



## **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 (3<sup>rd</sup> Cycle) by NAAC

**VIRUDHUNAGAR - 626 001**

### **PEOs, POs, PSOs and COs**

#### **B.C.A.**

#### **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)**

**The students will be able to**

**PEO1:** Effectively utilizing their knowledge of computing principles and mathematical theory to develop sustainable solutions to current and future computing problems.

**PEO2:** Graduates are trained to employ modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur.

**PEO3:** Shine as socially committed computer professionals having mutual respect, efficient programming skills and satisfy the needs of society.

<b>Key Components of Mission Statement</b>	<b>Programme Educational Objectives</b>		
	<b>PEO1</b>	<b>PEO2</b>	<b>PEO3</b>
continues development of technical competency	√	√	
train students for careers as IT professionals	√	√	
empower the student in rural communities	√		√

### **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.C.A. Programme, the students will be able to**

**PO1 - *Disciplinary Knowledge***

**PSO 1.a:** Apply the acquired knowledge in computer science and in interdisciplinary fields for successful career and higher studies.

**PSO1.b:** Make use of the technical knowledge in various technology field of computer science to identify the problem, analyze, design and develop the system as the solution to the problem.

**PO2 – *Communication Skills***

**PSO2:** ability to express the computer knowledge by preparing documentation and communicate to the society with effective presentation.

**PO3 – *Scientific Reasoning and Problem Solving***

**PSO3.a:** Apply theoretical foundations of computer applications with emphasis on strong practical training that enable them to solve real world problems related to sustainable environment.

**PSO3.b:** Analyze needed information and/or eliminate extraneous information towards solving contextual problems.

**PO4 – *Critical Thinking and Analytical Reasoning***

**PSO 4.a:** Analyze, sketch and attain the innovative solutions to the problems related to Computer Industry.

**PSO 4.b:** Critically evaluate the software systems and find the optimum solution for the betterment of society.

**PO5 – *Digital Literacy, Self - Directed and Lifelong Learning***

**PSO5:** Utilize modern computing tools, skills and techniques necessary for facing issues in finding software solutions in their career.

**PO6 –*Co-operation/Team Work and Multi-Cultural Competence***

**PSO6:** Apply their leadership qualities, and cooperative spirit to achieve the project targets.

**PO7 –*Moral and Ethical Awareness***

**PSO 7:** Solve and work with a professional context pertaining to ethics, cultural and cyber regulations



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**VIRUDHUNAGAR - 626 001**

<b>Semester I</b>	<b>PROGRAMMING IN C</b>	<b>Hours/Week: 5</b>	
<b>Core Course1</b>		<b>Credits: 4</b>	
<b>Course Code</b> <b>20UCAC11</b>		<b>Internal</b> <b>25</b>	<b>External</b> <b>75</b>

### COURSE OUTCOMES

On successful completion of the course, the learner should be able to

CO1: outline the history of C, model of computer, structure of C, constants,

variables, data types, operators, expression, control statement, input and output operations. [K1]

CO2: understand the concept of top-down modular programming, collection of similar data, group of logically related data, pointers and basic file operations. [K2]

CO3: illustrate the basics of computers, elements of C Programming, management of input and output operations, statements that alter the flow of execution, user defined and derived data types, array, pointer and file handling functions. [K2]

CO4: apply the knowledge of basic structures, operators, expressions, management of input/output operations, control structures, branching, array, user defined functions, structures, dynamic memory allocation, file management. [K3]

CO5: analyze various operators, decision making and iterative statements, homogeneous and heterogeneous data, pointers and files. [K4]

Course Code 20UCAC11	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	H	H	M	-	-	-	-	-	-	-
CO2	H	M	M	M	M	-	-	-	-	-
CO3	M	M	M	H	H	L	L	M	-	-
CO4	M	M	L	M	H	L	L	M	-	-
CO5	-	M	L	-	-	-	-	H	-	-



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VIRUDHUNAGAR - 626 001

Semester I	PROGRAMMING IN C LAB	Hours/Week: 5	
Core Course 2		Credits: 3	
Course Code 20UCAC11P		Internal 40	External 60

### COURSE OUTCOMES

On successful completion of the course, the learners should be able to

CO1: apply the specification of syntax, rules for numerical, constants, variables and data types. [K3]

CO2: write C programs using arrays, operators, decision making/looping statements, functions, structure, pointer and files. [K3]

CO3: execute the programs with required input. [K3]

CO4: prepare the record with the neat output. [K3]

CO5: test program with modification and justify the result. [K4]

Course Code 20UCAC11P	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	H	M	H	-	-	-	-	-	-	-
CO2	H	H	M	M	M	-	-	-	-	L
CO3	M	M	M	H	M	L	L	M	-	-
CO4	M	-	L	M	-	L	L	M	-	-
CO5	-	M	L	-	-	-	-	H	L	-



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Semester I	DISCRETE MATHEMATICS	Hours/Week: 4	
Allied Course 1		Credits: 4	
Course Code 20UCAA11		Internal 25	External 75

### COURSE OUTCOMES

On successful completion of the course, the learners should be able to

CO1: understand the basic concepts of relations, functions, mathematical induction, theory of matrices, graph theory. [K1]

CO2: discuss the types of relations, functions, matrices, graphs with examples. [K2]

CO3: explain proofs of theorems with examples. [K2]

CO4: apply and solve the problems in relations, functions, matrices and graphs. [K3]

CO5: explain the algorithms for problems in relations and functions and point out the solutions using algorithms on graphs. [K4]

Course Code 20UCAA11	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	H	L	H	M	M	L	-
CO2	H	L	H	M	M	L	-
CO3	H	-	L	L	M	L	-
CO4	H	-	M	M	M	L	-
CO5	H	-	M	L	M	L	-



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<b>Semester I</b>	<b>MS-OFFICE LAB</b>	<b>Hours/Week: 2</b>	
<b>Skill Enhancement Course 1</b>		<b>Credits: 2</b>	
<b>Course Code</b> <b>20UCAS11P</b>		<b>Internal</b> <b>40</b>	<b>External</b> <b>60</b>

### COURSE OUTCOMES

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

- CO1: examine the given problem and identify the basic tools and features in MS-Word, MS- Excel, MS-Power Point and MS-Access. [K3]
- CO2: design document using required tools and elements to create professional and academic documents/presentations. [K3]
- CO3: execute the steps to solve real world problems. [K3]
- CO4: present the analysis of data using chart and record effectively. [K3]
- CO5: explain the necessity of tools used and deduce the answers for any queries raised. [K4]

Course Code 20UCAS11P	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	M	H	M	-	-	-	-	-	-	-
CO2	M	H	M	M	H	-	-	-	L	L
CO3	-	H	-	M	-	L	-	M	-	L
CO4	M	H	L	M	H	L	L	M	-	-
CO5	H	M	L	-	-	-	-	H	-	-



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**VIRUDHUNAGAR - 626 001**

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

## COURSE OUTCOMES

On completion of the course, the learners 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]

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





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<b>Semester II</b>	<b>PROGRAMMING IN C++</b>	<b>Hours/Week: 5</b>	
<b>Core Course 3</b>		<b>Credits: 4</b>	
<b>Course Code</b> <b>20UCAC21</b>		<b>Internal</b> <b>25</b>	<b>External</b> <b>75</b>

### COURSE OUTCOMES

On successful completion of the course, the learners should be able to

- CO1: describe the procedural and object oriented paradigm with concepts of stream classes, functions, pointer and inheritance. [K1]
- CO2: list different types of operators and polymorphism. [K2]
- CO3: explain the concepts of object-oriented programming, function, constructor, overloading, inheritance and string class. [K2]
- CO4: make the use of functions, inheritance, virtual function, overloading, Streams, string manipulation, constructor and destructor to solve complex problems. [K3]
- CO5: analyze various ideas related with the function, string, inheritance and constructor for the real time application. [K4]

Course Code 20UCAC21	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	H	H	M	-	-	-	-	-	-	-
CO2	H	M	M	M	M	-	-	-	-	-
CO3	M	M	M	H	H	L	L	M	-	-
CO4	M	M	L	M	H	L	L	M	-	-
CO5	-	M	L	-	-	-	-	H	-	-



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<b>Semester II</b>	<b>PROGRAMMING IN C++ LAB</b>	<b>Hours/Week: 5</b>	
<b>Core Course 4</b>		<b>Credits: 3</b>	
<b>Course Code</b> <b>20UCAC21P</b>		<b>Internal</b> <b>40</b>	<b>External</b> <b>60</b>

### COURSE OUTCOMES

On successful completion of the course, the learners should be able to

CO1: make use of classes, objects, methods, functions and constructors. [K3]

CO2: write programs using C++ features such as composition of objects, Operator overloading, function overloading, virtual functions, inheritance Polymorphism. [K3]

CO3: execute the programs with required input. [K3]

CO4: present output effectively and prepare the record with the neat output. [K3]

CO5: test program with modification and justify the result. [K4]

Course Code 20UCAC21P	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	H	M	H	-	-	-	-	-	-	-
CO2	H	M	M	M	M	-	-	-	-	L
CO3	M	M	M	H	M	L	L	M	-	-
CO4	M	L	L	M	-	L	L	M	-	-
CO5	-	L	L	-	-	-	-	H	L	-



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<b>Semester II</b>	<b>PROGRAMMING IN C++ LAB</b>	<b>Hours/Week: 5</b>	
<b>Core Course 4</b>		<b>Credits: 3</b>	
<b>Course Code</b> <b>20UCAC21PN</b>		<b>Internal</b> <b>40</b>	<b>External</b> <b>60</b>

### COURSE OUTCOMES

On successful completion of the course, the learners should be able to

CO1: make use of classes, objects, methods, functions and constructors. [K3]

CO2: write programs using C++ features such as composition of objects, operator overloading, function overloading, inheritance Polymorphism for developing skills. [K3]

CO3: execute the programs with required input. [K3]

CO4: present output effectively and prepare the record with the neat output [K3]

CO5: test program with modification and justify the result. [K4]

Course Code	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
<b>20UCAC21PN</b>										
<b>CO1</b>	<b>H</b>	<b>M</b>	<b>H</b>	-	-	-	-	-	-	-
<b>CO2</b>	<b>H</b>	<b>M</b>	<b>M</b>	<b>M</b>	<b>M</b>	-	-	-	-	<b>L</b>
<b>CO3</b>	<b>M</b>	<b>M</b>	<b>M</b>	<b>H</b>	<b>M</b>	<b>L</b>	<b>L</b>	<b>M</b>	-	-
<b>CO4</b>	<b>M</b>	<b>L</b>	<b>L</b>	<b>M</b>	-	<b>L</b>	<b>L</b>	<b>M</b>	-	-
<b>CO5</b>	-	<b>L</b>	<b>L</b>	-	-	-	-	<b>H</b>	<b>L</b>	-



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VIRUDHUNAGAR - 626 001

Semester II	RESOURCE MANAGEMENT TECHNIQUES	Hours/Week: 4	
Allied Course 2		Credits: 4	
Course Code 20UCAA21		Internal 25	External 75

### COURSE OUTCOMES

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

CO1: define the basic concepts of operations research, linear programming problem, assignment problem and transportation problem. [K1]

CO2: discuss models, phases, characteristics of operations research, and mathematical formulation in linear programming problem, dual, assignment problem and transportation problem. [K2]

CO3: explain various methods of linear programming problem, assignment problem and transportation problem. [K2]

CO4: solve the problems in linear programming problem, assignment problem and transportation problem. [K3]

CO5: explain the algorithms for problems in linear programming problem, assignment problem and transportation problem. [K4]

Course Code 20UCAA21	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	H	L	H	M	M	H	-
CO2	H	-	H	M	M	M	-
CO3	H	L	H	L	M	M	-
CO4	H	-	H	M	M	M	-
CO5	H	-	H	M	M	M	-



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Semester II	PHOTOSHOP LAB	Hours/Week: 2	
SEC 2		Credits: 2	
Course Code 20UCAS21P		Internal 40	External 60

### COURSE OUTCOMES

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

CO1: examine the given design problem, identify the basic tools and features in Photoshop. [K3]

CO2: design Photoshop document implementing the required tools and elements to get a good photo effect. [K3]

CO3: execute the steps to produce required output. [K3]

CO4: present output effectively and prepare the record. [K3]

CO5: explain the necessity of tools used, deduce the changes to be incorporated over the developed application using the acquired knowledge. [K4]

Course Code 20UCAS21P	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	M	H	L	-	-	-	-	-	-	-
CO2	H	M	M	M	M	-	-	-	L	L
CO3	-	H	-	M	H	-	L	M	-	L
CO4	H	H	L	M	-	L	L	M	-	-
CO5	H	M	L	-	-	-	-	H	-	-



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Semester II	PHOTOSHOP LAB	Hours/Week: 2	
SEC 2		Credits: 2	
Course Code 20UCAS21PN		Internal 40	External 60

### COURSE OUTCOMES

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

CO1: examine the given design problem, identify the basic tools and features In Photoshop. [K3]

CO2: develop skill, design Photoshop document implementing the required tools and elements to get a good photo effect. [K3]

CO3: execute the steps to produce required output. [K3]

CO4: present output effectively and prepare the record.\ [K3]

CO5: explain the necessity of tools used, deduce the changes to be incorporated over the developed application using the acquired knowledge. [K4]

Course Code 20UCAS21PN	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	M	H	L	-	-	-	-	-	-	-
CO2	H	M	M	M	M	-	-	-	L	L
CO3	-	H	-	M	H	-	L	M	-	L
CO4	H	H	L	M	-	L	L	M	-	-
CO5	H	M	L	-	-	-	-	H	-	-



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<b>Semester II</b>	<b>DIGITAL LOGIC</b>	<b>Hours/Week: 2</b>	
<b>SEC 3</b>		<b>Credits: 2</b>	
<b>Course Code</b> <b>20UCAS22</b>		<b>Internal</b> <b>40</b>	<b>External</b> <b>60</b>

### COURSE OUTCOMES

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

CO1: define number system, codes, basics of Boolean algebra. [K1]

CO2: describe the concept of arithmetic circuits, combinational circuits, flip flops, counters and registers. [K1]

CO3: demonstrate number systems, codes, Boolean algebra, K-map, binary arithmetic, combinational and sequential circuits. [K2]

CO4: solve number conversions and Boolean expressions, apply gates to design, combinational and sequential circuits. [K3]

CO5: compare and analyze number systems, codes, Boolean algebra, combinational and sequential circuits. [K4]

Course Code 20UCAS22	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	M	-	M	-	-	-	-	-	-	-
CO2	H	H	M	-	M	-	-	-	-	-
CO3	-	H	L	M	M	L	-	M	-	-
CO4	H	-	L	H	H	L	L	M	-	-
CO5	M	M	L	-	-	-	-	M	-	-



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**VIRUDHUNAGAR - 626 001**

<b>Semester II</b>	<b>DIGITAL LOGIC</b>	<b>Hours/Week: 2</b>	
<b>SEC3</b>		<b>Credits: 2</b>	
<b>Course Code 20UCAS22N</b>		<b>Internal 40</b>	<b>External 60</b>

### COURSE OUTCOMES

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

CO1: define number system, codes, basics of Boolean algebra. [K1]

CO2: describe the concept of logic gates, arithmetic circuits and combinational circuits. [K1]

CO3: demonstrate number systems, codes, boolean algebra, K-map, logic gates, binary arithmetic, Combinational circuits. [K2]

CO4: solve number conversions and boolean expressions, apply gates to design, combinational circuits. [K3]

CO5: compare and analyze number systems, codes, boolean algebra, logic gates, combinational circuits. [K4]

Course Code 20UCAS22N	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	M	-	M	-	-	-	-	-	-	-
CO2	H	H	M	-	M	-	-	-	-	-
CO3	-	H	L	M	M	L	-	M	-	-
CO4	H	-	L	H	H	L	L	M	-	-
CO5	M	M	L	-	-	-	-	M	-	-





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VIRUDHUNAGAR - 626 001

Semester III	DATA STRUCTURES	Hours/Week: 4	
Core Course 5		Credits: 4	
Course Code 20UCAC31		Internal 25	External 75

### COURSE OUTCOMES

On successful completion of the course, the learners should be able to

CO1: gain knowledge on the basis of data structures, linear data structures array, linked list, stack, queue and non-linear data structures tree and graph. [K1]

CO2: understand the concepts of storage representation and operations of linear and non-linear data structures. [K2]

CO3: make use of the various data structures for solving real time problem. [K3]

CO4: analyze various linear & non-linear data structures and its operations. [K4]

CO5: choose a data structure for solving a given problem and evaluate the complexity. [K5]

Course Code 20UCAC31	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	H	-	H	-	L	-	-	-	-	-
CO2	H	-	H	-	M	-	-	-	-	-
CO3	H	H	M	H	M	L	L	M	-	L
CO4	M	M	M	-	M	M	L	L	-	-
CO5	M	H	L	L	-	-	-	M	-	L



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VIRUDHUNAGAR - 626 001

Semester III	DATA STRUCTURES	Hours/Week: 4	
Core Course 5		Credits: 4	
Course Code 20UCAC31N		Internal 25	External 75

### COURSE OUTCOMES

On successful completion of the course, the learners should be able to

CO1: gain knowledge on the basis of data structures, linear data structures array, linked list, stack, queue and non-linear data structures tree. [K1]

CO2: understand the concepts of storage representation and operations of linear and non-linear data structures. [K2]

CO3: make use of the various data structures for solving real time problems. [K3]

CO4: analyze various linear & non-linear data structures and its operations. [K4]

CO5: choose a data structure for solving a given problem and evaluate the complexity. [K5]

Course Code 20UCAC31N	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	H	-	H	-	L	-	-	-	-	-
CO2	H	-	H	-	M	-	-	-	-	-
CO3	H	H	M	H	M	L	L	M	-	L
CO4	M	M	M	-	M	M	L	L	-	-
CO5	M	H	L	L	-	-	-	M	-	L



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**VIRUDHUNAGAR - 626 001**

<b>Semester III</b>	<b>OPERATING SYSTEMS</b>	<b>Hours/Week: 4</b>	
<b>Core Course 6</b>		<b>Credits: 3</b>	
<b>Course Code</b> <b>20UCAC32</b>		<b>Internal</b> <b>25</b>	<b>External</b> <b>75</b>

### COURSE OUTCOMES

On successful completion of the course, the learners should be able to

CO1: describe the concepts of process, deadlocks, memory management, virtual memory and file system, examine computer system structures. [K1]

CO2: outline the process and memory management policies, explain file system, disk and I/O structure. [K2]

CO3: identify memory, disk and swap space management, solve the problems to achieve process synchronization. [K3]

CO4: explain how the file systems are implemented, classify CPU scheduling and Disk scheduling, examine deadlocks. [K4]

CO5: measure process scheduling, summarize paging and segmentation, assess page replacement algorithms and disk scheduling algorithms. [K5]

Course Code 20UCAC32	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	H	H	M	-	-	-	-	-	-	-
CO2	-	M	M	M	M	-	-	-	-	-
CO3	M	M	M	H	H	L	L	M	-	-
CO4	M	-	L	M	H	L	L	M	-	-
CO5	-	M	L	-	-	-	-	H	-	-



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**VIRUDHUNAGAR - 626 001**

<b>Semester III</b>	<b>OPERATING SYSTEMS</b>	<b>Hours/Week: 4</b>	
<b>Core Course 6</b>		<b>Credits: 3</b>	
<b>Course Code</b> <b>20UCAC32N</b>		<b>Internal</b> <b>25</b>	<b>External</b> <b>75</b>

### COURSE OUTCOMES

On successful completion of the course, the learners should be able to

CO1: describe the concepts of process, deadlocks, memory management, virtual memory, file system and I/O systems, examine computer system structures. [K1]

CO2: outline the process and memory management policies; explain file system, disk And I/O systems. [K2]

CO3: identify memory, disk and swap space management and I/O systems; solve the problems to achieve process synchronization. [K3]

CO4: explain how the file systems are implemented, classify CPU scheduling and Disk scheduling, examine deadlocks. [K4]

CO5: measure process scheduling, summarize paging and segmentation, assess page replacement algorithms and disk scheduling algorithms. [K5]

Course Code 20UCAC32N	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
<b>CO1</b>	<b>H</b>	<b>H</b>	<b>M</b>	-	-	-	-	-	-	-
<b>CO2</b>	-	<b>M</b>	<b>M</b>	<b>M</b>	<b>M</b>	-	-	-	-	-
<b>CO3</b>	<b>M</b>	<b>M</b>	<b>M</b>	<b>H</b>	<b>H</b>	<b>L</b>	<b>L</b>	<b>M</b>	-	-
<b>CO4</b>	<b>M</b>	-	<b>L</b>	<b>M</b>	<b>H</b>	<b>L</b>	<b>L</b>	<b>M</b>	-	-
<b>CO5</b>	-	<b>M</b>	<b>L</b>	-	-	-	-	<b>H</b>	-	-



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VIRUDHUNAGAR - 626 001

Semester III	DATA STRUCTURES USING C++ LAB	Hours/Week: 4	
Core Course 7		Credits: 2	
Course Code 20UCAC31P		Internal 40	External 60

### COURSE OUTCOMES

On successful completion of the course, the learners should be able to

CO1: illustrate the arrays for solving real life problems. [K3]

CO2: demonstrate programs using stack, queue, linked list for data manipulation using array and linked list concept. [K3]

CO3: show the skill of working with sorting and searching techniques. [K3]

CO4: apply the usage of stack and queue by developing a program with neat output. [K3]

CO5: identify constructive techniques for building binary tree and binary search tree with modification. [K4]

Course Code 20UCAC31P	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	H	M	H	-	L	M	M	-	-	-
CO2	H	H	L	-	-	M	-	-	M	-
CO3	M	H	L	L	-	M	-	-	-	M
CO4	H	M	-	-	-	-	M	L	L	-
CO5	H	M	M	-	L	M	-	-	L	L



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VIRUDHUNAGAR - 626 001

Semester III	NUMERICAL APTITUDE	Hours/Week: 4	
Allied Course 3		Credits: 4	
Course Code 20UCAA31		Internal 25	External 75

### COURSE OUTCOMES

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

CO1: observe the real life situations and relate it with aptitude problems. [K1]

CO2: discuss the concept of problems on numbers, ages, ratio, time and work, simple interest. [K2]

CO3: express the practical problem using the fundamentals of mathematics. [K2]

CO4: apply the knowledge gained in aptitude and enhance their knowledge for successful career. [K3]

CO5: estimate the numerical aptitude problems and get optimum solution for the betterment of humanity. [K4]

Course Code 20UCAA31	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	H	L	H	H	L	M	-
CO2	H	L	H	M	L	M	-
CO3	H	-	H	M	L	M	-
CO4	H	-	H	L	L	M	-
CO5	H	-	H	M	L	M	-



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VIRUDHUNAGAR - 626 001

<b>Semester III</b>	<b>FUNDAMENTALS OF COMPUTERS</b>	<b>Hours/Week: 2</b>	
<b>Non Major Elective Course -1</b>		<b>Credits: 2</b>	
<b>Course Code 20UCAN31</b>		<b>Internal 40</b>	<b>External 60</b>

### COURSE OUTCOMES

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

CO1 : outline the basics of computer, purpose of input/output devices, various input technologies and progress of computer languages from machine level to high level.

[K1]

CO2 : recognize the evaluation of arithmetic operations by the processor, the registers involved in arithmetic operations and about the evolution and classification of computers. [K1]

CO3 : classify different kinds of input/output technologies, machine, assembly, high level languages and computers. [K2]

CO4 : interpret problem solving using computers through the concepts of algorithms, computer model, its characteristics and computer generation & classification. [K2]

CO5 : acquire the knowledge of computer basics, input/output devices, calculating, arithmetic operations using computers, programming languages, generation and classification of computers. [K3]

Course Code 20UCAN31	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	L	M	-	-	-	-	-
CO2	L	M	-	-	-	-	-
CO3	L	M	-	-	-	-	-
CO4	L	M	-	-	-	-	-
CO5	L	M	-	-	-	-	-



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VIRUDHUNAGAR - 626 001

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

### 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]

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





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VIRUDHUNAGAR - 626 001

Semester IV	JAVA PROGRAMMING	Hours/Week: 4	
Core Course 8		Credits: 4	
Course Code 20UCAC41		Internal 25	External 75

### COURSE OUTCOMES

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

CO1: gain knowledge on the concept of object oriented programming and fundamentals of Java. [K1]

CO2: understand the behaviour of programs involving the basic programming constructs. Identify the introductory concepts of classes, methods, inheritances, interfaces, packages, multithreading, exceptions, applet & graphics programming. [K2]

CO3: apply OOP concepts in problem solving. [K3]

CO4: analyze and use Java in a variety of applications. [K4]

CO5: choose real world applications and solve it using Java Application and Applet. [K5]

Course Code 20UCAC41	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	H	H	L	-	-	-	-	-	-	-
CO2	H	H	-	M	M	-	-	-	-	-
CO3	M	M	M	H	M	L	L	H	-	-
CO4	M	H	L	M	H	M	L	M	-	-
CO5	M	-	L	L	L	-	-	M	-	-



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VIRUDHUNAGAR - 626 001

Semester IV	JAVA PROGRAMMING LAB	Hours/Week: 4	
Core Course: 9		Credits: 2	
Course Code 20UCAC41P		Internal 40	External 60

### COURSE OUTCOMES

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

CO1: apply the perspectives of Java to solve the problems. [K3]

CO2: develop programs implementing classes, methods, inheritances, interfaces, packages, multithreading, exceptions, applet & graphics programming. [K3]

CO3: build and modify the codes to produce required output. [K3] CO4: present output effectively and prepare the record. [K3]

CO5: test for programs with modifications and justify the results. [K4]

Course Code 20UCAC41P	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	H	H	M	-	-	-	-	-	-	-
CO2	H	H	L	H	M	-	-	-	L	-
CO3	M	M	L	H	M	L	L	H	-	-
CO4	L	L	L	M	M	L	L	M	-	-
CO5	H	M	L	-	-	-	-	M	-	L



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VIRUDHUNAGAR - 626 001

Semester IV	JAVA PROGRAMMING LAB	Hours/Week: 4	
Core Course: 9		Credits: 2	
Course Code 20UCAC41PN		Internal 40	External 60

### COURSE OUTCOMES

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

CO1: apply the perspectives of Java to solve the problems. [K3]

CO2: develop programs implementing classes, methods, inheritances, interfaces, packages, multithreading, exceptions, applet & graphics programming. [K3]

CO3: build and modify the codes to produce required output. [K3]

CO4: present output effectively and prepare the record. [K3]

CO5: test for programs with modifications and justify the results. [K4]

Course Code 20UCAC41PN	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	H	H	M	-	-	-	-	-	-	-
CO2	H	H	L	H	M	-	-	-	L	-
CO3	M	M	L	H	M	L	L	H	-	-
CO4	L	L	L	M	M	L	L	M	-	-
CO5	H	M	L	-	-	-	-	M	-	L



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VIRUDHUNAGAR - 626 001

Semester IV	FINANCIAL MANAGEMENT	Hours/Week: 4	
Allied Course 4		Credits: 4	
Course Code 20UCAAA41		Internal 25	External 75

### COURSE OUTCOMES

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

CO1: describe the basic concepts of financial management and Tally. [K1]

CO2: interpret the financial statements. [K2]

CO3: apply the rules of accounting for preparing financial statements and accounting reports. [K3]

CO4: analyze the financial statements, accounting vouchers and reports. [K4]

CO5: evaluate the financial position of a concern. [K5]

Course Code 20UCAAA41	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	H	L	-	-	M	-	-
CO2	H	L	L	M	M	-	-
CO3	H	L	L	M	L	-	-
CO4	H	L	L	M	H	-	-
CO5	H	L	L	M	L	L	L



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VIRUDHUNAGAR - 626 001

Semester IV	COMPUTER ORGANIZATION	Hours/Week: 2	
SEC 4		Credits: 2	
Course Code 20UCAS41		Internal 40	External 60

### COURSE OUTCOMES

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

CO1: reproduce the concepts of computer registers, instructions, timing & control, processor organization, I/O devices, interfaces, I/O data transfer. [K1]

CO2: identify the inner working of arithmetic & logic unit in evaluating arithmetic operations and different memory hierarchies. [K1]

CO3: generalize basics of computer organization, central processing unit, computer arithmetic, I/O device organization and classification of memory. [K2]

CO4: make use of the information regarding computer instructions, codes, registers, timing, CPU, evaluation of arithmetic operations, I/O organization and memory. [K3]

CO5: explore knowledge about basic computer organization, processing unit, computer arithmetic, I/O and memory organization. [K4]

Course Code 20UCAS41	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	M	-	L	-	-	-	-	-	-	-
CO2	M	M	L	L	-	-	-	-	-	-
CO3	M	M	M	M	M	-	L	M	-	-
CO4	H	M	L	M	M	L	M	M	-	-
CO5	H	H	L	-	-	L	L	H	-	-



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VIRUDHUNAGAR - 626 001

<b>Semester IV</b>	<b>COMPUTER ORGANIZATION</b>	<b>Hours/Week: 2</b>	
<b>SEC 4</b>		<b>Credits: 2</b>	
<b>Course Code</b>		<b>Internal</b>	<b>External</b>
<b>20UCAS41N</b>		<b>40</b>	<b>60</b>

### COURSE OUTCOMES

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

CO1: reproduce the concepts of computer registers, instructions, timing & control, processor organization, I/O devices, interfaces, I/O data transfer, Mode of transfer.

[K1]

CO2: identify the inner working of arithmetic & logic unit in evaluating arithmetic operations and different memory hierarchies. [K1]

CO3: generalize basics of computer organization, central processing unit, computer arithmetic, I/O organization, Interrupts, DMA and classification of memory. [K2]

CO4: make use of the information regarding computer instructions, codes, registers, timing, CPU, evaluation of arithmetic operations, I/O organization, Interrupts, DMA and Memory. [K3]

CO5: explore knowledge about basic computer organization, processing unit, computer arithmetic, I/O & Mode of Transfer and memory organization. [K4]



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VIRUDHUNAGAR - 626 001

Semester IV	FLASH LAB	Hours/Week: 2	
SEC 5		Credits: 2	
Course Code 20UCAS42P		Internal 40	External 60

### COURSE OUTCOMES

On successful completion of the course, the learners should be able to

CO1: demonstrate the various effects of text in flash. [K3]

CO2: apply effect to various objects and give effects. [K3]

CO3: make use of basic tools of action scripts, develop applications in Flash. [K3]

CO4: write programs for designing CD, Filmstrip. [K3]

CO5: select the required tools to create animated graphics with sound effects. [K4]

Course Code 20UCAS42P	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	H	M	M	-	-	-	-	-	-	-
CO2	-	H	M	M	M	-	-	-	L	-
CO3	M	M	L	H	M	L	L	M	-	-
CO4	H	-	L	H	-	-	L	M	-	-
CO5	H	M	L	-	-	-	-	H	-	L



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**VIRUDHUNAGAR - 626 001**

Semester IV	<b>Flash Lab</b>	Hours/Week: 2	
SEC 4		Credits: 2	
Course Code 20UCAS42PN		Internal 40	External 60

### COURSE OUTCOMES

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

CO1: demonstrate the various effects of text in flash. [K3]

CO2: apply effect to various objects and give effects. [K3]

CO3: make use of basic tools of action scripts, develop applications in Flash.  
[K3]

CO4: write programs for designing cartoons. [K3]

CO5: select the required tools to create animated graphics with sound effects. [K4]

Course Code 20UCAS42PN	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	H	M	M	-	-	-	-	-	-	-
CO2	-	H	M	M	M	-	-	-	L	-
CO3	M	M	L	H	M	L	L	M	-	-
CO4	H	-	L	H	-	-	L	M	-	-
CO5	H	M	L	-	-	-	-	H	-	L





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VIRUDHUNAGAR - 626 001

Semester IV	WEB DESIGN WITH HTML	Hours/Week: 2	
Non Major Elective Course -2		Credits: 2	
Course Code 20UCAN41		Internal 40	External 60

### COURSE OUTCOMES

On successful completion of the course, the learners should be able to

CO1 : Basic knowledge and skills utilizing various HTML tags for designing a static web page. [K1]

CO2 : Describe the History and generation of HTML, designing the HTML documents. The concepts about lists, table handling, image tag, frameset and forms. [K1]

CO3 : Elaborate frameset and forms tags, background and formatting characters of the Web page in web based applications. [K2]

CO4 : Define Hyper Links, anchor tag, identify paragraph, differentiate the levels of heading tag, classify the list in HTML tags, discuss about table handling. [K2]

CO5 : Demonstrate web based application programs, server-side & client-side programming. [K3]

Course Code 20UCAN41	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	M	L	-	-	M	-	-
CO2	M	L	L	-	M	L	-
CO3	M	M	M	M	H	L	-
CO4	M	L	-	-	-	-	-
CO5	M	M	M	L	H	L	-



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VIRUDHUNAGAR - 626 001

<b>Semester IV</b>	<b>CONSTITUTION OF INDIA</b>	<b>Hours/Week: 1</b>
<b>Generic Elective Course</b>		<b>Credit : 1</b>
<b>Course Code 20UGEC41</b>		<b>Internal 100</b>

### COURSE OUTCOMES

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

CO1: identify the importance of Constitution in a State. [K1]

CO2: recognize the concepts and features of Indian constitutions. [K1]

CO3: discuss the forms and functions of Government and its political institutions. [K2]

CO4: trace the functions of legislative, executive and judiciary in the Constitution. [K2]

CO5: construct knowledge over the Indian Constitution. [K3]

<b>Course Code 20UGEC41</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>
<b>CO1</b>	<b>H</b>	<b>M</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>M</b>
<b>CO2</b>	<b>H</b>	<b>M</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>M</b>
<b>CO3</b>	<b>H</b>	<b>M</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>M</b>	<b>M</b>
<b>CO4</b>	<b>H</b>	<b>M</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>M</b>
<b>CO5</b>	<b>H</b>	<b>M</b>	<b>-</b>	<b>-</b>	<b>M</b>	<b>M</b>	<b>M</b>



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**VIRUDHUNAGAR - 626 001**

<b>Semester V</b>	<b>VB.NET PROGRAMMING</b>	<b>Hours/Week: 5</b>	
<b>Core Course: 10</b>		<b>Credits: 5</b>	
<b>Course Code 20UCAC51</b>		<b>Internal 25</b>	<b>External 75</b>

### COURSE OUTCOMES

On successful completion of the course, the learner should be able to

- CO1 : define .NET framework with its assemblies and class, list the important features of VB.NET, highlight the problems solved by using looping statements in VB.NET, state the concepts of delegates. [K1]
- CO2 : summarize the different types of datatypes in VB.NET, explain methods, arrays, inheritance, polymorphism, interface, delegates and exception handling. [K2]
- CO3 : illustrate the concept of boxing and unboxing, jagged arrays, interface, namespace, components, delegates, user defined exception handling and database connectivity using ADO.NET. [K3]
- CO4 : compare value datatypes and referenced datatypes, classify the types inheritance and usage of Thread methods. Point out the important properties and method of docking, timer, progress bar, link label, trackbar, panel, tree view controls. [K4]
- CO5 : choose the real-world problems solved by class, inheritance, methods, delegates, exceptions and database connectivity. [K5]

Course Code 20UCAC51	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	M	-	M	-	-	-	-	-	-	-
CO2	H	M	M	-	-	M	-	-	-	-
CO3	M	H	-	M	M	-	-	M	-	-
CO4	H	-	L	M	M	-	-	M	-	-
CO5	M	H	L	-	-	-	L	H	-	-



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**VIRUDHUNAGAR - 626 001**

<b>Semester V</b>	<b>COMPUTER NETWORKS</b>	<b>Hours/Week: 5</b>	
<b>Core Course: 11</b>		<b>Credits: 5</b>	
<b>Course Code 20UCAC52</b>		<b>Internal 25</b>	<b>External 75</b>

### COURSE OUTCOMES

On successful completion of the course, the learner should be able to

- CO1: State the concepts of network hardware, software, media, recognize the design issues of datalink layer & network layer, describe transport layer services and enumerate concepts of DNS & Email. [K1]
- CO2: Summarize features of transmission media, discuss error detection & correction, demonstrate routing algorithms, and explain the elements of transport protocols, components of email. [K2]
- CO3: Illustrate various communication satellites, protocols of datalink layers, interpret congestion control, concepts of error control & flow control [K3]
- CO4: Analyze switching, compare multiple access protocols, distinguish IPV4 & IPV6, point-out features of TCP, working of DNS. [K4]
- CO5: Assess the working of telephone network, judge performance of sliding window protocols, choose required internet control protocols, recommend TCP/UDP usage, and summarize various resource records of DNS and working of email. [K5]

Course Code 20UCAC52	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	M	M	M	-	-	-	-	-	-	-
CO2	M	M	L	M	H	-	-	-	-	-
CO3	H	M	M	M	M	L	L	M	-	-
CO4	H	M	L	H	M	L	L	H	-	-
CO5	M	H	L	-	-	-	-	M	-	-



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**VIRUDHUNAGAR - 626 001**

<b>Semester V</b>	<b>SOFTWARE ENGINEERING</b>	<b>Hours/Week: 5</b>	
<b>Core Course: 12</b>		<b>Credits: 5</b>	
<b>Course Code 20UCAC53</b>		<b>Internal 25</b>	<b>External 75</b>

### COURSE OUTCOMES

On successful completion of the course, the learner should be able to

- CO1 : recall the concepts of software engineering basics, planning, cost estimation, SRS, design, verification, validation and maintenance. [K1]
- CO2 : elaborate about software project base ideas, planning activities, software cost, requirement specification, design activities, verification, validation techniques and maintenance. [K2]
- CO3 : use the software engineering concepts to choose appropriate life cycle model based on size, effort, quality factors, estimate cost, plan, define requirements, design, review, debug, test and maintain software. [K3]
- CO4 : examine project size, quality & productivity factors, planning activities, SRS, design, verification, validation and maintenance activities. [K4]
- CO5 : create project document, estimate needed programmer month, development time, programmers, measure software complexity. [K5]

Course Code 20UCAC53	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	M	M	M	-	-	-	-	-	-	-
CO2	M	M	M	-	-	-	-	-	-	-
CO3	M	H	M	M	M	-	-	M	-	-
CO4	H	H	L	M	M	-	-	M	-	-
CO5	H	H	L	-	-	L	L	H	L	L



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VIRUDHUNAGAR - 626 001

<b>Semester V</b>	<b>VB.NET PROGRAMMING LAB</b>	<b>Hours/Week: 5</b>	
<b>Core Course: 13</b>		<b>Credits: 2</b>	
<b>Course Code</b> <b>20UCAC51P</b>		<b>Internal</b> <b>40</b>	<b>External</b> <b>60</b>

### COURSE OUTCOMES

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

CO1 : apply the concepts of class and objects and write programs. [K3]

CO2 : use looping statements, write VB.NET programs. [K3]

CO3 : illustrate the concept of boxing and unboxing, jagged arrays, interface, namespace, components, delegates and write programs. [K3]

CO4 : use various windows form controls solve real world problems in VB.NET. [K3]

CO5 : develop application software using VB.NET programming language. [K4]

Course Code 20UCAC51P	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	M	-	M	-	M	-	M	-	-	-
CO2	H	M	M	-	-	M	-	-	-	-
CO3	M	-	-	M	-	-	-	M	-	-
CO4	H	M	L	M	M	-	-	-	-	-
CO5	M	H	L	-	-	-	L	H	-	L



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**VIRUDHUNAGAR - 626 001**

<b>Semester V</b>	<b>SYSTEM SOFTWARE</b>	<b>Hours/Week: 4</b>	
<b>DSEC1</b>		<b>Credits: 4</b>	
<b>Course Code 20UITE51</b>		<b>Internal 25</b>	<b>External 75</b>

### COURSE OUTCOMES

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

- CO1 : recall the relationship between system software and machine architecture, assembler features, loader functions, macro processor and compiler functions. [K1]
- CO2 : outline the concepts of one pass, two pass and multi pass assemblers, loaders and linkers, SIC, macro processors and lexical analysis phase for the generation of machine codes.[K2]
- CO3 : construct simplified instructional computer machine dependent and independent assembler, compiler, macro processor to generate executable files.[K3]
- CO4 : examine the architecture of RISC, CISC ,the functions of assemblers, loaders, macro processors design options and compilers for the object program enhancement. [K4]
- CO5 : measures evaluation processes, system software tools and functionality of linkers and compilers for the core functions of operating systems.[K5]

Course Code 20UITE51	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	L	M	M	L	M	M	-
CO2	H	H	L	M	H	L	-	L	M	L
CO3	H	L	M	M	M	M	M	H	-	L
CO4	H	H	M	L	H	H	M	L	L	H
CO5	H	H	M	L	H	H	M	M	-	-



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**VIRUDHUNAGAR - 626 001**

<b>Semester V</b>	<b>COMPUTER GRAPHICS</b>	<b>Hours/Week: 4</b>	
<b>DSEC1</b>		<b>Credits: 4</b>	
<b>Course Code</b> <b>20UCAE52</b>		<b>Internal 25</b>	<b>External</b> <b>75</b>

### COURSE OUTCOMES

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

- CO1 : identify the applications of Computer Graphics, recognize the devices of the graphics system, describe the output primitive attributes, the concepts of geometric transformations, visible-surface, viewing pipeline and clipping operations. [K1]
- CO2 : understand the basics of computer graphics , 2D and 3D Transformations, attributes of output primitive, clipping algorithms, graphical user interfaces and interactive input methods. [K2]
- CO3 : use geometric transformations on graphics objects and their application in composite form, and to know how graphical input and output devices work, solve the problems on viewing transformations. [K3]
- CO4 : analyse how primitive graphical objects are generated in the computer, compare the algorithms for drawing a point, line, circle., classify the visible-surface detection methods. [K4]
- CO5 : create programs for real time applications by implementing algorithms of computer graphics. [K5]

Course Code 20UCAE 52	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	H	M	H	M	-	M	-	-	-	-
CO2	H	H	M	M	M	-	-	-	-	L
CO3	M	M	M	H	M	L	L	M	-	-
CO4	M	-	L	M	-	L	L	M	-	-
CO5	-	M	L	-	-	-	-	H	L	-





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**VIRUDHUNAGAR - 626 001**

Semester V	<b>MICROPROCESSOR USING 8085</b>	<b>Hours/Week: 4</b>	
DSEC1		<b>Credits: 4</b>	
Course Code <b>20UCAE53</b>		<b>Internal 25</b>	<b>External 75</b>

## COURSE OUTCOMES

On successful completion of the course, the learner should be able to

CO1: outline the fundamentals of 8085, its architecture and instruction sets. [K1]

CO2: understand the 8085 addressing modes, instructions and programming techniques, counters, time delays, stack, subroutines, code conversions, BCD arithmetic operations and interrupts. [K2]

CO3: illustrate the implementations of counters, time delays, stack, subroutines, code conversions, BCD arithmetic operations and interrupts, [K3]

CO4: classify the instructions based on its data format and storage, categories the types of memory, analyse memory map and address range of a memory chip, interfacing concepts, counters and time delays. [K4]

CO5: create simple assembly language program for real time applications using 8085 instructions.[K5]

Course Code 20UCAE53	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	H	M	H	M	-	M	-	-	-	-
CO2	H	H	M	M	M	-	-	-	-	L
CO3	M	M	M	H	M	L	L	M	-	-
CO4	M	-	L	M	-	L	L	M	-	-
CO5	-	M	L	-	-	-	-	H	L	-



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VIRUDHUNAGAR - 626 001

Semester V	SYSTEM TESTING LAB	Hours/Week: 4	
DSEC2		Credits: 2	
Course Code 20UITE51P		Internal 40	External 60

### COURSCOURSE OUTCOMES

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

CO1: construct and test sample programs by using different testing techniques and learn test case designing. [K3]

CO2: identify the Fault cases in the program with that its logic validation data analysis before they are used. [K3]

CO3: discover and test different a range of software testing techniques and strategies for the real time projects.[ K3]

CO4: develop the basic path testing cases and procedures for the verification process. [K3]

CO5: analyze the different types of test cases to understand real world IT problem. [K4]

Course Code 20UITE51P	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	H	H	H	M	H	-
CO2	H	H	M	H	H	H	M	H	M	-
CO3	H	H	H	H	H	M	M	M	H	-
CO4	H	H	H	H	L	H	M	M	M	-
CO5	M	L	H	H	M	H	M	M	H	-



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VIRUDHUNAGAR - 626 001

Semester V	COMPUTER GRAPHICS PROGRAMMING LAB	Hours/Week: 4	
DSEC2		Credits: 2	
Course Code 20UCAE52P		Internal 40	External 60

### COURSE OUTCOMES

On successful completion of the course, the learners should be able to

- CO1 : apply the specification of syntax and rules for C Graphics functions.[K3]
- CO2 : write programs using C for drawing pixel, line, circle, text, filling and clipping objects, 2D and 3D transformations. [K3]
- CO3 : execute the programs with required input. [K3]
- CO4 : prepare the record with the neat output. [K3]
- CO5 : analyze and test program with different inputs and justify the result. [K4]

Course Code	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	H	H	H	-	-	-	-	-	-	-
CO2	H	H	M	M	M	-	-	-	-	L
CO3	M	L	L	H	M	L	L	M	-	-
CO4	M	-	L	M	-	L	H	M	-	L
CO5	M	M	L	-	-	-	-	H	M	-



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VIRUDHUNAGAR - 626 001

Semester V	MICROPROCESSOR LAB	Hours/Week: 4	
DSEC2		Credits: 2	
Course Code 20UCAE53P		Internal 40	External 60

### COURSE OUTCOMES

On successful completion of the course, the learners should be able to

- CO1: apply the specification of syntax and rules for simple arithmetic, logical, shift operations and transfer/exchange of data in memory locations. [K3]
- CO2: write programs using arrays, operators, decision making and looping statements. [K3]
- CO3: execute the programs with required input. [K3]
- CO4: prepare the record with the neat output. [K3]
- CO5: analyze and test program with different inputs and justify the result. [K4]

Course Code	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	H	M	H	-	-	-	-	-	-	-
CO2	H	H	M	M	M	-	-	-	-	L
CO3	M	M	M	H	M	L	L	M	-	-
CO4	M	-	L	M	-	L	L	M	-	-
CO5	-	M	L	-	-	-	-	H	L	-



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**VIRUDHUNAGAR - 626 001**

<b>Semester V</b>	<b>PROJECT</b>	<b>Hours/Week: 0</b>
<b>Project</b>		<b>Credit: 1</b>
<b>Course Code</b> <b>20UCAC5PR</b>		<b>Internal</b> <b>100</b>

### COURSE OUTCOMES

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

- CO1 : explore on planning, analysis and design of a project. [K3]
- CO2 : Identify methodologies and professional way of documentation and communication. [K3]
- CO3 : determine the key stages in development of the project. [K3]
- CO4 : execute the project using test data. [K3]
- CO5 : analyse the developed project with the needs of the Industry. [K4]

Course Code <b>20UCAC5PR</b>	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
<b>CO1</b>	<b>H</b>	<b>H</b>	<b>M</b>	<b>M</b>	<b>M</b>	<b>M</b>	<b>-</b>	<b>-</b>	<b>L</b>	<b>M</b>
<b>CO2</b>	<b>H</b>	<b>M</b>	<b>H</b>	<b>M</b>	<b>-</b>	<b>M</b>	<b>-</b>	<b>M</b>	<b>M</b>	<b>M</b>
<b>CO3</b>	<b>M</b>	<b>-</b>	<b>-</b>	<b>M</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>M</b>	<b>M</b>	<b>M</b>
<b>CO4</b>	<b>H</b>	<b>M</b>	<b>L</b>	<b>M</b>	<b>M</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>M</b>
<b>CO5</b>	<b>M</b>	<b>H</b>	<b>L</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>H</b>	<b>L</b>	<b>M</b>	<b>M</b>



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**VIRUDHUNAGAR - 626 001**

<b>Semester V</b>	<b>POINTERS IN C AND C++</b>	<b>Hours/Week: 0</b>	
<b>Extra Credit Course</b>		<b>Credits: 2</b>	
<b>Course Code</b> <b>20UCA051</b>		<b>Internal</b> <b>100</b>	<b>External</b> <b>1</b> <b>-</b>

### COURSE OUTCOMES

On successful completion of the course, the learners should be able to

- CO1 : understand the knowledge of pointers in C and C++.
- CO2 : learn various types of arrays with pointers.
- CO3 : explore the concepts on strings with pointers.
- CO4 : acquire knowledge on structure and pointer.
- CO5 : know about memory allocation operators, void, this, smart pointer and pointers to members.



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VIRUDHUNAGAR - 626 001

Semester V	ENVIRONMENTAL STUDIES	Hours/Week: 2	
PART IV		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



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VIRUDHUNAGAR - 626 001

<b>Semester VI</b>	<b>WEB PROGRAMMING</b>	<b>Hours/Week: 5</b>	
<b>Core Course: 14</b>		<b>Credits: 5</b>	
<b>Course Code</b> <b>20UCAC61</b>		<b>Internal</b> <b>25</b>	<b>External</b> <b>75</b>

### COURSE OUTCOMES

CO1 : gain knowledge on the fundamentals of HTML tags, Javascript, PHP and JSP. [K1]

CO2 : understand concepts of web page creation using HTML, Javascript, PHP and JSP. [K2]

CO3 : make use of HTML, JavaScript, PHP and JSP to design simple web pages.[K3]

CO4 : analyze how the web works and the steps of creating a website using HTML, JavaScript, PHP and JSP. [K4]

CO5 : choose real time applications and create dynamic web pages. [K5]

On successful completion of the course, the learner should be able to

Course Code 20UCAC61	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	M	M	M	-	-	-	-	-	-	-
CO2	M	M	M	M	M	-	-	-	-	-
CO3	H	M	L	M	H	L	L	H	L	-
CO4	H	M	L	H	M	L	L	M	L	-
CO5	H	H	L	-	-	-	-	M	L	L





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**VIRUDHUNAGAR - 626 001**

<b>Semester VI</b>	<b>DATABASE MANAGEMENT SYSTEMS</b>	<b>Hours/Week: 5</b>	
<b>Core Course: 15</b>		<b>Credits: 5</b>	
<b>Course Code</b> <b>20UCAC62</b>		<b>Internal</b> <b>25</b>	<b>External</b> <b>175</b>

### COURSE OUTCOMES

On successful completion of the course, the learner should be able to

- CO1 : gain knowledge on the fundamentals of data models, SQL, data security, integrity, recovery and PL/SQL . [K1]
  
- CO2 : understand concepts of database design, normalization, relational algebra and PL/SQL. [K2]
  
- CO3 : make use of database system, relational model, functional dependency, relational algebra, database security and recovery. [K3]
  
- CO4 : classify the database modelling and analyze how SQL queries, PLSQL exceptions, triggers, function and procedure works. [K4]
  
- CO5 : examine RDBMS terminology, data normalization, operations in relational algebra, calculus and procedural features of SQL and PLSQL. [K5]

Course Code 20UCAC62	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	M	M	M	-	-	-	-	-	-	-
CO2	M	H	M	M	M	-	-	-	-	-
CO3	H	M	L	M	H	L	L	H	L	-
CO4	H	H	L	H	L	L	L	M	M	L
CO5	H	H	L	-	-	-	-	M	L	-



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**VIRUDHUNAGAR - 626 001**

<b>Semester VI</b>	<b>DATA MINING</b>	<b>Hours/Week: 5</b>	
<b>Core Course: 16</b>		<b>Credits: 5</b>	
<b>Course Code</b> <b>20UCAC63</b>		<b>Internal</b> <b>25</b>	<b>External</b> <b>75</b>

### COURSE OUTCOMES

On successful completion of the course, the learner should be able

- CO1 : gain the knowledge about the basics of data mining, data objects, pre-processing, data warehouse, mining patterns, classification and cluster analysis concepts. [K1]
- CO2 : classify data, patterns, data visualization, OLAP, mining methods, classification methods and cluster analysis methods. [K2]
- CO3 : apply the data mining techniques in real time problems. [K3]
- CO4 : analyze the different technology used in data mining. [K4]
- CO5 : perform evaluation of pattern, classification and clustering in real time problems. [K5]

Course Code 20UCAC63	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
	CO1	H	H	M	-	-	-	-	-	-
CO2	H	M	M	M	M	-	-	-	-	-
CO3	M	M	M	H	H	L	L	M	-	-
CO4	M	M	L	M	H	L	L	M	-	-
CO5	-	M	L	-	-	-	-	H	-	-



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**VIRUDHUNAGAR - 626 001**

<b>Semester VI</b>	<b>WEB PROGRAMMINGLAB</b>	<b>Hours/Week: 5</b>	
<b>Core Course: 17</b>		<b>Credits: 2</b>	
<b>Course Code</b> <b>20UCAC61P</b>		<b>Internal</b> <b>40</b>	<b>External</b> <b>60</b>

### COURSE OUTCOMES

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

CO1 : use the knowledge of HTML, CSS code and Javascript to create personal or business websites with current professional standards. [K3]

CO2 : write programs to implement creative skills in design and create websites. [K3]

CO3 : key in the programs, test the programs with required input and get expected outputs with neat formatting and prepare the record work. [K3]

CO4 : explain the given program and deduce the results/answers for any queries raised. [K3]

CO5 : reconstruct the program to incorporate required modification and justify the desired result. [K4]

Course Code <b>20UCAC61P</b>	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1.a	1.b	2	3.a	3.b	4.a	4.b	5	6	7
<b>CO1</b>	<b>H</b>	<b>H</b>	<b>M</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>CO2</b>	<b>H</b>	<b>H</b>	<b>M</b>	<b>M</b>	<b>M</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>L</b>
<b>CO3</b>	<b>M</b>	<b>M</b>	<b>L</b>	<b>H</b>	<b>M</b>	<b>L</b>	<b>L</b>	<b>H</b>	<b>-</b>	<b>-</b>
<b>CO4</b>	<b>M</b>	<b>-</b>	<b>L</b>	<b>M</b>	<b>-</b>	<b>L</b>	<b>L</b>	<b>M</b>	<b>L</b>	<b>-</b>
<b>CO5</b>	<b>-</b>	<b>M</b>	<b>L</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>M</b>	<b>L</b>	<b>-</b>



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**VIRUDHUNAGAR - 626 001**

<b>Semester VI</b>	<b>MOBILE APPLICATION DEVELOPMENT</b>	<b>Hours/Week: 4</b>	
<b>DSEC 3</b>		<b>Credits: 4</b>	
<b>Course Code</b>		<b>Internal</b>	<b>External</b>
<b>20UCAE61</b>		<b>25</b>	<b>75</b>

### COURSE OUTCOMES

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

- CO1 : recite the concepts of Android programming basics, Activities, Fragments, Intents, UI, Views, inserting pictures, menus and data persistence. [K1]
- CO2 : interpret about Android basics, Activities, Fragments, Intents, UI, Views, apps with pictures, menus and data storage in memory card, Databases. [K2]
- CO3 : identify the needed views to design the UI and use Activities, Fragments, intents, picture insertion, menu, Data storage in Android Apps. [K3]
- CO4 : figure out the elements needed for the UI designing such as views, menu, images and combine the concepts such as activities, fragment, intent and data persistence. [K4]
- CO5 : design simple Android Apps using Android basics, Activities, Fragments, Intents, UI, Views, pictures, menus and data persistence. [K5]

Course Code	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
<b>20UCAE61</b>										
<b>CO1</b>	M	M	M	-	-	-	-	-	-	-
<b>CO2</b>	M	M	M	M	M	-	-	-	-	-
<b>CO3</b>	M	M	M	M	M	L	L	M	L	-
<b>CO4</b>	H	M	L	H	M	L	L	M	L	-
<b>CO5</b>	H	H	L	-	-	-	-	H	L	L



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VIRUDHUNAGAR - 626 001

Semester VI	<b>PYTHON PROGRAMMING</b>	Hours/Week: 4	
DSEC 3		Credits: 4	
Course Code 20UCAE62		Internal 125	External 75

### COURSE OUTCOMES

On successful completion of the course, the learner should be able to

- CO1 : gain knowledge on the fundamentals of Python Programming, basic branching, mutable & immutable objects, errors and data storage. [K1]
- CO2 : understand the functions, control structures, strings, objects, exception and manage databases in Python. [K2]
- CO3 : apply the essential concepts such as control structures, functions, strings, files and objects to deal with complex applications. [K3]
- CO4 : demonstrate the use of operators, functions, strings, objects, files and databases. [K4]
- CO5 : design and implement a program to solve a real world problems using operators, functions, statements, strings, objects, files and exceptions. [K5]

Course Code 20UCAE62	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	M	M	M	-	-	-	-	-	-	-
CO2	M	M	M	M	H	-	-	-	-	-
CO3	M	M	M	M	M	L	L	H	L	-
CO4	H	M	L	H	M	L	L	M	L	-
CO5	H	H	L	-	-	-	-	H	L	L



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VIRUDHUNAGAR - 626 001

Semester VI	EMBEDDED SYSTEM	Hours/Week: 4	
DSEC 3		Credits: 4	
Course Code 20UITE63		Internal 25	External

### COURSE OUTCOMES

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

- CO1: list the Hardware, Software, design technologies, Microcontrollers and program modeling concepts used in designing Embedded Systems to acquire the knowledge of the components of Information Technology. [K1]
- CO2: outline the Embedded System architecture, design process, Microcontrollers, designing C, C++ and Java programs that gain ability to familiarize the latest trends in technological development. [K2]
- CO3: identify the features of the microcontrollers and provide the exact solutions for any embedded applications that helps in applying standard Software Engineering practices. [K3]
- CO4: analyze suitable microcontroller along with appropriate interfacing circuits and implement with software programs that enhances the practice in the core information technologies of human computer interaction. [K4]
- CO5: determine the key concepts of embedded systems such as I/O, interrupts and interaction with peripheral devices through software to carry out societal IT projects. [K5]

Course Code 20UITE63	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	M	L	H	M	L	L
CO2	H	H	L	H	M	M	M	H	L	L
CO3	H	H	H	M	H	H	H	M	L	L
CO4	H	H	L	M	H	M	H	M	L	L
CO5	H	H	M	H	H	H	M	M	L	L



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**VIRUDHUNAGAR - 626 001**

<b>Semester VI</b>	<b>MOBILE APPLICATION DEVELOPMENT LAB</b>	<b>Hours/Week: 4</b>	
<b>DSEC 4</b>		<b>Credits: 2</b>	
<b>Course Code 20UCAE61P</b>		<b>Internal 40</b>	<b>External 60</b>

### COURSE OUTCOMES

On successful completion of the course, the learners should be able to

- CO1 : identify the packages, classes and methods needed for the problem. [K3]
- CO2 : make use of views, menu, images to design UI and write programs using activities, fragment, intent and data persistence. [K3]
- CO3 : key-in the programs and test the programs with required input and get expected outputs with neat formatting and prepare the record work. [K3]
- CO4 : explain the UI design, activities in App and deduce the answers for any queries raised. [K3]
- CO5 : reconstruct the program to adapt the necessary modifications and justify the desired result. [K4]

Course Code 20UCAE61P	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
<b>CO1</b>	H	M	M	-	-	-	-	-	-	-
<b>CO2</b>	H	M	M	M	M	-	-	-	-	L
<b>CO3</b>	M	M	L	H	M	L	L	M	-	L
<b>CO4</b>	M	-	L	M	-	L	L	M	L	-
<b>CO5</b>	-	M	L	-	-	-	-	H	L	-



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VIRUDHUNAGAR - 626 001

Semester VI	PYTHON PROGRAMMINGLAB	Hours/Week: 4	
DSEC 4		Credits: 2	
Course Code 20UCAE62P		Internal 40	External 60

### COURSE OUTCOMES

On successful completion of the course, the learners should be able to

- CO1 : identify the basic concepts of functions, strings, mutable and immutable objects. [K3]
- CO2 : write programs implementing string, files and make connections with databases in applications. [K3]
- CO3 : key-in the programs and test the programs with required input and get expected outputs with neat formatting and prepare the record work. [K3]
- CO4 : explain the programs implemented using Python and deduce the answers for any queries raised. [K3]
- CO5 : reconstruct the program to adapt the necessary modifications and justify the desired result. [K4]

Course Code 20UCAE62P	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PS O 1.a	PS O 1.b	PS O 2	PSO 3.a	PSO 3.b	PS O 4.a	PS O 4.b	PSO 5	PS O 6	PSO 7
CO1	H	M	M	-	-	-	-	-	-	-
CO2	H	H	M	M	M	-	-	-	-	L
CO3	M	M	L	H	M	L	L	M	-	-
CO4	M	-	L	M	-	L	L	M	L	-
CO5	-	M	L	-	-	-	-	H	L	-





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**VIRUDHUNAGAR - 626 001**

<b>Semester VI</b>	<b>R PROGRAMMING LAB</b>	<b>Hours/Week: 4</b>	
<b>DSEC 4</b>		<b>Credits: 2</b>	
<b>Course Code</b> <b>20UITE63P</b>		<b>Internal 40</b>	<b>External 60</b>

## COURSE OUTCOMES

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

- CO1 : utilize 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. [K3]
- CO2 : apply the control structures like looping and conditional statements in R to store, process and sort the data in easier manner. [K3]
- CO3 : interpret the concepts of arrays and vectors in R to implement sorting and searching problems to enhance their knowledge. [K3]
- CO4 : discover the capabilities of R data expression for data verification and Recursion procedure for building performance efficient R programs. [K3]
- CO5 : analyze the different packages in R language to manipulate the large set of data that will improve their lifelong learning. [K4]

Course Code 20UITE63P	PO1		PO2	PO3		PO4		PO5
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5
CO1	H	M	M	-	-	-	-	-
CO2	H	M	M	M	M	-	-	-
CO3	M	M	L	H	M	L	L	M
CO4	M	-	L	M	-	L	L	M
CO5	-	M	L	-	-	-	-	H



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VIRUDHUNAGAR - 626 001

Semester VI	DATABASE LAB	Hours/Week: 2	
SEC 6		Credits: 2	
Course Code 20UCAS61P		Internal 40	External 60

### COURSE OUTCOMES

On successful completion of the course, the learners should be able to

CO1 : write SQL statements using commands. [K3]

CO2 : make use of PL/SQL exception, cursor, trigger, procedure and function . [K3]

CO3 : build and execute the codes to produce required output. [K3]

CO4 : present output effectively and prepare the record. [K3]

CO5 : test the program and justify the results. [K4]

Course Code 20UCAS61P	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9
CO1	H	H	M	-	-	-	-	-	-
CO2	M	M	H	M	M	-	-	-	-
CO3	H	M	L	H	M	L	L	M	-
CO4	M	-	L	M	-	L	-	L	L
CO5	-	M	L	-	-	-	-	H	M
CO6	H	M	M	-	-	-	-	-	-