstrate data-mining techniques based on the different applications. [K2]

CO3: explain appropriate data models for data mining techniques to solve real world problems. [K2]

CO4: apply suitable preprocessing for data mining task. [K3]

CO5: identify the performance evaluation of various data mining algorithms.[K3]

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. (15 Hours)

UNIT II

Mining Frequent Patterns, Associations, and Correlations: Basic Concepts and Methods: 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. (20 Hours)

UNIT III

Classification: Basic concepts – Logistic regression - Decision tree induction– Bayesian classification, Rule–based classification-Model Evaluation and selection.(20 Hours)

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. (20 Hours)

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.

(15 Hours)

TEXT BOOK

1. Jiawei Han, Micheline Kamber, Jian Pei (2012), *Data Mining concepts and techniques,* 3rd Edition, Elsevier publication.

REFERENCE BOOKS

1. Ian H. Witten and Eibe Frank, (2005), *Data Mining: Practical Machine Learning Tools and Techniques (Second Edition),* Morgan Kaufmann.
2. Arun K Pujari (2008), D*ata Mining Techniques*, University Press.
3. Daniel T. Larose , Chantal D. Larose (2015), *Data mining and Predictive analytics*, Second Edition, Wiley Publication.
4. G.K. Gupta (2011), *Introduction to Data mining with case studies,* 2nd Edition, PHI Private limited, New Delhi.

Course Code 23UITC61	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1. a.	PSO 1. b.	PSO 2. a.	PSO 2. b.	PSO3	PSO4	PSO 5.a.	PSO 5. b.	PSO 6	PSO 7
CO1	3	3	-	3	2	2	3	2	3	-
CO2	3	2	2	2	2	2	3	3	2	-
CO3	3	2	3	2	2	2	2	3	-	-
CO4	3	3	3	3	3	2	3	3	3	-
CO5	2	3	2	3	3	3	3	3	3	-

Strong (3) Medium (2) 1ow (1)

Dr.A.Bharathi Lakshmi
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Dr.A.Bharathi Lakshmi
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B.SC. INFORMATION TECHNOLOGY – 2025
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Semester VI	**DATA COMMUNICATION AND NETWORKING**	Hours/Week: 6	
Core Course 14		Credits: 5	
Course Code **23UITC62**		Internal 25	External 75

COURSE OUTCOMES:

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

CO1: Recall network types, components, problems, services, protocols and design issues of each layer in reference models to design reliable information communication system. [K1]

CO2: illustrate the types of transmission media, elementary protocols, routing algorithms, error control and flow control to solve technical problems in industry. [K2]

CO3: outline the functionalities of DNS, core knowledge of TCP, IP, collision free protocols& Email to build real time applications. [K2]

CO4: identify the characteristics of data unit, Multiple Access Protocols, Service Primitives, and IP addresses for additional security to meet security issues. [K3]

CO5: apply mode of transmission, network standards, Architecture and Services, communication protocol for better system performance. [K3]

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. (15 Hours)

UNIT II

Data and Signals: Analog and Digital Data - Analog and Digital Signals – Performance.

Digital Transmission: Transmission Modes.

Bandwidth Utilization: Multiplexing and Spreading: Multiplexing: FDM – WDM

- Synchronous TDM -Statistical TDM.

Transmission Media: Guided media - Unguided Media. (20 Hours)

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. (15 Hours)

UNIT IV

Data Link Control: Framing - Flow Control and Error Control - Noiseless Channel: Stop-and-wait Protocol.

Wired LANs: Standard Ethernet-GIGABIT Ethernet

Wireless LAN: Bluetooth

Connecting LANs, Backbone Networks and Virtual LANs: Connecting Devices: Passive Hubs-Repeaters-Active Hubs-Bridges-Two Layer Switches-Routers-Three layer Switches-Gateway. (20 Hours)

UNIT V

Network Layer: Internet Protocol: IPv4 –Ipv6-Transition from IPv4 to IPv6.

Network Layer: Delivery, Forwarding and Routing: Unicast Routing Protocols: Distance Vector Routing-Link state routing. (20 Hours)

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.

WEB RESOURCES

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 Code 23UITC62	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1. a.	PSO 1. b.	PSO 2. a.	PSO 2. b.	PSO3	PSO4	PSO 5.a.	PSO 5. b.	PSO 6	PSO 7
CO1	3	3	-	3	2	2	3	2	3	-
CO2	3	2	2	2	2	2	3	3	2	-
CO3	3	2	3	2	2	2	2	3	-	-
CO4	3	3	3	3	3	2	3	3	3	-
CO5	2	3	2	3	3	3	3	3	3	-

Strong (3) Medium (2) 1ow (1)

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Semester V	**PHP SCRIPTING PRACTICAL**	Hours/Week: 6	
Core Course 15 Practical – VI		Credits: 3	
Course Code **23UITC61P**		Internal 40	External 60

COURSE OUTCOMES:
On completion of the course, the students will be able to

CO1 : illustrate simple programs using PHP and jQuery. [K2]

CO2 : demonstrate the interface setup, styles & themes for the given application [K2]

CO3 : apply the problem and add necessary user interface components, multimedia components and web data source into the application [K3]

CO4 : construct the results by implementing the correct techniques on the web form. [K3]

CO5 : develop the results by implementing the correct techniques on the web form. [K3]

Lab Exercises

1. Control Structures
2. Working with Forms.
3. String Manipulations
4. Arrays
5. Functions
6. Sorting
7. Classes and Objects
8. Cookies and Sessions
9. Graphics
10. Working with single table
11. Working with multiple tables

12. Event Handling

13. Handling HTML Forms with jQuery

Course Code 23UITC61P	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4	PSO 5.a	PSO 5.b	PSO6	PSO7
CO1	3	2	3	3	3	3	2	3	1	1
CO2	3	3	3	3	3	3	3	2	1	1
CO3	2	2	3	3	3	3	3	2	2	1
CO4	2	2	3	2	2	3	2	1	3	1
CO5	1	2	3	3	2	3	1	2	2	1

Strong (3) Medium (2) Low (1)

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Semester VI	**ARTIFICIAL INTELLIGENCE**	Hours/Week: 5	
DSEC 3		Credits: 4	
Course Code **23UITE61**		Internal 25	External 75

COURSE OUTCOME:

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

CO1: list the agents ,search algorithms and learning methodology to acquire the knowledge of the basis of Artificial Intelligence.[K1]

CO2: summarize the evolution of AI, problem solving techniques and defining uncertainty helps to gain ability to familiarize the latest trends in technological development.[K2]

CO3: illustrate the AI concepts to made decision for both simple and complex real world problems. [K2]

CO4: apply the nature of agents along with searching problems , inference on Bayesian networks and learning techniques to enhance the practical knowledge of human computer interaction.[K3]

CO5: identify the key concepts used in AI such as rationality, problem solving techniques, temporal models, and reinforcement learning helps to carry out AI oriented IT projects. [K3]

UNIT I

Introduction: Introduction to AI – The History of AI. **Intelligent Agents:** Agents and Environments – Good behavior: The concept of Rationality-The Nature of Environments-The Structure of Agents. (15 Hours)

UNIT II

Solving Problems by Searching: Problem Solving Agents-Example Problems-Searching for Solutions- Depth first and Breadth first search, Heuristic search, Greedy Best first search, A* algorithm, **Adversial Search**: Games-Optimal Decisions in Games. (15 Hours)

UNIT III

Quantifying Uncertainity: Basic Probability Notation – Inference using Full Joint Distributions-Bayes' rule and its use. **Probabilistic Reasoning :** The Semantics of Bayesian Networks- Representation of Conditional distributions-Exact Inference in Bayesian Networks- **Probabilistic Reasoning Over Time:** Inference in temporal models- hidden Markov model.

(15 Hours)

UNIT IV

Making Simple decisions: Combining beliefs and desires under Uncertainty- The basics of utility theory-utility functions. **Making Complex Decisions:** Value Iteration, Policy Iteration and Partially observable MDPs. (15 Hours)

UNIT V

Reinforcement Learning : Introduction-Passive reinforcement learning-Active reinforcement learning-Generalization in Reinforcement Learning-Policy Search-Applications of Reinforcement Learning. (15 Hours)

TEXT BOOKS

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 Artifical Intelligence*, Khanna Publishing House, Delhi.
2. Saroj Kaushik (2011), *Artificial Intelligence,* Cengage Learning India.
3. David Poole and Alan Mackworth (2010), *Artificial Intelligence: Foundations for Computational Agents*, Cambridge University Press.

WEB RESOURCES

1. NPTEL & MOOC courses titled Artificial Intelligence and Expert Systems
2. https://nptel.ac.in/courses/106106140/
3. https://nptel.ac.in/courses/106106126/

Course Code 23UITE61	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1. a.	PSO 1. b.	PSO 2. a.	PSO 2. b.	PSO3	PSO4	PSO 5.a.	PSO 5. b.	PSO 6	PSO 7
CO1	3	3	1	2	2	2	3	2	1	1
CO2	3	2	2	2	2	2	3	3	1	1
CO3	3	2	3	2	2	2	2	3	1	1
CO4	3	3	3	1	3	2	3	3	1	1
CO5	2	3	2	1	3	3	3	3	1	1

Strong (3) Medium (2) Low (1)

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Quality Education with Wisdom and Values

B.SC. INFORMATION TECHNOLOGY – 2025
(for those who join in 2023 – 2024)

Semester VI	**NATURAL LANGUAGE PROCESSING**	Hours/Week: 5	
DSEC 3		Credits: 4	
Course Code **23UITE62**		Internal 25	External 75

COURSE OUTCOMES:
On completion of the course, the students will be able to

CO1 : recall the fundamental concepts and techniques of natural language processing.. [K1]

CO2 : distinguish among the various techniques, taking into account the assumptions, strengths, and weaknesses of each [K2]

CO3 : illustrate appropriate descriptions, visualizations, and statistics to communicate the problems and their solutions. [K2]

CO4 : Construct large volume text data generated from a range of real-world applications. [K3]

CO5 : develop robotic process automation to manage business processes and to increase and monitor their efficiency and effectiveness. [K3]

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. (15 Hours)

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. (15 Hours)

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. (15 Hours)

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. (15 Hours)

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: WorldNet-Frame NetStemmers- POS Tagger- Research Corpora SSAS. (15 Hours)

TEXT BOOKS

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

REFERENCE BOOK

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

WEB RESOURCES

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

Course Code 23UITE62	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1. a.	PSO 1. b.	PSO 2. a.	PSO 2. b.	PSO3	PSO4	PSO 5.a.	PSO 5. b.	PSO6	PSO7
CO 1	3	2	1	3	2	1	2	3	3	1
CO 2	3	3	1	2	2	1	3	2	1	1
CO 3	3	3	1	1	3	2	3	3	3	1
CO 4	3	3	2	3	3	2	2	3	2	1
CO 5	3	3	1	3	3	2	3	2	2	1

Strong (3) Medium (2) Low (1)

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B.Sc. INFORMATION TECHNOLOGY (SEMESTER)

(for those who join in 2023 – 2024)

Semester: VI	**MACHINE LEARNING USING AI PRACTICAL**	Hours/Week: 5	
DSEC 4 Practical		Credits: 3	
Course Code		Internal	External
23UITE63P		40	60

COURSE OUTCOMES

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

CO1: classify the basic commands of mathematical principles from probability, linear algebra and optimization in statistical analysis which helps to pursue flexible career paths. [K2]

CO2: demonstrate the integrated collection of tools for knowledge of machine learning to make predictions in a scientific computing environment to produce effective designs and solutions for specific real-time problems. [K2]

CO3: identify the latest technologies and synthesize the workspace of current underlying mathematical relationships within and across machine learning algorithms and the paradigms of supervised and un-supervised learning to solve real-time projects skill. [K3]

CO4: apply the different types of graphs in an interactive manner and packages to execute the projects effectively with intelligent systems. [K3]

CO5: examine the statistical analysis method and advanced topics such as robotics, machine learning, deep learning, pattern recognition, computer vision, cognitive computing, human-computer interaction which constantly upgrade their skills. [K3]

LAB EXERCISES

1. Introduction of various python libraries used for machine learning.
2. Write a Program to implement Uninformed Search Technique: Breadth First Search
3. Write a Program to implement Uninformed Search Technique: Depth First Search

4. Write a Program to implement Informed Search Technique: A* Algorithm
5. Write a Program to implement Informed Search Technique: AO* Algorithm
6. Write a Program to implement Local Search Technique: Hill Climbing Algorithm
7. Write a Program to implement Game Playing Algorithms: Minimax and Alpha Beta Pruning
8. Program to Implement N Queens Problem using Python
9. Implement and demonstrate the FIND-S algorithm for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a .CSV file.
10. For a given set of training data examples stored in a .CSV file, implement and demonstrate the Candidate-Elimination algorithm to output a description of the set of all hypotheses consistent with the training examples.
11. Write a program to demonstrate the working of the decision tree based ID3 algorithm. Use an appropriate data set for building the decision tree and apply this knowledge to classify a new sample.
12. Write a program to implement the naïve Bayesian classifier for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering few test data sets.
13. Assuming a set of documents that need to be classified, use the naïve Bayesian Classifier model to perform this task. Calculate the accuracy, precision, and recall for your data set.
14. Write a program to construct a Bayesian network considering medical data. Use this model to demonstrate the diagnosis of heart patients using standard Heart Disease Data Set.
15. Apply EM algorithm to cluster a set of data stored in a .CSV file. Use the same data set for clustering using k-Means algorithm. Compare the results of these two algorithms and comment on the quality of clustering.

Course Code 23UITE63P	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1. a.	PSO 1. b.	PSO 2. a.	PSO 2. b.	PSO3	PSO4	PSO 5.a.	PSO 5. b.	PSO6	PSO7
CO 1	3	2	1	3	2	1	2	3	2	1
CO 2	3	3	1	2	2	1	3	2	2	1
CO 3	3	3	1	1	3	2	3	3	2	1
CO 4	3	3	2	3	3	2	2	3	2	1
CO 5	3	3	1	3	3	2	3	2	2	1

Strong (3) Medium (2) Low (1)

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B.Sc. INFORMATION TECHNOLOGY (SEMESTER)

(for those who join in 2023 – 2024)

Semester: VI	**DEEP LEARNING PRACTICAL**	Hours/Week: 5	
DSEC 4 Practical		Credits: 3	
Course Code		Internal	External
23UITE64P		40	60

COURSE OUTCOME

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

CO1: classify the basic concepts and techniques of Deep Learning and the need of Deep Learning techniques in real-world problems. [K2]

CO2: demonstrate the CNN algorithms and the way to evaluate performance of the CNN architectures to produce effective designs and solutions for specific real-time problems. [K2]

CO3: apply RNN and LSTM to learn, predict and classify the real-world problems in the paradigms of Deep Learning [K3]

CO4: identify the concept of Auto-encoders and enhancing GANs using auto-encoders. [K3]

CO5: examine the design of GANs for the selected problems constantly upgrade their skills. K3]

LAB EXERCISES

1. Build an Artificial Neural Network by implementing the Back propagation algorithm and test the same using appropriate data sets. Vary the activation functions used and compare the results.
2. Build a Deep Feed Forward ANN by implementing the back propagation algorithm and test the same using appropriate data sets. Use the number of hidden layers >=4.
3. Design and implement an Image classification model to classify a dataset of images using Deep Feed Forward NN. Record the accuracy corresponding to the number of epochs. Use the MNIST, CIFAR-10 datasets.
4. Design and implement a CNN model (with 2 layers of convolutions) to classify multi category image datasets. Record the accuracy corresponding to the number of epochs. Use the MNIST, CIFAR-10 datasets.

5. Design and implement a CNN model (with 4+ layers of convolutions) to classify multi category image datasets. Use the MNIST, Fashion MNIST, CIFAR-10 datasets. Set the No. of Epoch as 5, 10 and 20. Make the necessary changes whenever required. Record the accuracy corresponding to the number of epochs. Record the time required to run the program, using CPU as well as using GPU in Colab.
6. Design and implement a CNN model (with 2+ layers of convolutions) to classify multi category image datasets. Use the concept of padding and Batch Normalization while designing the CNN model. Record the accuracy corresponding to the number of epochs. Use the Fashion MNIST/MNIST/CIFAR10 datasets.
7. Design and implement a CNN model (with 4+ layers of convolutions) to classify multi category image datasets. Use the concept of regularization and dropout while designing the CNN model. Use the Fashion MNIST datasets. Record the Training accuracy and Test accuracy corresponding to the following architectures:
    a. Base Model
    b. Model with L1 Regularization
    c. Model with L2 Regularization
    d. Model with Dropout
    e. Model with both L2 (or L1) and Dropout
8. Use the concept of Data Augmentation to increase the data size from a single image.
9. Design and implement a CNN model to classify CIFAR10 image dataset. Use the concept of Data Augmentation while designing the CNN model. Record the accuracy corresponding to the number of epochs.
10. Implement the standard LeNet-5 CNN architecture model to classify multi -category image dataset (MNIST, Fashion MNIST) and check the accuracy.
11. Implement the standard VGG-16 & 19 CNN architecture model to classify multi category image dataset and check the accuracy.
12. Implement RNN for sentiment analysis on movie reviews.
13. Implement Bidirectional LSTM for sentiment analysis on movie reviews.
14. Implement Generative Adversarial Networks to generate realistic Images. Use MNIST, Fashion MNIST or any human face datasets.
15. Implement Auto encoders for image denoising on MNIST, Fashion MNIST or any suitable dataset.

Course Code 23UITE64P	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1. a.	PSO 1. b.	PSO 2. a.	PSO 2. b.	PSO3	PSO4	PSO 5.a.	PSO 5. b.	PSO6	PSO7
CO 1	3	2	1	3	2	1	2	3	2	1
CO 2	3	3	1	2	2	1	3	2	2	1
CO 3	3	3	1	1	3	2	3	3	3	1
CO 4	3	3	2	3	3	2	2	3	2	1
CO 5	3	3	1	3	3	2	3	2	2	1

Strong (3) Medium (2) Low (1)

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B.Sc. INFORMATION TECHNOLOGY
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Semester VI	**MULTIMEDIA PRACTICAL**	Hours/Week: 2	
SEC 7		Credits: 2	
Course Code **23UITS61P**		Internal 40	External 60

COURSE OUTCOME

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

CO1: illustrate the GIMP tools to write the basic text and image effects. [K2]

CO2: develop basic animation effects and use the drawing and painting tools in GIMP and canva to write the various effects. [K2]

CO3: explore the edited GIMP image and canva file. [K3]

CO4: complete the animation to design cards, Banner and packaging design using Canva. [K3]

CO5: develop the ability to edit photos and create their own 2D short animation film to meet the emerging demand and contemporary challenges. [K3]

LAB EXERCISES

GIMP

1. Enlarge a Logo using path
2. Create an ink drawing using path
3. Replace Background of image using Channels.
4. Design Front Cover for a Book.
5. Create a customized logo
6. Use clone tool to remove text from an image
7. Remove Red eye using Filter.
8. Morphing - Create smooth transitions from one image to another.
9. Create a Story board for your project

CANVA

10. Designing a Banner
11. Designing a Brochure
12. Designing a Pamphlet
13. Designing a Hotel Menu Card
14. Designing a Invitation
15. Designing a Product Packaging Design
16. Designing a Certificate
17. Designing a Flyer
18. Prepare a Resume
19. Design a Book Cover

Course Code 23UITS61P	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1. a.	PSO 1. b.	PSO 2. a.	PSO 2. b.	PSO3	PSO4	PSO 5.a.	PSO 5. b.	PSO6	PSO7
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CO 3	3	3	1	1	3	2	3	3	3	1
CO 4	3	3	2	3	3	2	2	3	2	1
CO 5	3	3	1	3	3	2	3	2	2	1

Strong (3) Medium (2) Low (1)

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