V.V.VANNIAPERUMAL COLLEGE FOR WOMEN
(Belonging to Virudhunagar Hindu Nadars)
An Autonomous Institution Affiliated to Madurai Kamaraj University, Madurai
Re-accredited with 'A' Grade (3rd Cycle) by NAAC
VIRUDHUNAGAR – 626 001

PEOs, POs, PSOs and COs
B.Sc. COMPUTER SCIENCE

Programme Educational Objectives (PEOs)

PEOs are broad statements that describe the career and professional achievements, that the Programme is preparing the graduates to achieve within the first few years after graduation. PEOs are framed for each Programme and should be consistent with the Mission of the Institution.

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. Communicate proficiently and confidently with the ability to express original/complex ideas effectively in different situations. (*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, synthesise and evaluate data, theories and ideas to provide valid suggestions for the betterment of the society. (*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)*

Programme Educational Objectives (PEOs)

PEO1   Students gain knowledge and expertise in advanced domains of Computer Science like website design, mobile apps development and data analytics.

PEO2   The rural women students will emerge as eminent software professionals with team building capacity and leadership quality to suit the modern software industry.

PEO3   The students imbibe moral values and professional ethics to shape themselves as skilled persons to work as an individual with topical updates and as a team to contribute towards the need of industry and society.

Key Components of Mission Statement	Programme Educational Objectives (PEOs)		
	PEO1	**PEO2**	**PEO3**
transforming rural women students		√	
eminent students	√	√	√
prepared for a globalized technological era	√	√	
a passion to strive for perpetual personal uplift			√

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.

On completion of B.Sc. Computer Science programme, the students will be able to

PO1 - *Disciplinary Knowledge*

    PSO 1.a: apply principles, methods and techniques of various domains of Computer Science and courses related to Computer Science to a wide range of applications.

    PSO 1.b: use modern software development tools, packages and platforms.

PO2 - *Communication Skills*

    PSO 2.a: give and receive clear instructions, write effectual reports, design documentation and make remarkable presentations on concepts related to Computer Science.

    PSO 2.b: express complex technical ideas effectively to peers, other assemblage like IT community and the entire society.

PO3 - *Scientific Reasoning and Problem Solving*

    PSO 3: design and develop computer programs using programming languages efficiently, in the areas related to database management, mobile applications, operating systems and web design.

PO4 - *Critical Thinking and Analytical Reasoning*

    PSO 4: analyse real world problems, identify and formulate the computing requirements appropriate to give efficient and constructive solutions in different fields of Computer Science and for environmental sustainability.

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

    PSO 5.a: create high quality e-content for demonstrating complex concepts; pursue the appropriate Massive Open Online Courses.

    PSO 5.b: adapt to an ever-changing technological landscape by pursuing higher studies and engaging in independent and life-long learning.

PO6 - *Cooperation/Team Work and Multi-Cultural Competence*

    PSO 6: demonstrate the knowledge of technological and management principles to work as a member or leader, with multicultural competence in diverse teams of software projects.

PO7 - *Moral and Ethical Awareness*

    PSO 7: develop innovative applications as an employee of a company or an entrepreneur, employing contemporary technologies adhering to ethical, security and legal issues of Internet and Cyber systems.

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Semester I	OBJECT ORIENTED PROGRAMMING WITH C++	Hours/Week: 5	
Core Course 1		Credits: 4	
Course Code 20UCSC11		Internal 25	External 75

COURSE OUTCOMES

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

CO1: recognize the features of object oriented paradigm. [K1]

CO2: describe constructor, friend function, inline function and virtual function. [K2]

CO3: discuss overloading, inheritance and polymorphism. [K2]

CO4: summarize the concepts of manipulators, pointers, data hiding and data reusability. [K3]

CO5: demonstrate the object oriented programming concepts through C++ programs. [K4]

Course Code 20UCSC11	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	PSO 6	PSO 7
CO1	M	L	L	-	L	L	-	L	-	-
CO2	H	M	M	M	M	L	-	L	-	-
CO3	H	M	H	M	M	M	M	M	-	L
CO4	H	M	H	M	M	M	M	M	-	L
CO5	H	M	H	H	H	M	M	M	-	M

Semester I	OBJECT ORIENTED PROGRAMMING USING C++ LAB	Hours/Week: 5	
Core Course Practical I		Credits: 3	
Course Code 20UCSC11P		Internal 40	External 60

COURSE OUTCOMES

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

CO1: illustrate basic concepts of object oriented programming using C++ programs. [K3]

CO2: write C++ programs to implement the concepts of classes, objects, function overloading and operator overloading. [K3]

CO3: execute C++ modules to exhibit object oriented programming concepts like inheritance and polymorphism. [K3]

CO4: select appropriate formatted console input and output functions for neat output and take printout. [K3]

CO5: detect applications of object oriented programming in real life. [K4]

Course Code 20UCSC11P	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	PSO 6	PSO 7
CO1	H	H	M	L	M	L	L	-	L	-
CO2	H	H	H	M	H	M	L	-	L	-
CO3	H	M	H	M	M	M	M	M	M	L
CO4	H	L	H	M	M	L	M	M	M	M
CO5	H	H	H	M	H	H	M	H	M	M

Semester I		Hours/Week: 4	
Allied Course 1	**NUMERICAL METHODS**	Credits: 4	
Course Code		Internal	External
20UCSA11		25	75

COURSE OUTCOMES:

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

CO1: define the fundamental concepts in numerical methods. [K1]

CO2: explain appropriate numerical methods for solving problems in other disciplines. [K2]

CO3: solve differential equations and find the missing data using numerical methods. [K3]

CO4: apply numerical methods for obtaining the approximate solutions of algebraic, transcendental, simultaneous, and differential equations. [K3]

CO5: analyze the numerical solutions and solutions obtained by ordinary methods. [K4]

Course Code 20UCSA11	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	H	M	H	H	H	H	-
CO2	H	M	H	H	H	L	-
CO3	H	M	H	H	H	H	-
CO4	H	H	H	H	H	L	-
CO5	H	H	H	H	H	M	-

Semester I		Hours/Week: 1 T + 1 P	
SEC 1 Practical I	**DTP LAB**	Credits: 2	
Course Code		Internal	External
20UCSS11P		40	60

COURSE OUTCOMES

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

CO1: list out various tools of Photoshop and CorelDraw. [K3]

CO2: write steps to apply various Photoshop tools, filters and effects. [K3]

CO3: show the skill of working with multiple layers in Photoshop and multiple pages in CorelDraw. [K3]

CO4: layout invitations, greeting cards, visiting cards, logos and pamphlets and prepare record. [K3]

CO5: identify the Photoshop and CorelDraw tools employed in a pamphlet. [K4]

Course Code 20UCSS11P	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	PSO 6	PSO 7
CO1	M	M	M	M	-	-	M	-	L	-
CO2	H	M	M	M	-	-	M	-	-	-
CO3	H	H	H	M	-	-	M	-	L	-
CO4	H	M	H	M	-	M	M	M	L	L
CO5	H	H	H	M	-	M	M	M	-	M

Semester I	VALUE EDUCATION (2020 -21 onwards)	Hours/Week: 2	
		Credits: 2	
Course Code 20UGVE11 20UBCC11		Internal 100	External -

COURSE OUTCOMES

On completion of the course, students will be able to

CO1: describe the general human values and their associated values that are essential to make them committed and responsible individuals. [K1]

CO2: indicate the importance and benefits of upholding human values. [K2]

CO3: explain the steps to be taken for upholding human values and human rights. [K2]

CO4: practice the individual values needed for maintaining harmonious relationship with members of family, institution, organization or society for preserving and transmitting its tradition and culture. [K3]

CO5: uphold the legal, moral, ethical and spiritual values for nurturing health and happiness leading to national integrity and peace and for the existence of human beings with humanity. [K3]

Course Code 20UGVE11	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	H	M	-	-	L	-	H
CO2	H	M	-	-	L	-	H
CO3	H	M	-	-	L	-	H
CO4	H	M	-	-	H	H	H
CO5	H	M	-	-	L	H	H

Semester II		Hours/Week: 5	
Core Course 2	**DATA STRUCTURES**	**Credits: 4**	
Course Code		**Internal**	**External**
20UCSC21		**25**	**75**

COURSE OUTCOMES

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

CO1:   define the data structures used to represent data in memory. [K1]

CO2:   explain the linear and non-linear data structures as ADT. [K2]

CO3:   apply operations specified in ADT of linear and non-linear data structures through algorithms. [K3]

CO4:   use suitable data structures for solving problems. [K3]

CO5:   analyse the data structures and their performance. [K4]

Course Code 20UCSC21	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	PSO 6	PSO 7
CO1	M	L	L	-	L	-	-	-	-	-
CO2	H	M	M	L	M	M	M	M	-	-
CO3	H	M	M	M	M	M	M	M	-	-
CO4	H	M	M	M	M	H	M	M	-	-
CO5	H	M	M	M	M	H	M	M	-	-

Semester II	DATA STRUCTURES	Hours/Week: 5	
Core Course 2		Credits: 4	
Course Code 20UCSC21N		Internal 25	External 75

COURSE OUTCOMES

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

CO1: define the data structures used to represent data in memory. [K1]

CO2: explain the linear and non-linear data structures as ADT. [K2]

CO3: apply operations specified in ADT of linear and non-linear data structures through algorithms. [K3]

CO4: use suitable data structures for solving problems. [K3]

CO5: analyse the time complexity of algorithms manipulating data structures and their performance. [K4]

Course Code 20UCSC21N	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	PSO 6	PSO 7
CO1	H	-	-	-	H	-	-	M	-	-
CO2	H	-	M	M	M	-	M	M	M	-
CO3	H	-	M	-	M	M	-	M	-	-
CO4	H	M	-	-	H	M	M	H	-	-
CO5	H	M	-	-	H	H	-	H	M	-

Semester II		Hours/Week: 5	
Core Course Practical II	DATA STRUCTURES USING C++ LAB	Credits: 3	
Course Code 20UCSC21P		Internal 40	External 60

COURSE OUTCOMES

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

CO1 : illustrate linear and non-linear data structures. [K3]

CO2 : implement operations like search, merge, insertion and deletion on various data structures. [K3]

CO3 : execute programs using data structures to solve real life problems. [K3]

CO4 : prepare record with formatted outputs. [K3]

CO5 : analyse performance of array and linked list representations of data structures. [K4]

Course Code 20UCSC21P	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	PSO 6	PSO 7
CO1	H	L	M	M	M	M	M	M	M	-
CO2	H	H	M	M	M	M	M	M	M	L
CO3	H	H	M	M	M	M	M	M	M	L
CO4	L	L	H	-	-	-	L	-	-	-
CO5	H	H	M	M	H	H	M	M	M	-

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Semester II		Hours/Week: 4	
Allied Course 2	**PROBABILITY AND**	**Credits: 4**	
Course Code	**STATISTICS**	**Internal**	**External**
20UCSA21		**25**	**75**

COURSE OUTCOMES

On completion of this course, students will be able to

CO1: define the basic concepts in Probability and Statistics. [K1]

CO2: explain the statistical tools used in data analysis. [K2]

CO3: calculate some statistical constants to get statistical inference. [K3]

CO4: apply the statistical methods to solve real life problems. [K3]

CO5: analyze the statistical data to draw conclusion in Probabilities, Correlation, Regression and in testing of hypothesis. [K4]

Course Code 20UCSA21	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	H	M	H	H	H	L	-
CO2	H	H	H	H	H	L	-
CO3	H	H	H	H	H	L	-
CO4	H	M	H	H	H	H	-
CO5	H	M	H	M	H	H	-

Semester II			Hours/Week: 2	
SEC 2		**DIGITAL PRINCIPLES**	Credits: 2	
Course Code			Internal	External
20UCSS21			40	60

COURSE OUTCOMES

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

CO1: review the various number systems, digital circuits, logic gates, Boolean laws and theorems. [K1]

CO2: discuss the functioning of gates, combinational logic circuits, data processing circuits, arithmetic circuits, Flip Flops, Registers, Counters and number systems. [K2]

CO3: demonstrate various digital circuits and number conversions. [K3]

CO4: apply Boolean laws and Karnaugh Map for simplification of Boolean expressions. [K3]

CO5: explore different digital circuits. [K4]

Course Code 20UCSS21	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	PSO 6	PSO 7
CO1	H	-	H	-	-	-	H	M	-	-
CO2	H	-	H	-	-	-	H	M	-	-
CO3	H	-	H	H	L	-	H	M	-	-
CO4	H	-	H	-	L	M	H	M	-	-
CO5	H	-	M	-	-	H	H	H	-	-

Semester II	DIGITAL PRINCIPLES	Hours/Week: 2	
SEC 2		Credits: 2	
Course Code 20UCSS21N		Internal 40	External 60

COURSE OUTCOMES

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

CO1: learn about number systems, coding systems, digital circuits, large assemblies of logic gates and Boolean laws & theorems. [K1]

CO2: describe the functioning of gates, combinational logic circuits, data processing circuits, arithmetic circuits, Flip Flops, Registers, Counters and number systems. [K2]

CO3: build various digital circuits to store, process and communicate digital information in the various domains. [K3]

CO4: perform number conversions and simplification of Boolean expressions using Boolean laws and Karnaugh Map. [K3]

CO5: explore different digital circuits. [K4]

Course Code 20UCSS21N	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	PSO 6	PSO 7
CO1	H	-	L	-	-	-	M	M	-	-
CO2	H	-	M	-	-	-	H	H	-	-
CO3	H	-	H	H	M	-	H	H	M	M
CO4	H	-	H	H	-	M	H	H	M	-
CO5	H	-	H	M	M	H	H	H	M	-

V.V.VANNIAPERUMAL COLLEGE FOR WOMEN

Semester II		Hours/Week: 1 T + 1P	
SEC 3 Practical II	**WEB DESIGN LAB**	Credits: 2	
Course Code		Internal	External
20UCSS21P		40	60

COURSE OUTCOMES

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

CO1: write programs using various HTML elements. [K3]

CO2: write programs using different types of CSS stylesheets. [K3]

CO3: demonstrate appropriate transition and animation effects on objects in web page.[K3]

CO4: create forms in a neat format and prepare record with outputs of different programs. [K3]

CO5: plan simple unique personal and business web pages using HTML and CSS. [K4]

Course Code 20UCSS21P	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	PSO 6	PSO 7
CO1	M	M	-	-	M	-	M	L	-	-
CO2	M	M	M	M	H	-	H	L	-	-
CO3	H	H	M	-	L	M	M	M	L	-
CO4	H	H	M	M	H	M	M	H	-	-
CO5	H	H	M	M	H	H	H	H	M	H

Semester III		Hours/Week: 4	
Core Course 3	**PROGRAMMING WITH JAVA**	Credits: 4	
Course Code 20UCSC31		Internal 25	External 75

COURSE OUTCOMES

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

CO1: describe data types, operators, expressions, control statements and object oriented paradigm. [K1]

CO2: infer user-defined packages, interface, applet, multi-threads and exceptions. [K2]

CO3: demonstrate arrays, strings, vectors, polymorphism, user-defined packages, interface, multi-threads and applets. [K3]

CO4: differentiate applets from Java console applications, built-in exceptions and user defined exceptions. [K4]

CO5: assess various types of exceptions and use of object oriented paradigm. [K5]

Course Code 20UCSC31	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	PSO 6	PSO 7
CO1	H	H	L	M	L	M	M	M	-	-
CO2	H	H	L	H	M	H	H	H	-	-
CO3	H	H	M	H	M	H	H	H	-	-
CO4	H	H	L	H	H	H	H	H	-	M
CO5	H	H	L	H	H	H	M	H	-	M

Semester III		Hours/Week: 4	
Core Course 4	**COMPUTER ORGANIZATION**	**Credits: 3**	
Course Code 20UCSC32		**Internal 25**	**External 75**

COURSE OUTCOMES

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

CO1: observe the basic components and architecture of computing systems. [K1]

CO2: explain the functionality of Central Processing, Control, Memory and Input/Output units. [K2]

CO3: examine the arithmetic algorithms using different data representations. [K3]

CO4: compare the various types of Input/Output, Memory and Multiprocessor systems. [K4]

CO5: appraise the recent computer systems in terms of speed, technology, cost and performance. [K5]

Course Code 20UCSC32	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	PSO 6	PSO 7
CO1	H	-	L	L	-	L	H	M	-	-
CO2	H	-	M	M	L	L	M	M	-	-
CO3	H	M	L	L	L	L	M	M	-	-
CO4	H	L	M	M	L	M	M	M	-	L
CO5	H	L	L	M	M	H	L	H	-	M

Semester III		Hours/Week: 4	
Core Course Practical III	PROGRAMMING USING JAVA LAB	Credits: 2	
Course Code 20UCSC31P		Internal 40	External 60

COURSE OUTCOMES

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

CO1: implement control structures, arrays, strings, functions, inheritance, interface and threads in Java programs. [K3]

CO2: write Java programs using built-in functions and exceptions. [K3]

CO3: execute Java programs for various inputs. [K3]

CO4: prepare record with Java programs using basic object oriented programming concepts, user-defined packages, multi-threads and exception concepts. [K3]

CO5: examine implementation of simple graphical methods using Java applets. [K4]

Course Code 20UCSC31P	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	PSO 6	PSO 7
CO1	H	M	M	M	H	L	L	L	-	-
CO2	H	M	H	M	H	M	L	M	-	L
CO3	H	M	H	M	M	M	M	M	M	-
CO4	H	M	H	L	M	M	L	M	-	-
CO5	H	H	H	M	H	M	H	H	M	M

Semester III	RESOURCE MANAGEMENT TECHNIQUES	Hours/Week: 4	
Allied Course 3		Credits: 4	
Course Code 20UCSA31		Internal 25	External 75

COURSE OUTCOMES

On completion of the course, students will be able to

CO1: define the basic concepts in transportation, queuing theory, inventory control and network routing problems. [K1]

CO2: explain various methodologies involved in resource management techniques. [K2]

CO3: apply the acquired skills to formulate the problems in real life situations. [K3]

CO4: solve the problems in transportation, inventory control, queuing model and network scheduling in various domains. [K3]

CO5: analyze the solutions to various problems using optimization techniques. [K4]

Course Code 20UCSA31	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	H	M	L	H	M	L	-
CO2	H	M	-	H	M	L	-
CO3	H	M	L	H	M	L	-
CO4	H	M	L	H	M	L	-
CO5	H	M	L	H	M	L	-

Semester III		Hours/Week: 2	
Non Major Elective Course- 1	**INTRODUCTION TO COMPUTERS AND OFFICE AUTOMATION**	Credits: 2	
Course Code 20UCSN31		Internal 40	External 60

COURSE OUTCOMES

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

CO1:   outline the characteristics of computers and essential components of system. [K1]

CO2:   recognize the features of Windows 7, Microsoft Office Word 2010 and Microsoft Office Excel 2010. [K1]

CO3:   describe working with files, folders, pictures, tables and mail. [K2]

CO4:   discuss manipulation of components of spread sheet. [K2]

CO5:   apply formatting on elements of Word and Excel. [K3]

Course Code 20UCSN31	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	M	L	L	L	L	-	-
CO2	M	L	L	L	L	-	-
CO3	M	M	M	L	L	-	-
CO4	M	M	L	M	M	-	-
CO5	M	H	L	M	L	-	-

Semester III		Hours/Week: 1
Generic Elective Course - 1	**HUMAN RIGHTS**	**Credit : 1**
Course Code 20UGEH31		**Internal 100**

COURSE OUTCOMES

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

CO1: recall the importance of Human Rights as a citizen. [K1]

CO2: recognise the concepts, laws and violations of Human Rights. [K1]

CO3: summarise their knowledge on evolution and growth Human Rights. [K2]

CO4: paraphrase the historical values of Human Rights in Peace building. [K2]

CO5: identify the works of National an Human Rights. [K3]

Course Code 20UGEH31	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	H	M	-	-	-	-	-
CO2	H	M	-	-	-	-	-
CO3	H	M	-	-	-	M	-
CO4	H	M	-	-	M	M	H
CO5	H	M	-	-	M	M	H

Semester IV			Hours/Week: 4	
Core Course 5		**WEB PROGRAMMING**	Credits: 4	
Course Code 20UCSC41			Internal 25	External 75

COURSE OUTCOMES

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

CO1: recognize fundamentals of Internet, JavaScript, XML, Ajax and PHP. [K1]

CO2: infer Java Script, XML, Ajax programming concepts and PHP scripts to handle HTML Forms. [K2]

CO3: implement programs using HTML, JavaScript, Ajax and PHP. [K3]

CO4: examine interaction between HTML, JavaScript, Ajax and PHP. [K4]

CO5: assess various functionalities of JavaScript, XML, Ajax and PHP. [K5]

Course Code 20UCSC41	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	PSO 6	PSO 7
CO1	M	M	-	L	M	-	M	M	-	-
CO2	H	H	M	M	M	L	M	M	-	-
CO3	H	H	M	M	H	L	M	M	-	-
CO4	H	H	M	M	H	M	M	M	-	-
CO5	H	H	M	M	H	M	M	M	-	M

Semester IV			Hours/Week: 4	
Core Course Practical IV		**WEB PROGRAMMING LAB**	Credits: 2	
Course Code 20UCSC41P			Internal 40	External 60

COURSE OUTCOMES

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

CO1: write JavaScript programs using conditional statements, looping statements, built-in objects, functions and control structures. [K3]

CO2: develop interactive JavaScript programs and database manipulation programs using PHP and MySQL. [K3]

CO3: enter and execute JavaScript, PHP and MySQL programs. [K3]

CO4: prepare output of interactive JavaScript programs and database manipulations. [K3]

CO5: plan dynamic webpages using HTML and JavaScript. [K4]

Course Code 20UCSC41P	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	PSO 6	PSO 7
CO1	H	-	H	M	H	M	L	L	-	-
CO2	H	H	M	M	H	H	M	M	L	L
CO3	H	M	M	-	H	H	L	M	-	-
CO4	H	M	H	-	-	-	L	L	-	-
CO5	H	H	M	M	H	H	M	M	M	M

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Semester IV		Hours/Week: 4	
Core Course Practical IV	**WEB PROGRAMMING LAB**	**Credits: 2**	
Course Code 20UCSC41PN		**Internal 40**	**External 60**

COURSE OUTCOMES

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

CO1:   use conditional statements, looping statements and functions in JavaScript. [K3]

CO2:   employ JavaScript built-in objects in web programming. [K3]

CO3:   experiment database manipulation using PHP and MySQL. [K4]

CO4:   develop interactive JavaScript programs. [K6]

CO5:   create dynamic webpages using HTML and JavaScript. [K6]

Course Code 20UCSC41PN	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	PSO 6	PSO 7
CO1	H	M	M	-	H	-	L	-	-	-
CO2	H	M	M	-	H	-	-	-	-	-
CO3	H	H	M	M	H	-	M	-	-	-
CO4	H	H	M	M	H	M	M	M	-	M
CO5	H	H	M	M	H	M	M	M	-	M

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VIRUDHUNAGAR – 626 001

Semester IV		Hours/Week: 4	
Allied Course 4	**QUANTITATIVE APTITUDE**	Credits: 4	
Course Code 20UCSA41		**Internal 25**	**External 75**

COURSE OUTCOMES

On completion of the course, students will be able to

CO1: define the basic concepts needed for arithmetic calculations. [K1]

CO2: explain various shortcut methods involved in aptitude problems. [K2]

CO3: apply the acquired computational skills in solving problems. [K3]

CO4: find solutions to various aptitude problems. [K3]

CO5: analyze problems using shortcut methods. [K4]

Course Code 20UCSA41	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	M	M	M	H	M	L	-
CO2	M	M	M	H	M	L	-
CO3	M	M	M	H	M	L	-
CO4	M	M	M	H	M	L	-
CO5	M	M	L	H	M	L	-

Semester IV	SOFTWARE ENGINEERING	Hours/Week: 2	
SEC 4		Credits: 2	
Course Code 20UCSS41		Internal 40	External 60

COURSE OUTCOMES

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

CO1: describe the fundamental concepts of software engineering. [K1]

CO2: discuss the goals, user needs, project requirements, size, design, coding, testing and different models in the software development life cycle. [K2]

CO3: explore design, testing and management of software project. [K3]

CO4: apply Software Engineering design concepts and techniques for software project development. [K3]

CO5: compare software lifecycle model's extensions, design techniques, project estimation techniques. [K4]

Course Code 20UCSS41	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	PSO 6	PSO 7
CO1	H	-	M	-	-	-	L	L	-	-
CO2	H	-	H	L	M	M	L	M	-	-
CO3	H	-	H	M	M	M	L	M	-	-
CO4	H	M	M	M	H	H	M	M	-	H
CO5	H	-	M	M	H	H	M	M	-	H

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Semester IV	**SOFTWARE ENGINEERING**	**Hours/Week: 2**	
SEC 4		**Credits: 2**	
Course Code 20UCSS41N		**Internal 40**	**External 60**

COURSE OUTCOMES

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

CO1: describe the fundamental concepts of software engineering. [K1]

CO2: discuss the goals, user needs, project requirements, size, design, coding, testing
and different models in the software development life cycle. [K2]

CO3: explore design, testing, documentation quality and managing software projects.
[K3]

CO4: apply software engineering design concepts and techniques to software
Project development based on the software engineering ethics. [K3]

CO5: compare the software life cycle model extensions, software documentation types,
design techniques and project estimation techniques. [K4]

Course Code 20UCSS41N	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	PSO 6	PSO 7
CO1	H	-	M	-	-	-	L	L	M	-
CO2	H	-	H	L	M	M	L	M	M	-
CO3	H	-	H	M	M	M	L	M	H	-
CO4	H	M	M	M	H	H	M	M	H	H
CO5	H	-	M	M	H	H	M	M	H	H

Semester IV		Hours/Week: 1 T + 1P	
SEC 5 Practical IV	**PYTHON PROGRAMMING LAB**	Credits: 2	
Course Code 20UCSS41P		Internal 40	External 60

COURSE OUTCOMES

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

CO1: write Python programs for various control structures of Python. [K3]

CO2: draw flow chart and write programs for various program structures of Python. [K3]

CO3: demonstrate data representation using List, Tuple and GUI applications in Python. [K3]

CO4: print formatted output for various data types of Python and draw the output for GUI applications. [K3]

CO5: explore the uses of Python programs. [K4]

Course Code 20UCSS41P	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	PSO 6	PSO 7
CO1	H	H	L	L	M	M	M	L	L	-
CO2	H	H	M	L	M	M	M	L	L	-
CO3	H	H	M	M	M	M	H	M	L	-
CO4	H	H	M	L	L	L	L	L	L	-
CO5	H	H	H	H	H	H	M	H	H	M

Semester IV		Hours/Week: 1 T + 1 P	
SEC 5 Practical III	**PHP AND MYSQL LAB**	Credits: 2	
Course Code 22UCSS41P		Internal 40	External 60

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

CO1: formulate the web pages that communicates information effectively to the user.

[K3]

CO2: design the web page by identifying the proper tools and techniques. [K3]

CO3: develop the interactive and dynamic web page through the source code with the help Of appropriate editor. [K3]

CO4: demonstrate the webpage using suitable browser for various real-time inputs. [K3]

CO5: examine the webpage for the necessary data validation and for web ethics.[K4]

Course Code 22UCSS41P	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	PSO 6	PSO 7
CO1	H	H	H	H	H	M	M	H	H	H
CO2	H	H	H	H	H	M	M	H	H	M
CO3	M	M	M	L	M	-	-	-	M	M
CO4	L	L	M	L	L	-	-	-	L	-
CO5	H	H	H	H	H	H	M	H	L	H

Semester IV	INTRODUCTION TO INTERNET AND HTML 5	Hours/Week: 2	
Non Major Elective Course -2		Credits: 2	
Course Code 20UCSN41		Internal 40	External 60

COURSE OUTCOMES

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

CO1: describe the features of the web, web browser, E-Mail and HTML tags. [K1]

CO2: summarize the purpose of browsers, Mailing software, HTML tags. [K2]

CO3: discuss the creation of webpage, page layouts, forms and formatting of images in HTML. [K2]

CO4: examine the features of Internet Explorer and organization of E-Mail. [K3]

CO5: use table, paragraph, list, text style tags and different components in HTML Form. [K3]

Course Code 20UCSN41	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	L	L	-	-	M	-	-
CO2	L	L	L	-	M	L	-
CO3	M	M	M	M	H	L	-
CO4	M	M	-	-	-	-	-
CO5	M	M	M	L	H	L	-

Semester IV		Hours/Week: 1
Generic Elective Course - 2	**DISASTER MANAGEMENT**	Credit : 1
Course Code **20UGED44**		Internal 100

COURSE OUTCOMES

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

CO 1: recall the basic concepts of Disaster Management. [K1]

CO 2: define the types of disasters, disaster management cycle, and agencies for

disaster management. [K2]

CO 3: explain the types of disaster, its mitigation and management with Examples. [K2]

CO 4: categorising the disasters, phases of disaster management, agencies involved

and the role of IT in disaster management. [K3]

CO 5: Illustrate the causes and effects of manmade and natural disasters, relief,

response, stakeholders and the role of technology in disaster management. [K3]

Course Code 20UGED44	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO 1	H	H	M	M	L	H	M
CO 2	H	M	H	M	L	H	H
CO 3	H	M	H	H	L	H	L
CO 4	H	M	L	H	H	H	H
CO 5	H	M	M	H	H	H	H

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Semester V	DATABASE MANAGEMENT SYSTEM CONCEPTS	Hours/Week: 5	
Core Course 6		Credits: 5	
Course Code 20UCSC51		Internal 25	External 75

COURSE OUTCOMES

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

CO1: identify the need, features, architecture and concepts of database systems, database models and database definition. [K1]

CO2: describe the principles of relational database design, transaction, concurrency control and recovery mechanism. [K2]

CO3: demonstrate database design using E-R model and normalization techniques, database operations using relational algebra and SQL. [K3]

CO4: examine the goodness of the database design using various Normal Forms, the effectiveness of various relational algebra operations using SQL and ACID properties of a transaction. [K4]

CO5: appraise the concepts of database management systems to solve any real database application. [K5]

Course Code 20UCSC51	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	PSO 6	PSO 7
CO1	M	L	H	L	L	L	M	M	L	-
CO2	M	H	H	L	M	M	M	H	L	-
CO3	H	H	M	M	H	M	H	M	L	-
CO4	H	M	M	M	L	H	H	H	M	-
CO5	H	H	M	H	H	H	H	H	M	L

Semester V	DATABASE MANAGEMENT SYSTEM CONCEPTS	Hours/Week: 5	
Core Course 6		Credits: 5	
Course Code 20UCSC51N		Internal 25	External 75

COURSE OUTCOMES

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

CO1: identify the need, features, architecture and concepts of database systems, database models and database definition. [K1]

CO2: describe the principles of relational database design, transaction, concurrency control recovery mechanism and data ethics through authorization. [K2]

CO3: demonstrate database design using E-R model and normalization techniques, database operations using relational algebra and SQL. [K3]

CO4: examine the goodness of the database design using various Normal Forms, the effectiveness of various relational algebra operations using SQL and ACID properties of a transaction. [K4]

CO5: appraise the concepts of database management systems to solve any real Database application. [K5]

Course Code 20UCSC51N	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	PSO 6	PSO 7
CO1	M	L	H	L	L	L	M	M	M	-
CO2	M	H	H	L	M	M	M	H	M	M
CO3	H	H	M	M	H	M	H	M	M	-
CO4	H	M	M	M	L	H	H	H	L	-
CO5	H	H	M	H	H	H	H	H	L	L

Semester V		Hours/Week: 5	
Core Course 7	**COMPUTER ALGORITHMS**	Credits: 5	
Course Code 20UCSC52		Internal 25	External 75

COURSE OUTCOMES

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

CO1: discuss various algorithmic design techniques. [K1]

CO2: describe the concepts of asymptotic analysis of algorithms, Divide and Conquer, Greedy Approach, Dynamic Programming and Backtracking techniques. [K2]

CO3: solve the problems like sorting, searching, finding shortest paths, constructing Minimum Spanning Tree and n-Queens with suitable algorithms. [K3]

CO4: analyse the complexity of algorithms using asymptotic analysis and compare algorithms used in solving similar problems. [K4]

CO5: select an appropriate technique and procedure for solving a given problem in an efficient manner. [K5]

Course Code 20UCSC52	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	PSO 6	PSO 7
CO1	M	-	M	M	-	-	M	-	-	-
CO2	M	L	H	H	-	-	H	-	-	-
CO3	H	H	H	H	H	-	H	L	L	-
CO4	H	H	H	H	H	H	H	-	-	-
CO5	H	H	-	-	L	H	M	-	-	-

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VIRUDHUNAGAR – 626 001

Semester V	COMPUTER NETWORKS	Hours/Week: 5	
Core Course 8		Credits: 5	
Course Code 20UCSC53		Internal 25	External 75

COURSE OUTCOMES

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

CO1: describe the Computer Network basics, architecture, functions and protocols of layers of ISO/OSI Reference Model. [K1]

CO2: discuss the architecture of Computer Network, design issues, services, applications and protocols of layers. [K2]

CO3: choose appropriate media for data transmission, routing algorithms, error handling methods and protocols for data transmission. [K3]

CO4: compare connectionless and connection oriented service, design issues, protocols and services of layers, routing algorithms and compression techniques. [K4]

CO5: evaluate error correction, error detection, framing methods, the importance of routing algorithms and domain name system. [K5]

Course Code 20UCSC53	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	PSO 6	PSO 7
CO1	M	L	M	-	L	-	M	-	-	-
CO2	H	L	M	L	L	M	M	M	-	-
CO3	H	L	M	L	M	M	M	M	-	-
CO4	H	M	M	L	M	H	M	M	-	-
CO5	H	M	M	L	M	H	M	M	-	-

Semester V	COMPUTER NETWORKS	Hours/Week: 5
Core Course 8		Credits: 5
Course Code 20UCSC53N		Internal 25 | External 75

COURSE OUTCOMES

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

CO1: describe the Computer Network basics, architecture, functions and protocols of layers Of ISO/OSI Reference Model. [K1]

CO2: discuss the architecture of Computer Network, design issues, services, applications and protocols of layers. [K2]

CO3: choose appropriate media for data transmission, routing algorithms, error handling methods, protocols for data transmission and prevent from cyber-attacks. [K3]

CO4: compare connectionless and connection oriented service, design issues, protocols and services of layers, routing algorithms and compression techniques. [K4]

CO5: evaluate error correction, error detection, framing methods, the importance of routing algorithms and domain name system. [K5]

Course Code 20UCSC53N	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	PSO 6	PSO 7
CO1	M	L	M	-	L	-	M	-	-	-
CO2	H	L	M	L	L	M	M	M	-	-
CO3	H	L	M	L	M	M	M	M	-	H
CO4	H	M	M	L	M	H	M	M	-	-
CO5	H	M	M	L	M	H	M	M	-	-

Semester V	DATABASE MANAGEMENT SYSTEMS LAB	Hours/Week: 5	
Core Course Practical V		Credits: 2	
Course Code 20UCSC51P		Internal 40	External 60

COURSE OUTCOMES

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

CO1:   write SQL statements to create and manipulate tables using DDL and DML and display using DQL statements. [K3]

CO2:   write PL/SQL programs using functions, procedures, Exceptions, cursors and Triggers and user-interactive programs using any script language. [K3]

CO3:   enter and execute programs for different database and interactive user inputs. [K3]

CO4:   generate the results and prepare the output in the required format. [K3]

CO5:   examine the results of database query statements in various environments such as Command prompt, admin window and user-interactive programs. [K4]

Course Code 20UCSC51P	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	PSO 6	PSO 7
CO1	H	H	L	M	H	M	M	L	L	M
CO2	H	H	M	M	H	M	M	M	L	L
CO3	L	H	L	L	L	L	L	L	L	-
CO4	L	L	H	L	L	L	L	L	L	-
CO5	H	H	H	M	H	H	M	H	L	-

Semester V	INTRODUCTION TO MATLAB AND DIGITAL IMAGE PROCESSING	Hours/Week: 4	
DSEC 1		Credits: 4	
Course Code 20UCSE51		Internal 25	External 75

COURSE OUTCOMES

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

CO1: outline the MATLAB window, multi-dimensional data, operators and control structures, handling of files, functions and image processing using MATLAB. [K1]

CO2: describe arrays, matrices, 2D plots, the representation and manipulation of images in MATLAB. [K2]

CO3: manipulate the data using scripts, built-in and user-defined functions and to improve the images using filtering techniques. [K3]

CO4: discriminate different types of plots and the outputs obtained from enhancement and edge-detection methods for colour and grey images. [K4]

CO5: determine the appropriate plot to visualize data and the methods to filter and enhance the image. [K5]

Course Code 20UCSE51	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	PSO 6	PSO 7
CO1	H	M	L	L	M	L	L	M	-	-
CO2	H	H	L	M	M	M	L	H	-	-
CO3	H	M	M	H	H	H	M	H	-	-
CO4	H	H	M	H	H	H	M	H	L	L
CO5	H	L	L	H	H	H	M	H	L	L

Semester V	INTRODUCTION TO MATLAB AND DIGITAL IMAGE PROCESSING	Hours/Week: 4	
DSEC 1		Credits: 4	
Course Code 20UCSE51N		Internal 25	External 75

COURSE OUTCOMES

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

CO1:   outline the MATLAB window, multi-dimensional data, operators and control structures, handling of files, functions and image processing using MATLAB. [K1]

CO2:   describe arrays, matrices and 2D plots in MATLAB, the acquisition of images and representation of images in MATLAB. [K2]

CO3:   manipulate the data using scripts, built-in and user-defined functions in MATLAB and to apply various filtering techniques on images. [K3]

CO4:   discriminate different types of plots in MATLAB and various image file formats and arithmetic and logical image processing operations. [K4]

CO5:   determine the appropriate plot to visualize data and suitable methods to enhance quality of an image. [K5]

Course Code 20UCSE51N	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	PSO 6	PSO 7
CO1	H	M	L	L	M	L	L	M	-	-
CO2	H	H	L	M	M	M	L	H	-	-
CO3	H	M	M	H	H	H	M	H	-	-
CO4	H	H	M	H	H	H	M	H	L	L
CO5	H	L	L	H	H	H	M	H	L	L

Semester V		Hours/Week: 4	
DSEC 1	**ASP.NET PROGRAMMING**	Credits: 4	
Course Code 20UCSE52		Internal 25	External 75

COURSE OUTCOMES

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

CO1: describe .NET framework, visual studio, web forms and controls, data access, data binding, XML concepts, Master page creation and Site Map. [K1]

CO2: discuss ASP.NET code behind web form, web controls and data controls, ADO Data access, Master page and Site Map. [K2]

CO3: determine the controls to be used, ADO.NET connection with SQL and method of accessing data in ASP.NET programs. [K3]

CO4: examine ASP.NET controls, interaction between ASP.NET and XML, SQL statements to create and manipulate the database. [K4]

CO5: choose appropriate validation controls, SQL statements and XML data file to build dynamic web applications. [K5]

Course Code 20UCSE52	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	PSO 6	PSO 7
CO1	H	-	H	M	-	-	M	-	-	-
CO2	H	M	M	H	-	-	H	-	-	-
CO3	H	H	M	H	L	-	H	M	L	H
CO4	H	H	M	H	M	H	H	M	-	-
CO5	M	L	-	-	L	H	M	L	-	-

Semester V		MULTIMEDIA	Hours/Week: 4	
DSEC 1			Credits: 4	
Course Code 20UCSE53			Internal 25	External 75

COURSE OUTCOMES

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

CO1:   discuss building blocks of Multimedia. [K1]

CO2:   describe the components of Multimedia, types of compression techniques and Multimedia authoring tools. [K2]

CO3:   use appropriate tools for design, creation and development of Multimedia. [K3]

CO4:   analyse the essential features of text, graphics, images, video, file formats and color models. [K4]

CO5:   evaluate existing Multimedia projects based on media quality. [K5]

Course Code 20UCSE53	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	PSO 6	PSO 7
CO1	H	H	L	M	M	M	M	M	L	-
CO2	H	H	L	M	M	H	M	M	L	-
CO3	H	H	M	M	M	M	H	H	L	L
CO4	H	H	H	M	H	H	H	H	M	M
CO5	H	H	H	H	H	H	H	H	H	H

Semester V		Hours/Week: 4	
DSEC 2 Practical I	**MATHEMATICAL APPLICATIONS LAB**	Credits: 2	
Course Code 20UCSE51P		Internal 40	External 60

COURSE OUTCOMES

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

CO1:   write the formula, input and algorithm for the specified problem. [K3]

CO2:   implement the algorithm in MATLAB. [K3]

CO3:   enter and execute the MATLAB code with proper input. [K3]

CO4:   record and generate the output in required format. [K3]

CO5:   analyse the actual output with the expected output. [K4]

Course Code 20UCSE51P	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	PSO 6	PSO 7
CO1	H	M	H	H	H	L	L	L	L	L
CO2	H	H	M	M	H	L	L	M	-	L
CO3	M	H	L	-	L	-	-	-	-	-
CO4	L	-	-	-	-	-	-	-	-	-
CO5	H	M	L	H	L	M	-	L	L	L

Semester V		Hours/Week:4	
DSEC 2 Practical I	**ASP.NET PROGRAMMING LAB**	**Credits: 2**	
Course Code 20UCSE52P		**Internal 40**	**External 60**

COURSE OUTCOMES

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

CO1: write the controls used in the ASP.NET programs with their property values. [K3]

CO2: design web applications using ASP.NET server controls and database. [K3]

CO3: enter and execute ASP.NET programs with appropriate tools. [K3]

CO4: publish web pages and prepare record with ASP.NET programs. [K3]

CO5: select the controls that suit an application and use them in web pages built with ASP.NET programs. [K4]

Course Code 20UCSE52P	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	PSO 6	PSO 7
CO1	H	H	M	M	M	-	H	M	H	-
CO2	H	H	M	M	M	-	H	H	H	-
CO3	H	H	H	M	M	-	M	H	H	-
CO4	H	H	H	M	M	-	M	H	H	-
CO5	H	H	H	M	H	H	L	H	M	-

Semester V		Hours/Week: 4	
DSEC 2 Practical I	**MULTIMEDIA LAB**	**Credits: 2**	
Course Code 20UCSE53P		**Internal 40**	**External 60**

COURSE OUTCOMES

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

CO1:   implement text and image effects in a multimedia project. [K3]

CO2:   develop multimedia applications with audio, video and textual multimedia elements. [K3]

CO3:   execute multimedia programs using ActionScript. [K3]

CO4:   prepare record with procedures for designing multimedia applications. [K3]

CO5:   examine the proper usage of components in multimedia programs. [K4]

Course Code 20UCSE53P	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	PSO 6	PSO 7
CO1	H	H	L	M	M	M	M	M	L	-
CO2	H	H	L	M	M	H	M	M	L	-
CO3	H	H	M	M	M	M	H	H	L	L
CO4	H	H	H	M	H	H	H	H	M	M
CO5	H	H	H	H	H	H	H	H	H	H

Semester V		0 Hour
Core Course 9	**PROJECT**	Credits: 1
Course Code 20UCSC5PR		Internal : 100 Marks 60

COURSE OUTCOMES

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

CO1 : determine problem for the project by surveying variety of domains of Computer Science. [K3]

CO2 : perform requirement analysis and identify design methodologies based on the theoretical knowledge gained. [K3]

CO3 : apply advanced programming techniques to implement a solution for the problem. [K3]

CO4 : analyse the outcome of the project using suitable tools. [K4]

CO5 : assess the project work based on world of work and societal needs. [K5]

Course Code 20UCSC5PR	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	PSO 6	PSO 7
CO1	H	H	H	M	M	L	M	M	M	M
CO2	H	H	H	M	H	L	M	M	M	M
CO3	H	H	M	H	H	M	H	M	M	M
CO4	H	H	H	H	H	H	H	M	M	M
CO5	H	H	H	H	H	H	H	M	M	H

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VIRUDHUNAGAR - 626 001

Semester V		C and C++ Aptitude	Credits: 2
Extra Credit Course 1			
Course Code 20UCSO51			Internal Marks 100 External 60

COURSE OUTCOMES

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

CO1:   describe data types, expressions and user defined functions in C.

CO2:   explore the merits of object oriented programming

CO3:   discuss dynamic memory management techniques using pointers, constructors, destructors.

CO4:   use virtual functions and templates efficiently

CO5:   analyse an object oriented concept that suits an application

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Semester V	INTRODUCTION TO MICROCONTROLLERS	Credits: 2
Extra Credit Course 2		
Course Code 20UCSO52		Internal Marks 100 External 60

COURSE OUTCOMES

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

CO1: describe architecture and interfaces of microcontrollers.

CO2: explore the addressing modes, instructions, pin diagrams of microcontrollers and their interfaces.

CO3: use timers, microcontrollers and their interfaces in different applications.

CO4: select the interface for a particular domain.

CO5: appraise PIC and ARM microcontrollers.

Semester V		Hours/Week: 2	
PART IV	**ENVIRONMENTAL STUDIES**	**Credits: 1**	
Course Code 20UGES51		**Internal 100**	**External -**

COURSE OUTCOMES

On completion of the course, students will be able to

CO1 : State the social aspects of the environment, the present condition of the earth and
the impact of human activities locally and globally. [K1]

CO2 : Explain the biodiversity conservation, environmental hazards and current possible
disasters. [K2]

CO3 : Describe the need for sustainable development. [K2]

CO4 : Solve the environmental associated problems. [K3]

CO5 : Identify environmental legislations and management strategies. [K3]

Course Code 20UGES51	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
CO 1	H	H	L	L	L	-	L
CO 2	H	H	L	L	L	-	-
CO 3	H	H	L	L	L	-	-
CO 4	H	H	H	H	L	-	-
CO 5	H	H	H	H	L	-	H

Semester VI	MOBILE APPLICATIONS DEVELOPMENT	Hours/Week: 5	
Core Course 10		Credits: 5	
Course Code 20UCSC61		Internal 25	External 75

COURSE OUTCOMES

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

CO1:   recognize the basic android widgets and other Android application components. [K1]

CO2:   describe the attributes and methods of Android widgets, layouts, dialogs, menus and databases. [K2]

CO3:   use android widgets, dialogs, menus, databases, content providers and animations in Android programs. [K3]

CO4:   classify widgets, layouts and other significant components that can be used in Android applications. [K4]

CO5:   choose appropriate widgets, layouts, menus, resources, dialogs and database queries for creating Android applications. [K5]

Course Code 20UCSC61	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	PSO 6	PSO 7
CO1	H	H	M	M	H	M	H	H	-	-
CO2	H	H	M	M	H	M	H	H	-	-
CO3	H	H	M	H	H	M	H	H	M	-
CO4	H	H	M	H	H	H	H	H	M	M
CO5	H	H	M	H	H	H	H	H	M	H

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Semester VI		Hours/Week: 5	
Core Course 11		Credits: 5	
Course Code 20UCSC62	**OPERATING SYSTEM CONCEPTS**	Internal 25	External 75

COURSE OUTCOMES

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

CO1: describe role of operating system, its services and structure. [K1]

CO2: explore the concept of deadlock, process management, memory management, file management and disk management. [K2]

CO3: determine scheduling algorithms, deadlock avoidance algorithms, memory management techniques and file allocation methods suitable for different scenarios. [K3]

CO4: analyse the various functions of operating system. [K4]

CO5: compare various views of operating system, scheduling algorithms, virtual memory management techniques and file allocation methods. [K5]

Course Code 20UCSC62	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	PSO 6	PSO 7
CO1	H	-	M	M	H	-	H	H	-	-
CO2	H	-	M	M	H	-	H	H	-	-
CO3	H	M	H	H	H	L	H	H	L	-
CO4	H	H	H	H	H	M	H	H	L	M
CO5	H	M	H	H	H	M	H	H	L	M

Semester VI	**INTRODUCTION TO DATA MINING**	Hours/Week: 5	
Core Course 12		Credits: 5	
Course Code 20UCSC63		Internal 25	External 75

COURSE OUTCOMES

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

CO1: recognize the fundamental concepts of Data Warehousing, Data Mining techniques, web mining, Data Cube Implementation and OLAP. [K1]

CO2: interpret the working of various data mining algorithms, data warehousing , data pre-processing and functions of search engines. [K2]

CO3: implement data pre-processing and Data Mining algorithms in real time application, data cube operations, ranking of web pages and query mining. [K3]

CO4: compare various frequent pattern generation algorithms, classification algorithms, clustering methods, web data mining. [K4]

CO5: assess various types of data, outlier detection methods, Data Mining techniques and ranking of web pages. [K5]

Course Code 20UCSC63	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	PSO 6	PSO 7
CO1	H	-	H	M	-	-	M	L	-	-
CO2	H	-	M	M	-	-	M	M	-	-
CO3	H	M	M	H	L	H	H	H	L	M
CO4	H	L	M	H	L	H	H	H	-	M
CO5	M	L	M	H	L	H	H	H	-	M

Semester VI	MOBILE APPLICATIONS DEVELOPMENT LAB	Hours/Week: 4	
Core Course Practical VI		Credits: 2	
Course Code 20UCSC61P		**Internal** 40	**External** 60

COURSE OUTCOMES

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

CO1: implement layouts and widgets in Android projects. [K3]

CO2: develop Android applications with Spinner, Date/TimePicker, menus, ListView, GridView. [K3]

CO3: execute Android projects using intent, database. [K3]

CO4: prepare record with procedures for designing Mobile applications. [K3]

CO5: examine the proper usage of layouts, widgets, listeners and Android components in Android projects. [K4]

Course Code 20UCSC61P	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	PSO 6	PSO 7
CO1	H	H	L	L	H	M	M	M	L	M
CO2	H	H	L	L	H	M	H	M	L	M
CO3	H	H	M	L	H	M	H	M	L	H
CO4	H	H	H	M	H	M	H	M	M	M
CO5	H	H	M	M	H	H	H	H	H	H

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Semester VI		Hours/Week: 5	
DSEC 3	**COMPUTER GRAPHICS**	Credits: 4	
Course Code 20UCSE61		Internal 25	External 75

COURSE OUTCOMES

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

CO1: enumerate the graphical output devices, uses of computer graphics, properties and views of graphical objects, co-ordinate systems and Graphical User Interface. [K1]

CO2: discuss the applications of Computer Graphics, graphical devices, output primitives and their attributes, adjustment of the graphical objects to fit the view and interactive input methods. [K2]

CO3: implement various graphical object creation, attribute setting and manipulation algorithms. [K3]

CO4: analyse different graphical devices, geometrical transformations, clipping methods and interactive picture construction techniques. [K4]

CO5: assess data structures, techniques and algorithms used in computer graphics. [K5]

Course Code 20UCSE61	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	PSO 6	PSO 7
CO1	H	M	H	H	H	L	H	L	-	-
CO2	H	M	H	H	H	L	H	L	-	-
CO3	H	M	L	H	H	M	H	L	-	-
CO4	H	M	L	H	H	H	H	L	-	-
CO5	H	M	L	H	H	H	H	M	-	-

Semester VI		Hours/Week: 5	
DSEC 3	**INTRODUCTION TO INTERNET OF THINGS**	**Credits: 4**	
Course Code 20UCSE62		**Internal 25**	**External 75**

COURSE OUTCOMES

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

CO1: describe the fundamental concepts, domain specific applications of IoT, physical devices, IoT protocols, design methodology, IoT tools. [K1]

CO2: recognize IoT applications, physical devices used for IoT, types of protocols, IoT tools. [K2]

CO3: demonstrate control structures, functions, arrays in Arduino, Raspberry pi commands, python program on Raspberry pi , design dynamic web application using JavaScript and Mongo DB. [K3]

CO4: compare the different IoT physical devices, endpoints and analyse the IoT web applications and various tools for IoT. [K4]

CO5: assess transducers, sensors, actuators and various IoT protocols. [K5]

Course Code 20UCSE62	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	PSO 6	PSO 7
CO1	H	-	L	L	-	L	H	M	-	-
CO2	H	-	M	M	L	L	M	M	-	-
CO3	H	M	L	L	M	L	M	M	-	-
CO4	H	M	M	M	M	M	M	M	-	L
CO5	H	M	L	M	M	H	L	H	-	M

Semester VI		Hours/Week: 5	
DSEC 3	**INTRODUCTION TO BIG DATA**	Credits: 4	
Course Code 20UCSE63		**Internal 25**	**External 75**

COURSE OUTCOMES

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

CO1: describe Big Data, its sources, architecture, dataset of R, data management and graphs in R. [K1]

CO2: explore Big Data Analytics, Big Data Stack, Dataset management, data manipulation and graph plotting in R. [K2]

CO3: use the Analytics method, data structures and graphs appropriate for domain specific applications. [K3]

CO4: examine the Data Analytics using R. [K4]

CO5: select suitable analytics flow, data management and visualisation methods for an application. [K5]

Course Code 20UCSE63	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	PSO 6	PSO 7
CO1	H	M	M	L	M	M	M	M	-	L
CO2	H	H	H	L	M	M	M	M	-	L
CO3	H	H	H	L	M	H	M	M	-	L
CO4	H	H	H	M	H	H	M	H	-	M
CO5	H	H	H	M	H	H	M	H	-	M

Semester VI		Hours/Week: 4	
DSEC 4 Practical II	**COMPUTER GRAPHICS LAB**	**Credits: 2**	
Course Code 20UCSE61P		**Internal 40**	**External 60**

COURSE OUTCOMES

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

CO1: write C programs for plotting graphics primitives and objects . [K3]

CO2: apply transformation and clipping techniques to graphical objects. [K3]

CO3: execute C programs using built-in graphical functions. [K3]

CO4: prepare record with graphics programs. [K3]

CO5: examine the merits, demerits and space complexity of different graphical algorithms. [K4]

Course Code 20UCSE61P	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	PSO 6	PSO 7
CO1	H	H	H	H	H	M	M	H	M	M
CO2	H	H	H	H	H	M	M	H	H	M
CO3	M	M	M	L	M	-	-	-	-	-
CO4	L	L	M	L	L	-	-	-	-	-
CO5	H	H	H	H	H	H	M	H	H	H

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Semester VI		Hours/Week: 4	
DSEC 4 Practical II	**ANIMATION USING ANIMATE AND MAYA LAB**	**Credits: 2**	
Course Code **20UCSE62P**		**Internal** **40**	**External** **60**

COURSE OUTCOMES

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

CO1: implement the timeline and scenes in a movie. [K3]

CO2: create animation using Tweening and Morphing. [K3]

CO3: explore multi layer animations. [K3]

CO4: prepare record with Flash and MAYA programs using basic animation, multilayer animation, Tween and Marphing. [K3]

CO5: examine implementation of animations using 2D and 3D characters. [K4]

Course Code 20UCSE62P	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	PSO 6	PSO 7
CO1	H	H	H	L	M	-	M	-	-	M
CO2	H	H	H	M	M	-	M	-	-	M
CO3	H	H	H	M	H	-	M	M	-	M
CO4	H	H	H	H	H	-	M	M	-	M
CO5	H	H	M	M	H	-	M	L	-	M

Semester VI		Hours/Week: 4	
DSEC 4 Practical II	**DATA SCIENCE LAB**	**Credits:2**	
Course Code 20UCSE63P		**Internal 40**	**External 60**

COURSE OUTCOMES

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

CO1:   write programs in R using basic concepts like vector, array, matrix and functions. [K3]

CO2:   write R programs to perform statistical analysis on the data and visualize the output. [K3]

CO3:   enter and execute R programs in an IDE with various inputs and sample dataset. [K3]

CO4:   generate results and record outputs in an appropriate format. [K3]

CO5:   analyse the results of the same problem with different procedures and methods. [K4]

Course Code 20UCSE63P	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	PSO 6	PSO 7
CO1	H	H	L	L	H	L	-	-	-	-
CO2	H	H	L	M	H	M	M	M	-	-
CO3	H	H	H	-	-	-	-	-	L	-
CO4	H	H	H	-	-	-	-	-	L	-
CO5	H	H	L	M	H	H	M	M	L	-

Semester VI		Hours/Week: 1 T + 1 P	
SEC 6 Practical IV	**PHP AND MYSQL LAB**	Credits: 2	
Course Code 20UCSS61P		Internal 40	External 60

COURSE OUTCOMES

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

CO1: formulate and write user interactive web pages with necessary validations. [K3]

CO2: design and develop the web pages using databases, COOKIES, and SESSIONS. [K3]

CO3: demonstrate the user interactive webpages with the help of real time inputs. [K3]

CO4: prepare output of interactive web pages and database manipulations. [K3]

CO5: develop web pages for personal and business applications to satisfy real life requirements. [K4]

Course Code 20UCSS61P	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	PSO 6	PSO 7
CO1	H	H	H	H	H	M	M	H	M	M
CO2	H	H	H	H	H	M	M	H	H	M
CO3	M	M	M	L	M	-	-	-	-	-
CO4	L	L	M	L	L	-	-	-	-	-
CO5	H	H	H	H	H	H	M	H	H	H

Semester VI		Hours/Week: 1 T + 1P	
SEC 6 Practical IV	**PYTHON PROGRAMMING LAB**	Credits: 2	
Course Code 22UCSS61P		Internal 40	External 60

COURSE OUTCOMES

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

CO1: write Python Programs for various control structures of Python. [K3]

CO2: data flow chart and write programs for various program structures of Python. [K3]

CO3: demonstrate data representation using List, Tuple, Dictionary, Strings and GUI

   Applications in Python. [K3]

CO4: design object-oriented programs with classes and exception handling mechanism in

   python. [K3]

CO5: explore the uses of Python Programs. [K4]

Course Code 22UCSS61P	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	PSO 6	PSO 7
CO1	H	H	L	M	M	M	M	M	L	-
CO2	H	H	L	M	M	H	M	M	L	-
CO3	H	H	M	M	M	M	H	H	L	L
CO4	H	H	H	M	H	H	H	H	H	M
CO5	H	H	H	H	H	H	H	H	H	H