

YEAR	I	SEMESTER	I	L	T	P	C
COURSE CODE / COURSE TITLE	191MA101 / ENGINEERING MATHEMATICS - I			2	2	0	3

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Analyze the characteristics equation of a linear system with Eigen values and vectors for practical application.
CO2	Determine the bending of family of curves using differential calculus which deals in various disciplines.
CO3	Apply partial derivatives in various engineering problems.
CO4	Identify and solve the real time problems using higher order differential equations.

CO-PO & PSO Mapping															
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO 1	3	3	2	2	2	-	-	-	-	-	-	1	-	-	1
CO 2	3	3	2	2	1	-	-	-	-	-	-	1	-	-	1
CO 3	3	3	2	2	1	-	-	-	-	-	-	1	-	-	1
CO 4	3	3	2	2	1	-	-	-	-	-	-	1	-	-	1
CO	3	3	2	2	1	-	-	-	-	-	-	1	-	-	1
CO	3	3	2	2	1	-	-	-	-	-	-	1	-	-	1

  
COURSE IN-CHARGE(S)


  
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Computer Science and Engineering  
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Dr. Rangarajan Dr. Sakunthala Engg. College  
Avadi, Chennai - 600 062.

YEAR	I	SEMESTER	I	L	T	P	C
COURSE CODE / COURSE TITLE	191PH101 / ENGINEERING PHYSICS			3	0	0	3

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Demonstrate the proficiency on the properties of matter and its applications
CO2	Describe the working principles of Laser and its developments in industrial and medical applications
CO3	Explain the propagation of waves in optical fibers and their applications
CO4	Apply the theory of wave nature of particles in various microscopic applications
CO5	Analyze the structure of materials and its crystal growth techniques

CO –PO&PSOMapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P O 10	P O 11	PO1 2	PSO 1	PSO 2	PSO 3
CO1	3	3	2	2	-	2	2	2	2	-	-	2	1	-	-
CO2	3	3	2	2	-	2	2	2	2	-	-	2	1	-	-
CO3	3	3	2	2	-	2	2	2	2	-	-	2	1	-	-
CO4	3	3	2	2	-	2	2	2	2	-	-	2	1	-	-
CO5	3	3	2	2	-	2	2	2	2	-	-	2	1	-	-
CO	3	3	2	2	-	2	2	2	2	-	-	2	1	-	-

  
COURSE IN-CHARGE(S)

  
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YEAR	I	SEMESTER	I	L	T	P	C
COURSE CODE / COURSE TITLE	191CH101 / ENGINEERING CHEMISTRY			3	0	0	3

### COURSE OUTCOMES

On completion of the course, students will be able to

CO1	Analyse microscopic chemistry in terms of atomic, molecular and Intermolecular forces for real time applications of semiconductors.
CO2	Investigate the various water treatment and softening methods.
CO3	Appraise the types and mechanism of electrochemical reaction in batteries and fuel cells.
CO4	Explain the basic principle, types and mechanism of polymerization process and techniques.
CO5	Assess the properties, characterization and applications of advanced materials for energy storage.

### CO – PO&PSOMapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO 1	3	3	2	2	-	2	2	-	-	-	-	2	1	1	1
CO 2	3	3	2	2	-	2	2	-	-	-	-	2	1	1	1
CO 3	3	3	2	2	-	2	2	-	-	-	-	2	1	1	1
CO 4	3	3	2	2	-	2	2	-	-	-	-	2	1	1	1
CO 5	3	3	2	2	-	2	2	-	-	-	-	2	1	1	1
CO	3	3	2	2	-	2	2	-	-	-	-	2	1	1	1

  
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YEAR	I	SEMESTER	I	L	T	P	C
COURSE CODE / COURSE TITLE	191HS101 / ENGLISH FOR ENGINEERING STUDENTS			3	0	0	3

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Infer meanings of unfamiliar words from context
CO2	Enable to achieve linguistic competence and be able to use grammar as a tool or resource in the comprehension and creation of oral and written discourse efficiently according to the situation.
CO3	Write cohesively, coherently and flawlessly with a wide range of vocabulary and organizing their ideas logically on a topic.
CO4	Activate and reinforce the habit of reading and writing effectively in their discipline.
CO5	Collaborate with multicultural environment.

CO-PO & PSO Mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS O1	PSO 2	PS O3
CO1	3	2	1	-	-	-	-	-	2	2	-	2	1	-	-
CO2	3	2	1	-	-	-	-	-	2	2	-	2	1	-	-
CO3	3	2	1	-	-	-	-	-	2	2	-	2	1	-	-
CO4	3	2	1	-	-	-	-	-	2	2	-	2	1	-	-
CO5	3	2	1	-	-	-	-	-	2	2	-	2	1	-	-
CO	3	2	1	-	-	-	-	-	2	2	-	2	1	-	-

  
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YEAR	I	SEMESTER	I	L	T	P	C
COURSE CODE / COURSE TITLE	191ME111 / BASIC CIVIL AND MECHANICAL ENGINEERING			3	0	0	3

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Learn the usage of construction material and proper selection of construction materials
CO2	Identify about water resources, sewage treatment and transportation systems
CO3	Design the components use in power plants
CO4	Describe the internal combustion engines
CO5	Analyze about the renewable energy sources and refrigeration cycles

CO-PO & PSO Mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	1	-	2	2	1	-	-	-	2	2	1	1
CO2	3	3	1	1	-	2	2	1	-	-	-	2	2	1	1
CO3	3	3	1	1	-	2	2	1	-	-	-	2	2	1	1
CO4	3	3	1	1	-	2	2	1	-	-	-	2	2	1	1
CO5	3	3	1	1	-	2	2	1	-	-	-	2	2	1	1
CO	3	3	1	1	-	2	2	1	-	-	-	2	2	1	1

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YEAR	I	SEMESTER	I	L	T	P	C
COURSE CODE / COURSE TITLE	191EE111 / BASIC ELECTRICAL AND ELCTRONICS ENGINEERING			3	0	0	3

### COURSE OUTCOMES

On completion of the course, students will be able to

CO1	Summarizes about different structures of Power system and safety measures.
CO2	Explain about the basics of Electricity
CO3	Discuss on various electric circuits and use of measuring instruments
CO4	Clarify the working of basic electronic devices such as diode, transistor and operational amplifiers
CO5	Infer about Digital Electronics and Communication System

### CO-PO & PSO Mapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO1 2	PS O1	PS O2	PSO3
CO1	3	2	2	-	-	-	-	-	-	-	-	-	2	1	1
CO2	3	2	2	-	-	-	-	-	-	-	-	-	2	1	1
CO3	2	1	1	-	-	-	-	-	-	-	-	-	2	1	1
CO4	2	1	1	1	1	-	-	-	-	-	-	-	2	1	1
CO5	2	1	1	1	-	-	-	-	-	-	-	-	2	1	1
CO	3	2	2	1	1	-	-	-	-	-	-	-	2	1	1

  
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YEAR	I	SEMESTER	I	L	T	P	C
COURSE CODE / COURSE TITLE	191PH10A / PHYSICS LABORATORY			0	0	2	1

### COURSE OUTCOMES

On completion of the course, students will be able to

CO1	Apply the principles of properties of matter in determining the various elastic properties
CO2	Attains the practical knowledge, to apply principles of optics for various engineering applications
CO3	Demonstrate the technical knowledge on Quantum Mechanical concepts

### CO - PO&PSOMapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO 1	3	3	2	2	-	2	2	2	2	-	-	2	1	-	-
CO 2	3	3	2	2	-	2	2	2	2	-	-	2	1	-	-
CO 3	3	3	2	2	-	2	2	2	2	-	-	2	1	-	-
CO	3	3	2	2	-	2	2	2	2	-	-	2	1	-	-

  
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YEAR	I	SEMESTER	I	L	T	P	C
COURSE CODE / COURSE TITLE	191CH10A / CHEMISTRY LABORATORY			0	0	2	1

### COURSE OUTCOMES

On completion of the course, students will be able to

CO1	Acquire knowledge on quantitative chemical analysis by instrumentation and volumetric method.
CO2	Analyse the water sample for hardness, chloride, sodium /potassium content, dissolved oxygen etc.
CO3	Solve analytical problems in spectrometer and flame photometer for the identification and quantification.

### CO-PO&PSOMapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO1 2	PSO 1	PSO 2	PSO 3
CO 1	3	3	2	2	-	2	2	2	2	-	-	2	2	1	1
CO 2	3	3	2	2	-	2	2	2	2	-	-	2	2	1	1
CO 3	3	3	2	2	-	2	2	2	2	-	-	2	2	1	1
CO	3	3	2	2	-	2	2	2	2	-	-	2	2	1	1

  
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YEAR	I	SEMESTER	I	L	T	P	C
COURSE CODE / COURSE TITLE	191ME11A / ENGINEERING PRACTICES LABORATORY			0	0	4	2

### COURSE OUTCOMES

On completion of the course, students will be able to

CO1	Use mechanical and civil engineering equipments to join the structures and perform basic machining operations and fabricate models in sheet meta
CO2	Use electrical and electronics engineering equipment to test the respective electrical .

### CO -PO&PSOMapping

CO	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3	3	2	1	1	1	-	-	-	1	1	3	1	1	1
CO 2	3	3	2	1	1	1	-	-	-	1	1	3	1	1	1
CO	3	3	2	1	1	1	-	-	-	1	1	3	1	1	1

  
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YEAR	I	SEMESTER	II	L	T	P	C
COURSE CODE / COURSE TITLE	191MA201 / ENGINEERING MATHEMATICS II			2	2	0	3

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Evaluate multiple integrals using change of variables.
CO2	Apply various integral theorems for solving engineering problems involving cubes and rectangular parallelepipeds.
CO3	Construct analytic functions of complex variables and transform functions using conformal mappings.
CO4	Estimate the real and complex integrals over suitable closed paths and contours.
CO5	Compute linear differential equations using Laplace transform techniques

CO-PO & PSO Mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS O1	PSO 2	PS O3
CO1	3	3	2	2	2	-	-	-	-	-	-	1	-	-	-
CO2	3	3	2	2	2	-	-	-	-	-	-	1	-	-	-
CO3	3	3	2	2	2	-	-	-	-	-	-	1	-	-	-
CO4	3	3	2	2	2	-	-	-	-	-	-	1	-	-	-
CO5	3	3	2	2	2	-	-	-	-	-	-	1	-	-	-
CO	3	3	2	2	2	-	-	-	-	-	-	1	-	-	-

  
COURSE IN-CHARGE (S)

  
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YEAR	I	SEMESTER	II	L	T	P	C
COURSE CODE / COURSE TITLE	191EC211 / ELECTRON DEVICES AND CIRCUITS			3	0	0	3

CO1	Analyze PN junctions in semiconductor devices under various conditions
CO2	Understand the Characteristics of current flow in BJT with CB,CE and CC configurations
CO3	Realize the characteristics of MOS and FET amplifier
CO4	Discuss the characteristics of power and display devices.
CO5	Employ the acquired knowledge in design and analysis of feedback amplifiers and oscillators.

CO-PO & PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	1	-	-	-	-	1	1	-	2	3	1	1
CO2	3	3	2	2	-	-	-	-	1	1	-	1	3	2	1
CO3	3	2	2	2	-	-	-	-	1	1	-	2	2	2	1
CO4	3	2	1	1	-	-	-	-	1	-	1	1	2	2	1
CO5	3	3	3	1	-	-	-	-	1	1	1	2	3	1	1
CO	3	3	2	2	-	-	-	-	1	1	1	2	3	2	1

COURSE IN-CHARGE (S)

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YEAR	I	SEMESTER	II	L	T	P	C
COURSE CODE / COURSE TITLE	191EC212 / DIGITAL SYSTEM DESIGN			3	0	0	3

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Apply the theorems and postulates of Boolean algebra, the techniques of Karnaugh Maps and Quine-McCluskey tabulation techniques for simplification of logic functions.
CO2	Design combinational logic circuits for various applications and implement them using logic gates or other devices like multiplexers, decoders and simulate them using Hardware Description Language .
CO3	Design synchronous sequential logic circuits like counters and shift registers and implement them using different flip flops.
CO4	Analyze the given Asynchronous sequential logic circuit to determine its function.
CO5	Review the various memory and programmable logic devices.

CO-PO & PSO Mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	-	-	-	-	-	-	-	-	-	1	-	-
CO2	3	2	2	-	-	-	-	-	-	-	-	-	1	-	-
CO3	3	2	2	-	-	-	-	-	-	-	-	-	1	-	-
CO4	3	2	2	-	-	-	-	-	-	-	-	-	1	-	-
CO5	3	2	2	-	-	-	-	-	-	-	-	-	1	-	-
CO	3	2	2	-	-	-	-	-	-	-	-	-	1	-	-

  
COURSE IN-CHARGE (S)

  
HOD

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YEAR	I	SEMESTER	II	L	T	P	C
COURSE CODE / COURSE TITLE	191ME211 / ENGINEERING GRAPHICS			2	2	0	3

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Draw engineering curves and apply the concepts of free hand sketching
CO2	Draw orthographic views of points, lines and surfaces
CO3	Draw visualizations of simple solid objects as per orthographic projections
CO4	Draw sections and developments made in drawing
CO5	Draw pictorial drawings of simple objects

#### CO – PO & PSO Mapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO 1	3	3	3	-	2	1	-	-	-	1	1	1	1	1	1
CO 2	3	3	3	-	2	1	-	-	-	1	1	1	1	1	1
CO 3	3	3	3	-	2	1	-	-	-	1	1	1	1	1	1
CO 4	3	3	3	-	2	1	-	-	-	1	1	1	1	1	1
CO 5	3	3	3	-	2	1	-	-	-	1	1	1	1	1	1
CO	3	3	3	-	2	1	-	-	-	1	1	1	1	1	1

COURSE IN-CHARGE (S)

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YEAR	I	SEMESTER	II	L	T	P	C
COURSE CODE / COURSE TITLE	191CS221 / PROBLEM SOLVING AND PYTHON PROGRAMMING			3	0	0	3

### COURSE OUTCOMES

On completion of the course, students will be able to

CO1	Describe the Algorithmic solutions for simple computational problems.
CO2	Identify the various data expressions , statements in python programming.
CO3	Use control flow and function for solving problems in python.
CO4	Distinguish list tuples and dictionaries in python programming.
CO5	Develop simple programs using files, modules,packages in python..

### CO-PO&PSOMapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO 1	3	3	2	2	-	2	3	3	-	-	-	2	3	3	1
CO 2	3	3	2	2	-	2	3	-	-	-	-	2	3	2	1
CO 3	3	3	2	2	-	2	3	-	-	-	-	2	3	2	1
CO 4	3	3	2	2	-	2	3	-	-	-	-	2	3	2	1
CO 5	3	3	2	2	-	2	3	3	-	-	-	2	3	2	1
CO	3	3	2	2	-	2	3	3	-	-	-	2	3	2	1



COURSE IN-CHARGE (S)



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YEAR	I	SEMESTER	II	L	T	P	C
COURSE CODE / COURSE TITLE	191HS201 / ENVIRONMENTAL SCIENCE AND ENGINEERING			3	0	0	3

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Interpret the concept of ecosystem, biodiversity and its conservation
CO2	Demonstrate the environmental impacts of energy development.
CO3	Categorize the various environmental pollutions and select suitable preventive measures.
CO4	Perceive the environmental effects of human population and the implementation of welfare programs
CO5	Recall the environmental ethics and legal provisions.

CO-PO & PSO Mapping															
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO 1	3	3	2	2	-	2	3	3	-	-	-	2	1	-	-
CO 2	3	3	2	2	-	2	3	-	-	-	-	2	1	-	-
CO 3	3	3	2	2	-	2	3	-	-	-	-	2	1	-	-
CO 4	3	3	2	2	-	2	3	-	-	-	-	2	1	-	-
CO 5	3	3	2	2	-	2	3	3	-	-	-	2	1	-	-
CO	3	3	2	2	-	2	3	3	-	-	-	2	1	-	-

  
COURSE IN-CHARGE (S)

  
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YEAR	I	SEMESTER	II	L	T	P	C
COURSE CODE / COURSE TITLE	191EC21A / CIRCUITS AND DEVICE LABORATORY			0	0	2	1

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Construct and Analyze the characteristics of PN junction diode , Zener diode and Silicon Controlled Rectifier, FET.
CO2	Design and Implement the various Amplifiers like Common Emitter, Common Base and observe their frequency responses.
CO3	Verify different network theorems

CO-PO & PSO Mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	-	-	-	-	-	-	-	-	-	2	-	-
CO2	3	2	2	-	-	-	-	-	-	-	-	-	2	-	-
CO3	3	2	2	-	-	-	-	-	-	-	-	-	2	-	-
CO	3	2	2	-	-	-	-	-	-	-	-	-	2	-	-



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YEAR	I	SEMESTER	II	L	T	P	C
COURSE CODE / COURSE TITLE	191EC21B / DIGITAL SYSTEM DESIGN LABORATORY			0	0	2	1

### COURSE OUTCOMES

On completion of the course, students will be able to

CO1	Build combinational logic circuits for a given application using logic gates, multiplexers, decoders and encoders.
CO2	Build sequential logic circuits for a given application using the given type of flip flops.
CO3	Simulate and test simple combinational logic circuits using Hardware Description Language (HDL).

### CO-PO & PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	-	-	-	-	-	-	-	-	-	2	-	-
CO2	3	2	2	-	-	-	-	-	-	-	-	-	2	-	-
CO3	3	2	2	-	2	-	-	-	-	-	-	-	2	-	-
CO	3	2	2	-	2	-	-	-	-	-	-	-	2	-	-

  
COURSE IN-CHARGE (S)

  
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Avadi, Chennai - 600 062.



YEAR	I	SEMESTER	II	L	T	P	C
COURSE CODE / COURSE TITLE	191CS22A / PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY			0	0	2	1

### COURSE OUTCOMES

On completion of the course, students will be able to

CO1	Solve problems using conditionals and loops in Python.
CO2	Develop Python programs by defining functions.
CO3	Use lists, Tuples and dictionaries for solving complex program in python.
CO4	Create Python programs using files.

### CO – PO&PSOMapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO 1	3	2	1	1	-	-	-	-	-	-	-	1	3	3	1
CO 2	3	2	1	1	-	-	-	-	-	-	-	1	3	2	1
CO 3	3	2	1	1	-	-	-	-	-	-	-	1	3	2	1
CO 4	3	2	1	1	-	-	-	-	-	-	-	1	3	2	1
CO	3	2	1	1	-	-	-	-	-	-	-	1	3	2	1

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YEAR	II	SEMESTER	III	L	T	P	C
COURSE CODE / COURSE TITLE	191MA303 / PROBABILITY AND STATISTICS			2	2	0	3

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Demonstrate and apply the basic probability axioms and concepts in their core areas.
CO2	Analyze the concepts of probability distributions in an appropriate place of science and Engineering.
CO3	Calculate the relationship of two dimensional random variables using correlation techniques and to study the properties of two dimensional random variables.
CO4	Apply the concept of testing of hypothesis for small and large samples in real life problems.
CO5	Identify the classification of design of experiment in their respective fields.

CO'S	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	2	2	1	-	-	-	-	-	-	1	1	0	0
CO2	3	3	2	2	1	-	-	-	-	-	-	1	1	0	0
CO3	3	3	2	2	1	-	-	-	-	-	-	1	1	0	0
CO4	3	3	2	2	1	-	-	-	-	-	-	1	1	0	0
CO5	3	3	2	2	1	-	-	-	-	-	-	1	1	0	0
CO	3	3	2	2	1	-	-	-	-	-	-	1	1	0	0

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Dr. Rangarajan Dr. Lakshmi Engg. Co.,  
Avadi, Chennai-600 062.

YEAR	II	SEMESTER	III	L	T	P	C
COURSE CODE / COURSE TITLE	19ICS321 / DATA STRUCTURE			3	0	0	3

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Describe the basics of C programming language
CO2	Practice the concepts of functions, pointers, structures and unions for the given application
CO3	Interpret and implement linear data structure operations in C
CO4	Analyze and evaluate non linear data structure for the given application
CO5	Apply the hashing concepts and choose the appropriate sorting algorithm for an application

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	2	-	-	-	-	-	2	3	3	1
CO2	3	3	3	3	3	2	-	-	-	-	-	2	3	3	1
CO3	3	3	3	3	3	3	-	-	-	-	3	3	3	3	2
CO4	3	3	3	3	3	3	-	-	-	-	3	3	3	3	2
CO5	3	3	3	3	3	3	-	-	-	-	3	3	3	3	2
	3	3	3	3	3	3	-	-	-	-	3	3	3	3	2

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YEAR	II	SEMESTER	III	L	T	P	C
COURSE CODE / COURSE TITLE	191CS322 / COMPUTER ARCHITECTURE			3	0	0	3

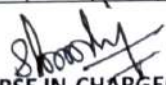
### COURSE OUTCOMES

On completion of the course, students will be able to

CO1	Define the basics concepts of fundamental component, architecture, register organization and performance metrics of a computer.
CO2	Illustrate the efficient algorithm for binary arithmetic operations.
CO3	Construct an efficient data path for an instruction format for a given architecture.
CO4	Categorize various parallel processors.
CO5	Analyze the memory, I/O devices and cache structures for processor.

### CO-PO & PSO Mapping Computer Architecture

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO 1	3	3	2	2	1	1	1	1	1	1	-	-	3	3	2
CO 2	3	3	2	2	1	1	1	1	1	1	-	-	3	3	2
CO 3	3	3	2	2	1	1	1	-	1	-	1	1	3	3	2
CO 4	3	3	2	2	1	1	-	1	1	-	1	1	3	3	2
CO 5	3	3	2	2	1	1	1	1	1	1	1	1	3	3	2
CO	3	3	2	2	1	1	1	1	1	1	1	1	3	3	2

  
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YEAR	II	SEMESTER	III	L	T	P	C
COURSE CODE /COURSE TITLE	191CS323/OBJECTORIENTEDPROGRAMMING			3	0	0	3

### COURSE OUTCOMES

On completion of the course ,students will be able to

CO1	Acquire knowledge in OOPS concept and define the structure of Java programs.
CO2	Identify the concept of inheritance, interfaces and illustrate the Java Programs.
CO3	Develop Java applications using Exceptions and I/O streams
CO4	Analyze and evaluate the concept of threads and generic classes to develop Java applications
CO5	Create interactive Java programs using AWT and Swings

### CO-PO & PSO Mapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO 1	3	2	2	1	-	-	-	1	-	-	-	1	2	2	3
CO 2	3	2	2	1	-	-	-	1	-	-	-	1	2	2	2
CO 3	3	2	2	1	-	-	-	1	-	-	-	1	2	2	3
CO 4	3	2	2	1	-	-	1	1	-	-	-	1	3	2	3
CO 5	3	3	2	1	1	-	1	1	-	-	-	1	3	2	3
CO	3	2	2	1	1	-	1	1	-	-	-	1	2	2	3



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YEAR	II	SEMESTER	III	L	T	P	C
COURSE CODE / COURSE TITLE	191CS324 / SOFTWARE ENGINEERING			3	0	0	3

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Remember the key activities in managing a software project
CO2	Identify different process models and the approach adopted in gathering requirements
CO3	Apply systematic procedure for software design and deployment.
CO4	Analyze , Compare and contrast the various testing and maintenance.
CO5	Evaluate the Management project schedule, estimate project cost and effort required

COs	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3	2	1	1	-	-	-	-	-	-	-	-	2	2	1
CO 2	3	2	1	1	-	-	-	-	-	-	1	-	1	2	2
CO 3	3	2	2	1	1	-	-	-	1	2	1	1	2	1	2
CO 4	3	2	1	1	1	-	1	1	2	2	2	2	2	1	2
CO 5	3	2	2	1	1	2	1	1	2	1	2	2	2	1	2
CO	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1

  
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YEAR	II	SEMESTER	III	L	T	P	C
COURSE CODE / COURSE TITLE	191EC311 / COMMUNICATION ENGINEERING			3	0	0	3

### Course Outcomes

At the end of the course, the student should be able to:

CO1	Ability to comprehend and appreciate the significance and role of this course in the present contemporary world
CO2	Apply analog and digital communication techniques.
CO3	Use data and pulse communication techniques.
CO4	Analyze Source and Error control coding.
CO5	Use Various Spectrum and Multiple access methods

### CO-PO & PSO Mapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO 1	3	3	2	2	-	-	-	-	-	-	-	1	2	2	1
CO 2	3	3	2	2	-	-	-	-	-	-	-	1	2	1	1
CO 3	3	3	2	2	-	-	-	-	-	-	-	1	1	1	1
CO 4	3	3	2	2	-	-	-	-	-	-	-	1	2	1	1
CO 5	3	3	2	2	-	-	-	-	-	-	-	1	2	1	1
CO	3	3	2	2	-	-	-	-	-	-	-	1	2	1	1

  
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YEAR	II	SEMESTER	III	L	T	P	C
COURSE CODE / COURSE TITLE	191CS32A / DATA STRUCTURE LABORATORY			0	0	2	1

### COURSE OUTCOMES

On completion of the course, students will be able to

CO1	Describe the basics of C programming language
CO2	Practice the concepts of functions, pointers, structures and unions for the given application.
CO3	Interpret and implement linear data structure operations in C.
CO4	Analyze and evaluate non linear data structure for the given application.
CO5	Apply the hashing concepts and choose the appropriate sorting algorithm for an application.

### CO-PO & PSO Mapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PS O3
CO1	3	3	3	2	-	1	1	1	1	2	-	3	3	2	3
CO2	3	3	3	2	-	1	1	1	1	2	-	3	3	2	3
CO3	3	3	3	2	-	1	1	1	1	2	-	3	3	2	3
CO4	3	3	3	2	-	1	1	1	1	2	-	3	3	2	3
CO5	3	3	3	2	-	1	1	1	1	2	-	3	3	2	3
CO	3	3	3	2	-	1	1	1	1	2	-	3	3	2	3

  
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YEAR	II	SEMESTER	III	L	T	P	C
COURSE CODE / COURSE TITLE	191CS32B / OBJECT ORIENTED PROGRAMMING LABORATORY			0	0	2	1

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.
CO2	Analyze the concept of function overloading, operator overloading, virtual functions and polymorphism.
CO3	Implement Java programs for simple applications that make use of classes, packages and interfaces.
CO4	Develop and implement Java programs with array list, exception handling and multithreading.
CO5	Design applications using file processing, generic programming and event handling.

CO-PO & PSO Mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	3	1	1	1	1	2	3	3	3	2	3
CO2	3	3	3	2	3	1	1	1	1	2	3	3	3	2	3
CO3	3	3	3	2	3	1	1	1	1	2	3	3	3	2	2
CO4	3	3	3	2	3	1	1	1	1	2	3	3	3	2	2
CO5	3	3	3	2	3	1	1	1	1	2	3	3	3	2	3
CO	3	3	3	2	3	1	1	1	1	2	3	3	3	2	2

  
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YEAR	II	SEMESTER	III	L	T	P	C
COURSE CODE / COURSE TITLE	191HS30A / ADVANCED READING AND WRITING SKILL LABORATORY			0	0	2	1

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Demonstrate understanding of elements of writing such as brainstorming for generating topic sentence, central ideas, supporting ideas, organization patterns, editing and drafting different types of paragraphs and essays.
CO2	Understand the strategies of skimming and scanning to read a text analytically and critically respond to it.
CO3	Apply critical thinking skills and infer a text logically in relation to various professional concerns.

CO-PO & PSO Mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	3	3	2	2	2	2	2
CO2	3	-	-	-	-	-	-	-	3	3	2	2	2	2	2
CO3	3	-	-	-	-	-	-	-	3	3	2	2	2	2	2
CO	3	-	-	-	-	-	-	-	3	3	2	2	2	2	2

  
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YEAR	II	SEMESTER	IV	L	T	P	C
COURSE CODE /COURSE TITLE	191MA403/DISCRETE MATHEMATICS			2	2	0	3

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Use logical notation to define and reason about fundamental mathematical concepts such as sets, relations, functions, and integers and apply it in their fields.
CO2	Apply counting principles and estimate probabilities and also to analyze algorithms and programs by recurrence relation.
CO3	Analyze the different types of graphs and hence know about the application of graph theory in their field.
CO4	Analyze the algebraic structures and their application
CO5	Evaluate Boolean functions and simplify expression using the properties of Boolean algebra.

Course Outcome	Mapping CO's with PO's														
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	2	2	1	-	-	-	-	-	-	1	3	1	1
CO2	3	3	2	2	1	-	-	-	-	-	-	1	3	1	1
CO3	3	3	2	2	1	-	-	-	-	-	-	1	3	1	1
CO4	3	3	2	2	1	-	-	-	-	-	-	1	3	1	1
CO5	3	3	2	2	1	-	-	-	-	-	-	1	3	1	1
CO	3	3	2	2	1	-	-	-	-	-	-	1	3	1	1

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YEAR	II	SEMESTER	IV	L	T	P	C
COURSE CODE / COURSE TITLE	191CS421/DESIGN AND ANALYSIS OF ALGORITHMS			3	0	0	3

### COURSE OUTCOMES

On completion of the course, students will be able to

CO1	Remember the fundamental needs of algorithms in problem solving
CO2	Identify the Design algorithm for various computing problems
CO3	Apply the different algorithm design techniques for a given problem
CO4	Analyze the existing algorithm to improve efficiency
CO5	Evaluate the time and space complexity of various algorithms

### CO-PO & PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	1	-	-	-	-	-	-	-	1	2	2	1
CO2	3	3	2	1	-	-	-	-	-	-	-	1	2	2	1
CO3	3	3	2	1	-	-	-	-	-	2	1	1	2	2	1
CO4	3	3	2	2	-	-	1	-	-	2	1	1	1	1	1
CO5	2	2	1	1	-	-	1	-	-	2	2	1	1	1	1
CO	3	3	2	1	-	-	1	-	-	2	1	1	2	2	1

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YEAR	II	SEMESTER	IV	L	T	P	C
COURSE CODE /COURSE TITLE	191CS422/DATABASEMANAGEMENTSYSTEMS			3	0	0	3

### COURSE OUTCOMES

On completion of the course, students will be able to

CO1	Remember the modern and futuristic database applications based on size and complexity
CO2	Identify and Map ER model to Relational model to perform database design effectively
CO3	Apply queries using normalization criteria and optimize queries
CO4	Analyze contrast various indexing strategies in different database systems
CO5	Evaluate how advanced databases differ from traditional databases

### CO- PO & PSO Mapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO 1	3	2	1	1	1	1	-	1	1	-	-	1	1	1	1
CO 2	3	2	2	1	-	1	1	1	1	-	-	2	1	1	1
CO 3	3	2	2	1	2	1	1	1	-	-	-	1	2	2	1
CO 4	3	2	2	2	2	1	1	-	-	-	-	2	2	2	2
CO 5	3	3	2	2	1	2	2	1	2	2	2	2	2	2	2
CO	3	2	2	2	2	1	1	1	1	2	2	2	2	2	1

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YEAR	II	SEMESTER	IV	L	T	P	C
COURSE CODE / COURSE TITLE	191CS423/OPERATING SYSTEMS			3	0	0	3


### COURSE OUTCOMES

On completion of the course, students will be able to

CO1	Describe the Basic Concepts and functions of OS and Process.
CO2	Compare the various scheduling algorithms and Understand deadlock, prevention and avoidance algorithms.
CO3	Distinguish various memory management schemes.
CO4	Analyse the functionality of file systems
CO5	Review the administrative tasks on Linux Servers and to Compare iOS and Android Operating Systems

### CO-PO & PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	1	1	-	-	-	-	-	-	1	2	2	2
CO2	3	3	3	2	2	-	-	-	-	-	-	1	3	3	2
CO3	3	3	3	2	2	-	-	-	-	-	-	1	3	3	2
CO4	3	3	3	3	2	-	-	-	-	-	-	1	3	2	2
CO5	3	3	3	3	3	2	2	2	1	1	2	2	3	3	3
CO	3	3	3	2	2	2	2	2	1	1	2	1	3	3	2

  
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YEAR	II	SEMESTER	IV	L	T	P	C
COURSE CODE / COURSE TITLE	191CS424 / COMPUTER NETWORKS			3	0	0	3

### COURSE OUTCOMES

On completion of the course, students will be able to

CO1	Identify the basic layers and its functions in Computer networks and the working of various application layer protocols.
CO2	Compare the performance of a network.
CO3	Discuss the basics of how data flows from one node to another.
CO4	Analyze and design routing algorithms.
CO5	Design protocols for various functions in the network.

### CO-PO & PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1	1	1	-	-	-	-	1	1	3	2	1
CO2	3	2	2	1	1	-	-	-	-	-	1	1	3	2	1
CO3	3	2	2	1	1	1	-	-	-	-	1	1	-	-	1
CO4	3	2	2	1	-	1	-	-	-	-	1	1	3	2	1
CO5	3	2	2	2	-	2	1	-	1	-	1	1	3	2	1
CO	3	2	2	1	1	1	1	-	1	-	1	1	3	2	1

  
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YEAR	II	SEMESTER	IV	L	T	P	C
COURSE CODE / COURSE TITLE	191CS425 / THEORY OF COMPUTATION			3	0	0	3

### COURSE OUTCOMES

On completion of the course, students will be able to

CO1	Construct automata, regular expression for any pattern.
CO2	Write Context free grammar for any construct.
CO3	Design Turing machines for any language.
CO4	Propose computation solutions using Turing machines.
CO5	Derive whether a problem is decidable or not.

### CO-PO & PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	1	1	-	-	-	-	-	-	2	1	2	1	1
CO2	3	3	2	1	-	-	-	-	-	-	2	2	2	2	1
CO3	3	2	2	1	-	-	-	-	-	-	1	1	1	1	1
CO4	3	3	2	1	-	-	-	-	-	-	2	1	2	1	1
CO5	3	2	1	1	-	-	-	-	-	-	2	2	2	1	1
CO	3	2	2	1	-	-	-	-	-	-	2	1	2	1	1

  
COURSE IN-CHARGE (S)

  
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Department of  
Computer Science and Engineering  
VEL TECH MULTI TECH  
Dr. Rangarajan Dr. Sakunthala Engg. College  
Avadi, Chennai - 600 062.

YEAR	II	SEMESTER	IV	L	T	P	C
COURSE CODE /COURSE TITLE	191CS42A/ DATABASE MANAGEMENT SYSTEMS LABORATORY			0	0	2	1

### COURSE OUTCOMES

On completion of the course, students will be able to

CO1	Remember typical data definitions and manipulation commands.
CO2	Identify the design applications to test Nested and Join Queries.
CO3	Apply simple applications that use Views.
CO4	Analyze applications that require a Front-end Tool.
CO5	Evaluate and analyze the use of Tables, Views, Functions and Procedures.

### CO-PO&PSO Mapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO 1	3	2	2	1	-	1	-	-	-	-	1	1	3	2	1
CO 2	3	2	2	1	-	1	-	-	-	-	1	1	2	3	1
CO 3	3	2	2	2	-	1	-	-	-	-	1	1	2	2	2
CO 4	3	2	2	2	2	2	-	-	-	-	1	1	1	2	1
CO 5	3	2	2	2	2	2	-	-	-	-	1	1	1	2	2
CO	3	2	2	2	2	1	-	-	-	-	1	1	2	2	1

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 Avadi, Chennai - 600 062.

YEAR	II	SEMESTER	IV	L	T	P	C
COURSE CODE / COURSE TITLE	191CS42B/ OPERATING SYSTEMS LABORATORY			0	0	2	1

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Compare the performance of various CPU Scheduling Algorithms.
CO2	Implement Deadlock avoidance and Detection Algorithms.
CO3	Demonstrate Semaphores.
CO4	Create processes and implement IPC.
CO5	Analyze the performance of the various Page Replacement Algorithms and Implement File Organization and File Allocation Strategies

CO-PO & PSO Mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	2	2	2	2	2	2	2	2	3	2	2
CO2	3	3	3	2	2	2	2	2	2	2	2	2	3	2	2
CO3	3	3	3	2	2	2	2	2	2	2	2	2	3	2	2
CO4	3	3	3	2	2	2	2	2	2	2	2	2	3	2	2
CO5	3	3	3	2	2	2	2	2	2	2	2	2	3	2	2
CO	3	3	3	2	2	2	2	2	2	2	2	2	3	2	2

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YEAR	II	SEMESTER	IV	L	T	P	C
COURSE CODE / COURSE TITLE	191CS42C / NETWORKS LABORATORY			0	0	2	1


### COURSE OUTCOMES

On completion of the course, students will be able to

CO1	Identify various protocols using TCP and UDP.
CO2	Compare the performance of different transport layer protocols.
CO3	Use simulation tools to measure the performance of various network protocols.
CO4	Implement various routing algorithms.
CO5	Interpret error correction codes.

### CO-PO & PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	2	1	1	-	1	1	1	1	3	2	2
CO2	3	3	3	3	2	2	2	-	1	1	1	1	3	2	2
CO3	3	3	3	3	3	2	1	-	1	1	1	1	3	2	2
CO4	3	3	3	3	3	2	2	-	1	1	1	1	3	2	2
CO5	3	3	3	3	3	1	1	-	1	1	1	1	3	2	2
CO	3	3	3	3	3	2	2		1	1	1	1	3	2	2

  
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Avadi, Chennai - 600 062.

YEAR	III	SEMESTER	V	L	T	P	C
COURSE CODE / COURSE TITLE	191MA501/ NUMERICAL METHODS AND NUMBER THEORY			2	2	0	3

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Apply Numerical methods to find the solutions of algebraic equations.
CO2	Work out numerical differentiation and numerical integration whenever routine methods are not applicable.
CO3	Prove results involving divisibility and greatest common divisors.
CO4	Find integral solutions to specified linear Diophantine equations.
CO5	Apply Wilson's theorem and Fermat's theorem to prove relations involving prime numbers.

CO	Mapping CO's with PO's														
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	2	2	1	-	-	-	-	-	-	1	3	1	1
CO2	3	3	2	2	1	-	-	-	-	-	-	1	3	1	1
CO3	3	3	2	2	1	-	-	-	-	-	-	1	3	1	1
CO4	3	3	2	2	1	-	-	-	-	-	-	1	3	1	1
CO5	3	3	2	2	1	-	-	-	-	-	-	1	3	1	1
CO	3	3	2	2	1	-	-	-	-	-	-	1	3	1	1

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COURSE IN-CHARGE(S)

*W. L. K.*  
HOD

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Dr. Rangarajan Dr. Sakunthala Engg. College  
Avadi, Chennai - 600 032

YEAR	III	SEMESTER	V	L	T	P	C
COURSE CODE / COURSE TITLE	191EC511 / MICROPROCESSORS AND MICROCONTROLLERS			3	0	0	3

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Understand and execute programs based on 8086 microprocessor.
CO2	Design Memory Interfacing circuits.
CO3	Design and interface I/O circuits.
CO4	Apply 8051 microcontroller based systems.
CO5	Analyze the Programming 8051 timers.

CO-PO & PSO Mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	2	-	-	-	-	-	-	-	-	2	2	3
CO2	3	3	2	2	-	-	-	-	-	-	-	-	2	2	3
CO3	3	3	3	2	-	-	-	-	-	-	-	-	2	2	2
CO4	3	3	2	1	-	-	-	-	-	-	-	-	2	2	3
CO5	3	3	3	2	-	-	-	-	1	1	2	2	3	3	3
CO	3	3	3	2	-	-	-	-	1	1	2	2	2	2	3

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COURSE IN-CHARGE(S)

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Avadi, Chennai - 600 062.



YEAR	III	SEMESTER	V	L	T	P	C
COURSE CODE / COURSE TITLE	191CS531 / BIG DATA ANALYTICS			3	0	0	3

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Describe the big data tools and its analysis techniques.
CO2	Identify the data by utilizing clustering and classification algorithms.
CO3	Apply different mining algorithms and recommendation systems for large volumes of data.
CO4	Analyze the data streaming methods
CO5	Investigate NoSQL databases and management

CO-PO Mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	2	1	1	1	-	-	-	-	2	2	2
CO2	3	3	2	2	2	1	1	1	-	-	-	1	-	2	-
CO3	3	3	2	2	1	1	1	1	1	-	-	1	2	-	2
CO4	3	2	2	2	2	1	1	1	1	1	1	1	2	2	2
CO5	3	2	2	2	2	1	1	1	1	1	1	1	2	2	1
CO	3	3	2	2	2	1	1	1	1	1	1	1	2	2	2

  
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YEAR	III	SEMESTER	V	L	T	P	C
COURSE CODE / COURSE TITLE	191CS536 / SOFTWARE TESTING			3	0	0	3

On completion of the course, students will be able to	
CO	COURSE OUTCOMES
CO1	Design test cases suitable for a software development for different domains.
CO2	Identify suitable tests to be carried out.
CO3	Prepare test planning based on the document.
CO4	Document test plans and test cases designed.
CO5	Make use of the latest test tool for functional and performance testing.

CO-PO & PSO Mapping															
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	3	3	3	3	2	2	2	2	3	3	3	3	3	3	3
CO2	3	3	3	3	2	2	2	2	3	3	3	3	3	3	3
CO3	3	3	3	3	2	2	2	2	3	3	3	3	3	3	3
CO4	3	3	3	3	2	2	2	2	3	3	3	3	3	3	3
CO5	3	3	3	3	2	2	2	2	3	3	3	3	3	3	3
CO	3	3	3	3	2	2	2	2	3	3	3	3	3	3	3

  
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Dr. Rangarajan Dr. Sakthi Mala Engg. College  
Avadi, Chennai-600 062.

YEAR	III	SEMESTER	V	L	T	P	C
COURSE CODE / COURSE TITLE	191CS532 / COMPUTER GRAPHICS			3	0	0	3

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Define two dimensional graphics.
CO2	Design two dimensional transformations and three dimensional graphics
CO3	Apply two dimensional transformations and three dimensional graphics
CO4	Implement clipping techniques to graphics.
CO5	Outline types of Multimedia File Format and Design Basic 3d Scenes using Blender

CO-PO & PSO Mapping															
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	3	3	3	2	1	-	-	-	-	-	2	-	3	2	2
CO2	3	3	3	2	2	-	-	-	-	-	-	1	3	2	2
CO3	3	3	3	2	2	-	-	-	-	-	1	-	3	2	2
CO4	3	3	3	2	2	-	-	-	-	-	2	2	3	2	2
CO5	3	3	3	2	2	-	-	-	-	1	2	1	3	2	2
CO	3	3	3	2	2	-	-	-	-	1	2	2	3	2	2

  
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Dr. Rangarajan Dr. Sakunthala Engg. College  
Avadi, Chennai - 600 062.



YEAR	III	SEMESTER	V	L	T	P	C
COURSE CODE / COURSE TITLE	191CS539 / INTERNET OF THINGS			3	0	0	3

On completion of the course, students will be able to		COURSE OUTCOMES
CO1	Explain the concept of IoT.	
CO2	Analyze various protocols for IoT.	
CO3	Design a Portable of an IoT system using Raspberry Pi/Arduino.	
CO4	Deploy an IoT application and connect to the cloud.	
CO5	Analyze applications of IoT in real time scenario.	

CO-PO & PSO Mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	-	1	-	-	-	-	-	1	3	2	1
CO2	3	3	1	1	-	1	-	-	-	-	-	1	3	2	1
CO3	3	3	1	1	1	1	-	-	-	-	-	1	3	2	1
CO4	3	3	1	1	1	1	-	-	-	-	-	1	3	2	1
CO5	3	3	1	1	1	1	-	-	-	-	-	1	3	2	1
CO	3	3	1	1	1	1	-	-	-	-	-	1	3	2	1

  
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Computer Science and Engineering  
VEL TECH MULTI TECH  
Dr. Rangarajan Dr. S. Senthil Engg. College  
Avadi, Chennai-600 062.

YEAR	III	SEMESTER	V	L	T	P	C
COURSE CODE / COURSE TITLE	191CS5310/MACHINE LEARNING TECHNIQUES			3	0	0	3

On completion of the course, students will be able to		COURSE OUTCOMES
CO1	Recall the learning techniques with this basic knowledge.	
CO2	Define effectively neural network and genetic algorithm for appropriate applications.	
CO3	Apply Bayesian techniques and derive effectively learning rules.	
CO4	Analyze the different machine learning techniques.	
CO5	Differentiate reinforcement and analytical learning techniques.	

CO-PO & PSO Mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1	-	-	-	-	1	-	-	1	3	2	2
CO2	3	2	2	1	-	-	-	-	1	-	-	1	3	2	2
CO3	3	2	2	1	-	-	-	-	1	-	-	1	3	2	2
CO4	3	2	2	1	-	-	-	-	1	-	-	1	3	2	2
CO5	3	2	3	1	1	-	-	-	1	-	-	1	3	2	2
CO	3	2	2	1	1	-	-	-	1	-	-	1	3	2	2

  
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Computer Science and Engineering  
VEL TECH MULTI TECH  
Dr. Rangarajan Dr. Sakunthala Engg. College  
Avadi, Chennai-600 062.

YEAR	III	SEMESTER	V	L	T	P	C
COURSE CODE /COURSE TITLE	191HS50A /PROFESSIONAL COMMUNICATION			3	0	0	3

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Equip students with technology driven language skills required for successful undertaking of academic studies with primary emphasis on academic speaking and listening and to prepare students for competitive exams.
CO2	Identify different genres of reading and writing, and be able to reflect and respond critically on formal communication such as letters, reports and memos.
CO3	Learn to understand the role of multiple intelligences and incorporate them in communication in a diverse team.

CO-PO & PSO Mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	3	3	2	2	3	-	-
CO2	3	-	-	-	-	-	-	-	3	3	2	2	3	-	-
CO3	3	-	-	-	-	-	-	-	3	3	2	2	3	-	-
CO	3	-	-	-	-	-	-	-	3	3	2	2	3	-	-

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 Dr. Rangarajan Dr. Sakunthala Engg. College  
 Avadi, Chennai - 600 062.



YEAR	III	SEMESTER	V	L	T	P	C
COURSE CODE / COURSE TITLE	191EC51A / MICROPROCESSORS AND MICROCONTROLLERS LABORATORY			3	0	0	3

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Write ALP Program's for fixed and Floating Point and Arithmetic operations
CO2	Interface different I/Os with processor
CO3	Generate waveforms using Microprocessors
CO4	Execute Programs in 8051.
CO5	Explain the difference between simulator and Emulator.

CO-PO & PSO Mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	2	1	1	-	1	1	1	1	3	2	2
CO2	3	3	3	3	2	2	2	-	1	1	1	1	3	2	2
CO3	3	3	3	3	3	2	1	-	1	1	1	1	3	2	2
CO4	3	3	3	3	3	2	2	-	1	1	1	1	3	2	2
CO5	3	3	3	3	3	2	2	-	1	1	1	1	3	2	2
CO	3	3	3	3	3	2	2		1	1	1	1	3	2	2

  
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TECH MULTITECH  
Dr. Rangaswamy Sankunthala Engg. College  
Avalahalli - 600 062.

YEAR	III	SEMESTER	V	L	T	P	C
COURSE CODE / COURSETITLE	191CS52A / MOBILE APPLICATION DEVELOPMENT LABORATORY			0	0	2	1

### COURSE OUTCOMES


On completion of the course, students will be able to

CO1	Design the mobile applications using GUI and Layouts.
CO2	Appraise mobile applications using Event Listener.
CO3	Practice the mobile applications using Databases.
CO4	Apply mobile applications using RSS Feed, Internal/External Storage, SMS, Multithreading and GPS.
CO5	Create the own mobile app for simple needs.

### CO-PO & PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	1	-	-	-	-	-	-	3	2	-
CO2	3	3	3	3	3	1	-	-	-	-	-	-	3	2	-
CO3	3	3	3	3	3	3	-	-	-	-	-	-	3	2	-
CO4	3	3	3	3	3	1	-	-	-	-	-	-	3	2	-
CO5	3	3	3	3	3	1	-	-	-	-	-	-	3	2	-
CO	3	3	3	3	3	3	-	-	-	-	-	-	3	2	-

  
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Computer Engineering  
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Dr. Rangarajan  
Aradhya College of Engineering  
Autonomous - 500 062

YEAR	III	SEMESTER	VI	L	T	P	C
COURSE CODE / COURSE TITLE	191CS623 / ARTIFICIAL INTELLIGENCE			3	0	0	3

### COURSE OUTCOMES

On completion of the course, students will be able to

CO1	Discuss agent types with its characteristics.
CO2	Apply appropriate search algorithms for any AI problem
CO3	Represent a problem using first order and predicate logic
CO4	Design software agents to solve a problem
CO5	Develop applications for NLP that use Artificial Intelligence..

### CO-PO & PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	2	1	1	1	1	-	-	1	1	2	1	2
CO2	3	3	2	2	2	1	-	-	1	1	2	1	2	1	1
CO3	3	3	2	2	1	1	1	-	-	-	2	1	2	2	2
CO4	2	2	2	1	1	1	-	-	-	1	1	1	2	1	2
CO5	3	2	2	2	1	1	1	-	1	1	1	1	3	2	2
CO	3	2	2	2	1	1	1	1	-	-	1	1	2	1	2

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YEAR	III	SEMESTER	VI	L	T	P	C
COURSE CODE / COURSE TITLE	191CS621 / INTERNET PROGRAMMING			3	0	0	3

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Explain the basic web essential terms using HTML and Cascading Style Sheets.
CO2	Discuss the creation of dynamic web page with validation using Java Script objects.
CO3	Create the server side programs using Servlets and JSP.
CO4	Construct simple web pages in PHP and represent data in XML format.
CO5	Develop AJAX , web services and various interactive web applications.

CO-PO & PSO Mapping															
CO	P O1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO 1	3	3	3	-	-	-	-	3	3	3	-	3	3	3	3
CO 2	3	3	3	-	-	-	-	3	3	3	-	3	3	3	3
CO 3	3	3	3	-	-	-	-	3	3	3	-	3	3	3	3
CO 4	3	3	3	-	-	-	-	3	3	3	-	3	3	3	3
CO 5	3	3	3	-	-	-	-	3	3	3	-	3	3	3	3
CO	3	3	3	-	-	-	-	3	3	3	-	3	3	3	3

  
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Avadi, Chennai - 600 062.

YEAR	III	SEMESTER	VI	L	T	P	C
COURSE CODE / COURSE TITLE	191HS101 / COMPILER DESIGN			3	0	0	3

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Acquire knowledge in different phases and passes of Compiler, and specifying different types of tokens by lexical analyzer.
CO2	Illustrate the translation of regular expression into parse tree using syntax analyzer and use the Compiler tools.
CO3	Practice about the top-down parsing and bottom-up parsing and able to construct parse table.
CO4	Able to translate the statement and implement the storage allocation strategies.
CO5	Analyze the various optimization techniques.

CO-PO & PSO Mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	2	2	1	1	-	1	1	1	3	2	-
CO2	3	3	3	2	2	2	2	1	-	1	1	2	3	-	2
CO3	3	3	3	2	2	2	2	-	-	1	1	2	3	2	2
CO4	3	3	3	2	2	2	1	-	-	1	1	2	3	2	-
CO5	3	3	3	2	2	2	1	1	-	1	1	2	3	2	2
CO	3	3	3	2	2	2	2	1	-	1	1	2	3	2	2

COURSE IN-CHARGE (S)

HOD

**HEAD OF THE DEPARTMENT**  
 Department of  
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 VEL TECH MULTI TECH  
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 Avadi, Chennai - 600 062.



YEAR	III	SEMESTER	VI	L	T	P	C
COURSE CODE / COURSE TITLE	191HS50A / COMPILER DESIGN LABORATORY			0	0	2	1

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Analyse the different compiler writing tools to implement the different Phases.
CO2	Design the data flow and control flow.
CO3	Develop the intermediate representation.
CO4	Construct the back end of a compiler for 8086 assembler.
CO5	Compare various code optimization techniques.

CO - PO & PSO Mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	2	1	-	-	-	-	1	3	3	2
CO2	3	3	3	3	2	1	-	-	-	-	-	1	3	3	1
CO3	3	3	3	3	2	1	-	-	-	-	-	1	3	3	1
CO4	3	3	3	3	3	1	-	-	1	-	-	1	3	3	1
CO5	3	3	3	3	2	1	1	-	-	-	-	1	3	3	1
CO	3	3	3	3	2	1	1	-	1	-	-	1	3	3	1

  
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YEAR	III	SEMESTER	VI	L	T	P	C
COURSE CODE / COURSE TITLE	191CS632 / C# AND .NET PROGRAMMING			3	0	0	3

On completion of the course, students will be able to		COURSE OUTCOMES
CO1	Remember various applications using C# Language in the .NET Framework.	
CO2	Identify advanced features of .NET Framework.	
CO3	Apply mobile applications using .NET compact Framework.	
CO4	Analyze web applications using a combination of client-side and server-side technologies.	
CO5	Evaluate experiment with the deployment of enterprise applications	

CO-PO & PSO Mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS O1	PSO2	PS O3
CO1	3	2	1	1	-	-	-	-	-	1	-	-	2	1	1
CO2	3	2	2	1	-	-	-	-	-	1	-	-	2	2	1
CO3	3	3	2	1	1	1	-	-	1	1	-	-	2	1	2
CO4	3	3	2	1	1	1	1	2	2	1	2	2	3	2	2
CO5	3	3	2	1	1	1	1	2	2	1	2	2	3	2	2
CO	3	2	1	1	1	1	1	2	1	1	1	2	2	1	1

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YEAR	III	SEMESTER	VI	L	T	P	C
COURSE CODE / COURSE TITLE	191CS635 /HUMAN COMPUTER INTERACTION			3	0	0	3

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Design effective dialog for HCI.
CO2	Design effective HCI for individuals and persons with disabilities.
CO3	Assess the importance of user feedback.
CO4	Explain the HCI implications for designing multimedia/ ecommerce/ e-learning Web sites.
CO5	Develop meaningful user interface.

CO-PO & PSO Mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	2	1	1	1	-	-	2	2	2	3	2
CO2	3	3	2	2	1	2	1	-	1	-	2	1	3	2	2
CO3	3	3	3	2	2	-	-	-	1	-	2	2	2	2	2
CO4	3	3	3	2	2	-	-	-	-	-	2	2	3	2	2
CO5	3	3	3	2	2	2	-	-	-	-	2	2	3	2	2
CO	3	3	3	2	2	1	1	-	1	-	2	2	3	2	2

*V. Vijaya*  
COURSE IN-CHARGE (S)

*M. R.*  
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YEAR	III	SEMESTER	V	L	T	P	C
COURSE CODE / COURSE TITLE	191CS521 / MOBILE COMPUTING			3	0	0	3

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	State the basics of mobile telecommunication systems.
CO2	Illustrate the generations of telecommunication systems in wireless networks.
CO3	Reiterate the functionality of MAC, network layer and Identify a routing protocol for a given Ad hoc network.
CO4	Discuss the functionality of Transport and Application layers.
CO5	Construct the mobile application using android/blackberry/ios/Windows SDK.

CO-PO & PSO Mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS O1	PS O2	PS O3
CO1	3	2	2	2	1	-	-	-	-	-	-	-	2	2	3
CO2	3	3	2	2	2	1	1	-	-	-	-	-	2	2	3
CO3	3	3	3	2	2	2	2	-	-	-	-	-	2	2	2
CO4	3	3	2	1	1	1	1	1	-	-	-	-	2	2	3
CO5	3	3	3	2	2	2	2	1	1	1	1	1	3	3	3
CO	3	3	3	2	3	2	2	1	1	1	1	1	2	2	3

  
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YEAR	III	SEMESTER	VI	L	T	P	C
COURSE CODE / COURSE TITLE	191HS50A / INTERNET PROGRAMMING LABORATORY			0	0	2	1

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Explain the basic web essential terms using HTML and Cascading Style Sheets.
CO2	Discuss the creation of dynamic web page with validation using Java Script objects.
CO3	Create the server side programs using Servlets and JSP.
CO4	Construct simple web pages in PHP and represent data in XML format.
CO5	Develop AJAX , web services and various interactive web applications.

CO-PO & PSO Mapping															
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	3	2	2	2	3	2	2	3	3	3	3	3	3	2	2
CO2	3	2	2	2	3	2	2	3	3	3	3	3	3	2	2
CO3	3	2	2	2	3	2	2	3	3	3	3	3	3	2	2
CO4	3	2	2	2	3	2	2	3	3	3	3	3	3	2	2
CO5	3	2	2	2	3	2	2	3	3	3	3	3	3	2	2
CO	3	2	2	2											

COURSE IN-CHARGE (S)

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 Avadi, Chennai -600 062.

YEAR	IV	SEMESTER	VII	L	T	P	C
<b>COURSE CODE / COURSE TITLE</b>	<b>191CS721 / CRYPTOGRAPHY AND NETWORK SECURITY</b>			<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

COURSE OUTCOMES	
On completion of the course, students will be able to	
<b>CO1</b>	Interpret the fundamentals of networks security, security architecture, threats and vulnerabilities.
<b>CO2</b>	Analyze the different cryptographic operations of symmetric cryptographic algorithms.
<b>CO3</b>	Identify the commonly used cryptographic operations of public key cryptography.
<b>CO4</b>	Demonstrate the various Authentication schemes to simulate different applications.
<b>CO5</b>	Articulate various Security practices and System security standards.

CO-PO & PSO Mapping															
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
<b>CO 1</b>	3	2	2	1	-	-	-	-	-	-	1	-	2	2	1
<b>CO 2</b>	2	2	2	1	-	-	-	-	-	-	-	1	3	2	1
<b>CO 3</b>	3	2	2	2	-	-	-	-	-	-	1	-	2	2	1
<b>CO 4</b>	3	3	2	1	-	-	-	-	-	-	2	2	3	2	2
<b>CO 5</b>	3	2	2	1	-	-	-	-	-	-	2	1	2	1	1
<b>CO</b>	3	2	2	1	-	-	-	-	-	-	2	1	2	2	1

<b>YEAR</b>	<b>IV</b>	<b>SEMESTER</b>	<b>VII</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>YEAR</b>	<b>IV</b>	<b>SEMESTER</b>	<b>VII</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>COURSE CODE / COURSE TITLE</b>	<b>191CS72A / SECURITY LABORATORY</b>			<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>

<b>COURSE OUTCOMES</b>	
On completion of the course, students will be able to	
<b>CO1</b>	Identify the use of programming languages to implement Symmetric cryptograph
<b>CO2</b>	Build cryptosystems by applying symmetric and public key encryption algorithms.
<b>CO3</b>	Construct code for authentication algorithms.
<b>CO4</b>	Develop a signature scheme using Digital signature standard.
<b>CO5</b>	Demonstrate the network security system using open source tools.

<b>CO-PO &amp; PSO Mapping</b>															
<b>CO</b>	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>	<b>PO 7</b>	<b>PO 8</b>	<b>PO 9</b>	<b>PO10</b>	<b>PO1 1</b>	<b>PO1 2</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>
<b>CO 1</b>	3	2	1	1	-	-	-	-	-	-	2	1	2	1	1
<b>CO 2</b>	3	2	2	1	-	-	-	-	-	-	2	2	2	2	1
<b>CO 3</b>	3	3	2	1	-	-	-	-	-	-	1	1	2	1	1
<b>CO 4</b>	3	2	2	1	-	-	-	-	-	-	2	1	2	2	1
<b>CO 5</b>	2	2	1	1	-	-	-	-	-	-	2	2	1	1	1
<b>CO</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>



<b>COURSE CODE / COURSE TITLE</b>	<b>191CS722 / CLOUD COMPUTING</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
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<b>COURSE OUTCOMES</b>	
On completion of the course, students will be able to	
<b>CO1</b>	Discuss the architectural concepts, key technologies, strengths and limitations of cloud computing.
<b>CO2</b>	Apply the concept of virtualization in cloud technology
<b>CO3</b>	Analyze the ability to understand and use the architecture of compute and storage cloud, service and delivery models.
<b>CO4</b>	Construct appropriate resource management and Security mechanism to build a cloud environment
<b>CO5</b>	Develop operation and economic models of various trending cloud platforms

<b>CO-PO &amp; PSO Mapping</b>															
<b>CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
<b>CO1</b>	3	2	2	1	-	-	-	-	-	-	-	1	2	-	-
<b>CO2</b>	3	2	2	1	-	-	-	-	-	-	-	1	2	-	-
<b>CO3</b>	3	2	2	2	1	-	-	-	-	-	-	1	2	-	-
<b>CO4</b>	3	2	2	1	-	-	-	-	-	-	-	1	2	-	-
<b>CO5</b>	3	2	2	1	1	-	-	-	-	-	-	1	2	-	-
<b>CO</b>	3	2	2	1	1	-	-	-	-	-	-	1	2	-	-

YEAR	IV	SEMESTER	VII	L	T	P	C
COURSE CODE / COURSE TITLE	191CS72B / CLOUD COMPUTING LABORATORY			0	0	2	1

COURSE OUTCOMES	
On completion of the course, students will be able to	
CO1	Install various virtualization tools such as Virtual Box, VMware workstation.
CO2	Use Cloud SIM to run a various scheduler
CO3	Design a web application in a IaaS environment.
CO4	Develop a generic cloud environment which can be used as a private cloud
CO5	Implement version control systems with various command repositories

CO-PO & PSO Mapping															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	1	1	1	-	-	-	-	-	-	-	2	2	2
CO2	2	1	1	1	1	-	-	-	-	-	-	1	-	2	-
CO3	2	1	1	1	1	1	-	-	1	-	-	1	2	-	2
CO4	3	2	2	1	1	1	--	-	-	-	-	-	2	2	2
CO5	2	1	1	1	1	1	1	-	-	-	-	-	2	2	1
CO	3	1	1	1	1	1	1	-	1	-	-	1	2	2	2

MAPPING	LOW/MEDIUM/HIGH	JUSTIFICATION
CO1 – PO1	MEDIUM	Installation of Virtualbox/VMware Workstation with different flavours of Linux or Windows OS on top of windows 7 or 8 discussed as per the program outcome engineering knowledge
CO1 – PO2	LOW	The concept of virtualization in cloud computing is discussed and it is slightly mapped with problem analysis outcome.
CO1 – PO3	LOW	Understand about the architecture of compute and storage cloud, service and delivery models. It is moderately mapped with designing aspects of program outcome.
CO1 - PO4	LOW	Study about the basic architecture of cloud is marginally mapped with complex engineering solutions.
CO1 – PO5	LOW	The implementation of Create hello world app and other simple web applications using python/java requires to use modern tools which is available in the market.
CO1-PSO1	MEDIUM	Understand about the GAE launcher to launch the web applications as per the program specific outcome.
CO1-PSO2	MEDIUM	Design and development of various schedulers with the use of cloud sim is practiced moderately
CO1-PSO3	MEDIUM	Understand about the architecture of compute and storage cloud, service and delivery models. It is moderately mapped with designing aspects of program specific outcome outcome.
CO2 – PO1	MEDIUM	The concept of virtualization in cloud requires to understand the basics of cloud architecture and related mathematical implementation.
CO2 – PO2	LOW	Marginally mapped as students can Simulate a cloud scenario using CloudSim
CO2 – PO3	LOW	Design and development aspect of various schedulers in cloud has been discussed and implemented.
CO2 – PO4	LOW	The complex problem involved in designing aspects of cloud architecture is investigated and tested.
CO2 – PO5	LOW	The implementation of cloud sim requires to use the modern tools which is available in the market.
CO2 – PO12	LOW	Marginally mapped as students understand the implementation of cloud sim and this may useful for their life long knowledge updation.CloudSim.



CO2 – PSO2	MEDIUM	Understand The concept of cloud sim requires to understand and formulation of problem.
CO3 – PO1	MEDIUM	Analyse the basic architecture of web development and it requires strong knowledge in fundamentals and mathematical concepts..
CO3 – PO2	LOW	Problem analysis skill is required to design a web development for real time applications.
CO3 – PO3	LOW	Design and development the basic architecture of web development and it requires strong knowledge in fundamentals and mathematical concepts .
CO3 – PO4	LOW	The complex problem involved in designing aspects of web development is investigated and tested.
CO3 – PO5	LOW	The implementation of web development requires modern tools requires to use the modern tools which is available in the market.
CO3 – PO6	LOW	Designing and development the basic architecture of web development and it requires to analyse the complex problem involved in it.
CO3 – PO9	LOW	Ability to function as an individual to design and develop web application in a IaaS environment.
CO3 – PO12	LOW	students can be able to understand the concept of web development as a lifelong learning Process for future implementation on cloud computing.
CO3 – PSO1	MEDIUM	Analyse the basic architecture of web development and it requires strong knowledge in fundamentals and mathematical concepts.
CO3 – PSO3	MEDIUM	Design and development the basic architecture of web development and it requires strong knowledge in fundamentals and mathematical concepts .
CO4– PO1	HIGH	Analyse the basic generic architecture of cloud and it requires strong knowledge in fundamentals and mathematical concepts..
CO4– PO2	MEDIUM	Problem analysis skill is required to design a generic cloud environment for real time applications.
CO4– PO3	MEDIUM	Design and development the basic architecture of generic cloud environment and it requires strong knowledge in fundamentals and mathematical concepts

CO4– PO4	LOW	The complex problem involved in designing aspects of generic cloud environment is investigated and tested.
CO4– PO5	LOW	The implementation of generic cloud environment requires modern tools requires to use the modern tools which is available in the market.
CO4– PO6	LOW	development of the basic architecture public cloud, private cloud, hybrid cloud and it requires to analyse the complex problem involved in it.
CO4– PSO1	MEDIUM	Analyse the basic architecture of web development and it requires strong knowledge in fundamentals and mathematical concepts.
CO4– PSO2	MEDIUM	Problem analysis skill is required to design a generic cloud environment for real time applications.
CO4– PSO3	MEDIUM	Design and development the basic architecture of generic cloud environment and it requires strong knowledge in fundamentals and mathematical concepts
CO5 – PO1	MEDIUM	Analyse the Implement version control systems with various command repositories..
CO5 – PO2	LOW	Problem analysis skill is required Implement version control systems with various command repositories
CO5 – PO3	LOW	Design and Implement version control systems with various command repositories and it requires strong knowledge in fundamentals and mathematical concepts .
CO5 – PO4	LOW	The complex problem involved in designing aspects control systems with various command repositories is investigated and tested.
CO5 – PO5	LOW	The implementation of control systems with various command repositories requires modern tools requires to use the modern tools which is available in the market.
CO5– PO6	LOW	Designing and development the control systems with various command repositories and it requires to analyse the complex problem involved in it.
CO5 – PO7	LOW	Students can Install a C compiler in the virtual machine created using virtual box and execute Simple Programs.
CO5 – PSO1	MEDIUM	Analyse the Implement version control systems with various command repositories..
CO5 – PSO2	MEDIUM	Problem analysis skill is required Implement version control systems with various command repositories
CO5 – PSO3	LOW	Design and Implement version control systems with various command repositories and it requires strong knowledge in fundamentals and mathematical concepts .

