SRI VASAVI INSTITUTE OF ENGINEERING & TECHNOLOGY
(Approved by AICTE, New Delhi & Affiliated to JNTU Kakinada)
Accredited by **NBA (Mech, ECE & CSE) & NAAC with 'A' Grade**
Nandamuru, Pedana Mandal, Krishna Dist – 521369.

Department of Science and Humanities

A:Y-2021-22 SEM-I Branch:CIVIL

At the end of the course student will be able to:

Mathematics-I

CO#	Course outcomes	BTL
C112.1	Use mean value theorems to real life problems	APPLY
C112.2	Apply differential equations to solve electrical circuits, chemical reactions, Newton's Law of cooling, natural growth and decay	APPLY
C112.3	Apply the second order differential equations for problems of electrical circuits.	APPLY
C112.4	Determine the total derivative, functional dependence and maxima and minima of functions of several variables by using partial differential coefficients.	UNDERSTAND
C112.5	Determine the area and volume of a given curve using double and triple integral	UNDERSTAND

ENGLISH

CO#	Course outcomes	BTL
C111.1	understand social or transactional dialogues spoken by native speakers of English and identify the context, topic, and pieces of specific information	Understand
C111.2	ask and answer general questions on familiar topics and introduce oneself/others.	Remember
C111.3	employ suitable strategies for skimming and scanning to get the general idea of a text and locate specific information	Apply
C111.4	recognize paragraph structure and be able to match beginnings/endings/headings with paragraphs.	Undestand
C111.5	form sentences using proper grammatical structures and correct word forms.	Analyze

ENGINEERING PHYSICS

CO#	Course outcomes	BTL
C113.1	Analyze the difference between interference and diffraction. Analyze ordinary and Extraordinary polarized light.	Analyze
C113.2	Understand the basic concepts of LASER. Explain working principle of optical fibers.	Understand
C113.3	Explain concept of polarization in dielectric materials and Magnetization in Magnetic materials.	Understand
C113.4	Explain sound propagation in buildings. Explain production of Ultrasonics.	Understand
C113.5	Explain various crystal systems and crystal structure by powder method and laue's method.	Understand

Engineering Drawing

CO#	Course outcomes	BTL
C114.1	Use drawing instruments and to draw polygons, Engg. Curves and Scales	**Apply**
C114.2	Draw and understand orthographic projections, projections of points & lines	**Apply**
C114.3	Draw the projections of the plane inclined to both the planes.	**Apply**
C114.4	Draw the projections of the various types of solids in different positions inclined to one of the planes.	**Apply**
C114.5	Visualize and convert the isometric view to orthographic view and vice versa.	**Apply**

Engineering Geology

CO#	Course outcomes	BTL
C115.1	Explain the importance of engineering geology in civil engineering and their branches	Understand
C115.2	Illustrate the different rocks and minerals properties	Analyse
C115.3	Explain geological failures	Understand
C115.4	Categories of Earthquakes and landslides	Anlyse
C115.5	Describe the types of dams and Identify the suitability of location for structures	Anlyse

HOD

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Department of Science and Humanities

A:Y-2020-2021 SEM-I Branch:MECH

Mathematics-I

CO#	Course Out come	BTL
C112.1	Use mean value theorems to real life problems	APPLY
C112.2	Apply differential equations to solve electrical circuits, chemical reactions, Newton's Law of cooling, natural growth and decay	APPLY
C112.3	Apply the second order differential equations for problems of electrical circuits.	APPLY
C112.4	Determine the total derivative, functional dependence and maxima and minima of functions of several variables by using partial differential coefficients.	UNDERSTAND
C112.5	Determine the area and volume of a given curve using double and triple integral	UNDERSTAND

ENGLISH

CO#	Course Out come	BTL
C111.1	understand social or transactional dialogues spoken by native speakers of English and identify the context, topic, and pieces of specific information.	Understand
C111.2	ask and answer general questions on familiar topics and introduce oneself/others.	Remember
C111.3	employ suitable strategies for skimming and scanning to get the general idea of a text and locate specific information.	Apply
C111.4	recognize paragraph structure and be able to match beginnings/endings/headings with paragraphs.	Undestand
C111.5	form sentences using proper grammatical structures and correct word forms.	Analyze

ENGINEERING PHYSICS

CO#	Course Out come	BTL
C113.1	Analyze the difference between interference and diffraction. Analyze ordinary and Extraordinary polarized light.	Analyze
C113.2	Understand the basic concepts of LASER. Explain working principle of optical fibers.	Understand
C113.3	Explain concept of polarization in dielectric materials and Magnetization in Magnetic materials.	Understand
C113.4	Explain sound propagation in buildings. Explain production of Ultrasonics.	Understand
C113.5	Explain various crystal systems and crystal structure by powder method and laue's method.	Understand

Programming for Problem Solving Using C

CO#	Course Out come	BTL
C114.1	**Explain** the basic fundamental concepts, like computer system, computing environment and structure of c program	**Understand**
C114.2	**Use** the different operators and decision making statement based on problem.	**Apply**
C114.3	Develop the programs by using derived data types like arrays, strings, structures and unions	**Apply**
C114.4	Explain about pointers, dynamic memory allocation and pre processor commands.	**Understand**
C114.5	Classify the different categories of functions and file I/O.	**Apply**

Engineering Drawing

CO#	Course Out come	BTL
C115.1	Use drawing instruments and to draw polygons, Engg. Curves and Scales	**Apply**
C115.2	Draw and understand orthographic projections, projections of points & lines	**Apply**
C115.3	Draw the projections of the plane inclined to both the planes.	**Apply**
C115.4	Draw the projections of the various types of solids in different positions inclined to one of the planes.	**Apply**
C115.5	Visualize and convert the isometric view to orthographic view and vice versa.	**Apply**

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Department of Science and Humanities

A:Y-2020-2021 SEM-I Branch:ECE

Mathematics-I

CO#	Course Outcome	BTL
C112.1	Use mean value theorems to real life problems.	APPLY
C112.2	Apply differential equations to solve electrical circuits, chemical reactions, Newton's Law of cooling, natural growth and decay	APPLY
C112.3	Apply the second order differential equations for problems of electrical circuits.	APPLY
C112.4	Determine the total derivative, functional dependence and maxima and minima of functions of several variables by using partial differential coefficients.	UNDERSTAND
C112.5	Determine the area and volume of a given curve using double and triple integral	UNDERSTAND

ENGLISH

CO#	Course Outcome	BTL
C111.1	understand social or transactional dialogues spoken by native speakers of English and identify the context, topic, and pieces of specific information.	Understand
C111.2	ask and answer general questions on familiar topics and introduce oneself/others.	Remember
C111.3	employ suitable strategies for skimming and scanning to get the general idea of a text and locate specific information.	Apply
C111.4	recognize paragraph structure and be able to match beginnings/endings/headings with paragraphs.	Undestand
C111.5	form sentences using proper grammatical structures and correct word forms.	Analyze

APPLIED CHEMISTRY

CO#	Course Outcome	BTL
C113.1	Explain the preparation, properties and applications of some plastic materials	Understand
C113.2	Explain the theory and construction of battery and fuel cells.	Understand
C113.3	Understand the importance of materials like nonmaterial's and fullerenes (Understand)	Understand
C113.4	Understand importance molecular machines	Understand
C113.5	Explain the different applications of analytical instruments	Understand

Programming for Problem Solving Using C

CO#	Course Outcome	BTL
C114.1	**Explain** the basic fundamental concepts, like computer system, computing environment and structure of c program	**Understand**
C114.2	**Use** the different operators and decision making statement based on problem.	**Apply**
C114.3	Develop the programs by using derived data types like arrays, strings, structures and unions	**Apply**
C114.4	Explain about pointers, dynamic memory allocation and pre processor commands.	**Understand**
C114.5	Classify the different categories of functions and file I/O.	**Apply**
C114.6	Develop the programs by using I/O files and use new tools	**Apply**

Engineering Drawing

CO#	Course Outcome	BTL
C114.1	Use drawing instruments and to draw polygons, Engg. Curves and Scales	**Apply**
C114.2	Draw and understand orthographic projections, projections of points & lines	**Apply**
C114.3	Draw the projections of the plane inclined to both the planes.	**Apply**
C114.4	Draw the projections of the various types of solids in different positions inclined to one of the planes.	**Apply**
C114.5	Visualize and convert the isometric view to orthographic view and vice versa.	**Apply**

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Department of Science and Humanities

A:Y-2020-2021 SEM-I Branch:CSE

Mathematics-I

C112.1	Use mean value theorems to real life problems	APPLY
C112.2	Apply differential equations to solve electrical circuits, chemical reactions, Newton's Law of cooling, natural growth and decay	APPLY
C112.3	Apply the second order differential equations for problems of electrical circuits.	APPLY
C112.4	Determine the total derivative, functional dependence and maxima and minima of functions of several variables by using partial differential coefficients.	UNDERSTAND
C112.5	Determine the area and volume of a given curve using double and triple integral	UNDERSTAND

ENGLISH

C111.1	understand social or transactional dialogues spoken by native speakers of English and identify the context, topic, and pieces of specific information)	Understand
C111.2	ask and answer general questions on familiar topics and introduce oneself/others. (Remember)	Remember
C111.3	employ suitable strategies for skimming and scanning to get the general idea of a text and locate specific information	Apply
C111.4	recognize paragraph structure and be able to match beginnings/endings/headings with paragraphs(Understand)	Undestand
C111.5	form sentences using proper grammatical structures and correct word forms	Analyze

APPLIED PHYSICS

C113.1	Analyze the difference between interference and diffraction.Analyze ordinary and Extraordinary polarized light.	Analyze
C113.2	Understand the basic concepts of LASER. Explain working principle of optical fibers.	Understand
C113.3	Explain the concept of dual nature of matter and concepts of classical and Quantum free electron theories.	Understand
C113.4	Explain concept of polarization in dielectric materials and Magnetization in Magnetic materials.	Understand
C113.5	Explain semiconductors and superconductivity property Materials.	Understand

Programming for Problem Solving Using C

C114.1	**Explain** the basic fundamental concepts, like computer system, computing environment and structure of c program	**Understand**
C114.2	**Use** the different operators and decision making statement based on problem.	**Apply**
C114.3	Develop the programs by using derived data types like arrays, strings, structures and unions	**Apply**
C114.4	Explain about pointers, dynamic memory allocation and pre processor commands.	**Understand**
C114.5	Classify the different categories of functions and file I/O.	**Apply**
C114.6	Develop the programs by using I/O files and use new tools	**Apply**

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Department of Science and Humanities

A:Y-2021-22 SEM-I Branch:AIML

Course outcome's summary

At the end of the course student will be able to:

ENGLISH

CO#	Course outcome	BTL
C111.1	understand social or transactional dialogues spoken by native speakers of English and identify the context, topic, and pieces of specific information)	Understand
C111.2	ask and answer general questions on familiar topics and introduce oneself/others.	Remember
C111.3	employ suitable strategies for skimming and scanning to get the general idea of a text and locate specific information	Apply
C111.4	recognize paragraph structure and be able to match beginnings/endings/headings with paragraphs	Undestand
C111.5	form sentences using proper grammatical structures and correct word forms	Analyze

Mathematics-I

CO#	Course outcome	BTL
C112.1	Use mean value theorems to real life problems	Apply
C112.2	Apply differential equations to solve electrical circuits, chemical reactions, Newton's Law of cooling, natural growth and decay	Apply
C112.3	Apply the second order differential equations for problems of electrical circuits.	Apply
C112.4	Determine the total derivative, functional dependence and maxima and minima of functions of several variables by using partial differential coefficients.	Understand
C112.5	Determine the area and volume of a given curve using double and triple integral	Understand

APPLIED CHEMISTRY

CO#	Course outcome	BTL
C113.1	Explain the preparation, properties and applications of some plastic materials	Understand
C113.2	Explain the theory and construction of battery and fuel cells.	Understand
C113.3	Understand the importance of materials like nonmaterial's and fullerenes (Understand)	Understand
C113.4	Understand importance molecular machines	Understand
C113.5	Explain the different applications of analytical instruments	Understand

Programming for Problem Solving Using C

CO#	Course outcome	BTL
C114.1	**Explain** the basic fundamental concepts, like computer system, computing environment and structure of c program	Understand
C114.2	**Use** the different operators and decision making statement based on problem.	Apply
C114.3	Develop the programs by using derived data types like arrays, strings, structures and unions	Apply
C114.4	Explain about pointers, dynamic memory allocation and pre processor commands.	Understand
C114.5	Classify the different categories of functions and file I/O.	Apply
C114.6	Develop the programs by using I/O files and use new tools	Apply

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A:Y-2021-22 SEM-I Branch:CIVIL

At the end of the course student will be able to:

Mathematics-I

CO#	Course outcomes	BTL
C112.1	Use mean value theorems to real life problems	APPLY
C112.2	Apply differential equations to solve electrical circuits, chemical reactions, Newton's Law of cooling, natural growth and decay	APPLY
C112.3	Apply the second order differential equations for problems of electrical circuits.	APPLY
C112.4	Determine the total derivative, functional dependence and maxima and minima of functions of several variables by using partial differential coefficients.	UNDERSTAND
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ENGINEERING PHYSICS

CO#	Course outcomes	BTL
C113.1	Analyze the difference between interference and diffraction. Analyze ordinary and Extraordinary polarized light.	Analyze
C113.2	Understand the basic concepts of LASER. Explain working principle of optical fibers.	Understand
C113.3	Explain concept of polarization in dielectric materials and Magnetization in Magnetic materials.	Understand
C113.4	Explain sound propagation in buildings. Explain production of Ultrasonics.	Understand
C113.5	Explain various crystal systems and crystal structure by powder method and laue's method.	Understand

Engineering Drawing

CO#	Course outcomes	BTL
C114.1	Use drawing instruments and to draw polygons, Engg. Curves and Scales	**Apply**
C114.2	Draw and understand orthographic projections, projections of points & lines	**Apply**
C114.3	Draw the projections of the plane inclined to both the planes.	**Apply**
C114.4	Draw the projections of the various types of solids in different positions inclined to one of the planes.	**Apply**
C114.5	Visualize and convert the isometric view to orthographic view and vice versa.	**Apply**

Engineering Geology

CO#	Course outcomes	BTL
C115.1	Explain the importance of engineering geology in civil engineering and their branches	Understand
C115.2	Illustrate the different rocks and minerals properties	Analyse
C115.3	Explain geological failures	Understand
C115.4	Categories of Earthquakes and landslides	Anlyse
C115.5	Describe the types of dams and Identify the suitability of location for structures	Anlyse

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A:Y-2020-2021 SEM-I Branch:MECH

Mathematics-I

CO#	Course Out come	BTL
C112.1	Use mean value theorems to real life problems	APPLY
C112.2	Apply differential equations to solve electrical circuits, chemical reactions, Newton's Law of cooling, natural growth and decay	APPLY
C112.3	Apply the second order differential equations for problems of electrical circuits.	APPLY
C112.4	Determine the total derivative, functional dependence and maxima and minima of functions of several variables by using partial differential coefficients.	UNDERSTAND
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ENGLISH

CO#	Course Out come	BTL
C111.1	understand social or transactional dialogues spoken by native speakers of English and identify the context, topic, and pieces of specific information.	Understand
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C111.3	employ suitable strategies for skimming and scanning to get the general idea of a text and locate specific information.	Apply
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ENGINEERING PHYSICS

CO#	Course Out come	BTL
C113.1	Analyze the difference between interference and diffraction. Analyze ordinary and Extraordinary polarized light.	Analyze
C113.2	Understand the basic concepts of LASER. Explain working principle of optical fibers.	Understand
C113.3	Explain concept of polarization in dielectric materials and Magnetization in Magnetic materials.	Understand
C113.4	Explain sound propagation in buildings. Explain production of Ultrasonics.	Understand
C113.5	Explain various crystal systems and crystal structure by powder method and laue's method.	Understand

Programming for Problem Solving Using C

CO#	Course Out come	BTL
C114.1	**Explain** the basic fundamental concepts, like computer system, computing environment and structure of c program	**Understand**
C114.2	**Use** the different operators and decision making statement based on problem.	**Apply**
C114.3	Develop the programs by using derived data types like arrays, strings, structures and unions	**Apply**
C114.4	Explain about pointers, dynamic memory allocation and pre processor commands.	**Understand**
C114.5	Classify the different categories of functions and file I/O.	**Apply**

Engineering Drawing

CO#	Course Out come	BTL
C115.1	Use drawing instruments and to draw polygons, Engg. Curves and Scales	**Apply**
C115.2	Draw and understand orthographic projections, projections of points & lines	**Apply**
C115.3	Draw the projections of the plane inclined to both the planes.	**Apply**
C115.4	Draw the projections of the various types of solids in different positions inclined to one of the planes.	**Apply**
C115.5	Visualize and convert the isometric view to orthographic view and vice versa.	**Apply**

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Department of Science and Humanities

A:Y-2020-2021 SEM-I Branch:ECE

Mathematics-I

CO#	Course Outcome	BTL
C112.1	Use mean value theorems to real life problems.	APPLY
C112.2	Apply differential equations to solve electrical circuits, chemical reactions, Newton's Law of cooling, natural growth and decay	APPLY
C112.3	Apply the second order differential equations for problems of electrical circuits.	APPLY
C112.4	Determine the total derivative, functional dependence and maxima and minima of functions of several variables by using partial differential coefficients.	UNDERSTAND
C112.5	Determine the area and volume of a given curve using double and triple integral	UNDERSTAND

ENGLISH

CO#	Course Outcome	BTL
C111.1	understand social or transactional dialogues spoken by native speakers of English and identify the context, topic, and pieces of specific information.	Understand
C111.2	ask and answer general questions on familiar topics and introduce oneself/others.	Remember
C111.3	employ suitable strategies for skimming and scanning to get the general idea of a text and locate specific information.	Apply
C111.4	recognize paragraph structure and be able to match beginnings/endings/headings with paragraphs.	Undestand
C111.5	form sentences using proper grammatical structures and correct word forms.	Analyze

APPLIED CHEMISTRY

CO#	Course Outcome	BTL
C113.1	Explain the preparation, properties and applications of some plastic materials	Understand
C113.2	Explain the theory and construction of battery and fuel cells.	Understand
C113.3	Understand the importance of materials like nonmaterial's and fullerenes (Understand)	Understand
C113.4	Understand importance molecular machines	Understand
C113.5	Explain the different applications of analytical instruments	Understand

Programming for Problem Solving Using C

CO#	Course Outcome	BTL
C114.1	**Explain** the basic fundamental concepts, like computer system, computing environment and structure of c program	**Understand**
C114.2	**Use** the different operators and decision making statement based on problem.	**Apply**
C114.3	Develop the programs by using derived data types like arrays, strings, structures and unions	**Apply**
C114.4	Explain about pointers, dynamic memory allocation and pre processor commands.	**Understand**
C114.5	Classify the different categories of functions and file I/O.	**Apply**
C114.6	Develop the programs by using I/O files and use new tools	**Apply**

Engineering Drawing

CO#	Course Outcome	BTL
C114.1	Use drawing instruments and to draw polygons, Engg. Curves and Scales	**Apply**
C114.2	Draw and understand orthographic projections, projections of points & lines	**Apply**
C114.3	Draw the projections of the plane inclined to both the planes.	**Apply**
C114.4	Draw the projections of the various types of solids in different positions inclined to one of the planes.	**Apply**
C114.5	Visualize and convert the isometric view to orthographic view and vice versa.	**Apply**

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A:Y-2020-2021 SEM-I Branch:CSE

Mathematics-I

C112.1	Use mean value theorems to real life problems	APPLY
C112.2	Apply differential equations to solve electrical circuits, chemical reactions, Newton's Law of cooling, natural growth and decay	APPLY
C112.3	Apply the second order differential equations for problems of electrical circuits.	APPLY
C112.4	Determine the total derivative, functional dependence and maxima and minima of functions of several variables by using partial differential coefficients.	UNDERSTAND
C112.5	Determine the area and volume of a given curve using double and triple integral	UNDERSTAND

ENGLISH

C111.1	understand social or transactional dialogues spoken by native speakers of English and identify the context, topic, and pieces of specific information)	Understand
C111.2	ask and answer general questions on familiar topics and introduce oneself/others. (Remember)	Remember
C111.3	employ suitable strategies for skimming and scanning to get the general idea of a text and locate specific information	Apply
C111.4	recognize paragraph structure and be able to match beginnings/endings/headings with paragraphs(Understand)	Undestand
C111.5	form sentences using proper grammatical structures and correct word forms	Analyze

APPLIED PHYSICS

C113.1	Analyze the difference between interference and diffraction.Analyze ordinary and Extraordinary polarized light.	Analyze
C113.2	Understand the basic concepts of LASER. Explain working principle of optical fibers.	Understand
C113.3	Explain the concept of dual nature of matter and concepts of classical and Quantum free electron theories.	Understand
C113.4	Explain concept of polarization in dielectric materials and Magnetization in Magnetic materials.	Understand
C113.5	Explain semiconductors and superconductivity property Materials.	Understand

Programming for Problem Solving Using C

C114.1	**Explain** the basic fundamental concepts, like computer system, computing environment and structure of c program	**Understand**
C114.2	**Use** the different operators and decision making statement based on problem.	**Apply**
C114.3	Develop the programs by using derived data types like arrays, strings, structures and unions	**Apply**
C114.4	Explain about pointers, dynamic memory allocation and pre processor commands.	**Understand**
C114.5	Classify the different categories of functions and file I/O.	**Apply**
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A:Y-2021-22 SEM-I Branch:AIML

Course outcome's summary

At the end of the course student will be able to:

ENGLISH

CO#	Course outcome	BTL
C111.1	understand social or transactional dialogues spoken by native speakers of English and identify the context, topic, and pieces of specific information)	Understand
C111.2	ask and answer general questions on familiar topics and introduce oneself/others.	Remember
C111.3	employ suitable strategies for skimming and scanning to get the general idea of a text and locate specific information	Apply
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C111.5	form sentences using proper grammatical structures and correct word forms	Analyze

Mathematics-I

CO#	Course outcome	BTL
C112.1	Use mean value theorems to real life problems	Apply
C112.2	Apply differential equations to solve electrical circuits, chemical reactions, Newton's Law of cooling, natural growth and decay	Apply
C112.3	Apply the second order differential equations for problems of electrical circuits.	Apply
C112.4	Determine the total derivative, functional dependence and maxima and minima of functions of several variables by using partial differential coefficients.	Understand
C112.5	Determine the area and volume of a given curve using double and triple integral	Understand

APPLIED CHEMISTRY

CO#	Course outcome	BTL
C113.1	Explain the preparation, properties and applications of some plastic materials	Understand
C113.2	Explain the theory and construction of battery and fuel cells.	Understand
C113.3	Understand the importance of materials like nonmaterial's and fullerenes (Understand)	Understand
C113.4	Understand importance molecular machines	Understand
C113.5	Explain the different applications of analytical instruments	Understand

Programming for Problem Solving Using C

CO#	Course outcome	BTL
C114.1	**Explain** the basic fundamental concepts, like computer system, computing environment and structure of c program	Understand
C114.2	**Use** the different operators and decision making statement based on problem.	Apply
C114.3	Develop the programs by using derived data types like arrays, strings, structures and unions	Apply
C114.4	Explain about pointers, dynamic memory allocation and pre processor commands.	Understand
C114.5	Classify the different categories of functions and file I/O.	Apply
C114.6	Develop the programs by using I/O files and use new tools	Apply

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II B.Tech- ISEM **DEPARTMENT OF CIVIL ENGINEERING** **A/Y-2021-2022**

C211- MATHEMATICS-III

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C211.1	Apply scalar ,vector fields ,scalar potential function and compute the gradient, divergence and curl.Use Vector integral theorems to facilitate vector integration	Evaluate
C211.2	Evaluatethe general solutions to linear ordinary differential equations by using Laplace transform.	Evaluate
C211.3	Find the Fourier series of continuous , finite discontinuities and periodic functions.Find the Fourier transforms of certain functions and integral transforms.	Apply
C211.4	To solve first order linear and non-linear partial differential equations in different standard forms.	Remember
C211.5	Find the complete solution of a non-homogeneous differential equation as a linear combination of the complementary function and a particular solution.	Apply

C212- STRENGTH OF MATERIALS –I

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C212.1	Explain the basic materials behavior under the influence of different external loading conditions and the support conditions.	Understand
C212.2	Develop the diagrams indicating the variation of the key performance features like bending moment and shear forces.	Create
C212.3	Calculate the section modulus and for determination of stresses developed in the beams.	Apply
C212.4	Calculate the shear stress distribution across various beam sections.	Apply
C212.5	Analyze the slope and deflection of different beams by using different methods.	Analyze

C213- FLUID MECHANICS

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C213.1	Explain the various properties of fluids and their influence on fluid motion.	Understand
C213.2	Calculate the forces that act on submerged planes and curves.	Apply
C213.3	Identify and analyze various types of fluid flows.	Analyze
C213.4	Apply the integral forms of the three fundamental laws of fluid mechanics	Apply
C213.5	Calculate the quantities of fluid flowing in pipes, tanks and channels.	Apply

C214- SURVEYING AND GEOMETRICS

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C214.1	Describe the basic surveying skills.	Understand
C214.2	Calculate linear and angular measurements by using Chain and Compass.	Apply
C214.3	Calculate levels of different points by using leveling instruments.	Apply
C214.4	Calculate linear and angular measurements by using Theodolite and Tachometry.	Apply
C214.5	Design and setting out various types of curves.	Create

C215- HIGHWAY ENGINEERING

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C215.1	Explain different types of components and functions of railway track with diagrams.	Understand
C215.2	Design geometrics in a railway track	Create
C215.3	Explain good transportation network	Understand
C215.4	Design of airport geometrics and airfield pavements.	Create
C215.5	Schedule for attending inspections and maintenance of docks and harbors.	Apply

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III B.Tech- I SEM **DEPARTMENT OF CIVIL ENGINEERING** **A/Y-2021-2022**

C311- STRUCTURAL ANALYSIS

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C311.1	Analysis the three hinged arches and two hinged arches	Analyze
C311.2	analyze the frames by the portal and cantilever method for lateral load	Analyze
C311.3	Analysis the cable and suspension bridge structure	Analyze
C311.4	Analysis the continuous beam with sinking and without sinking supports using moment distribution method	Analyze
C311.5	Analysis the continuous beam with sinking and without sinking & frame with sway and without sway using kani's method	Analyze

C312- CONCRETE TECHNOLOGY

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C312.1	Understand the basic concept of concrete and its ingredients & its importance	Understand
C312.2	Familiarize the basic ingredients of concrete and their role in the production of concrete & its behavior in the field	Remember
C312.3	Test the fresh concrete properties & hardened concrete properties	Evaluate
C312.4	Understand the various physical properties of concrete	Understand
C312.5	Design the concrete mix by BIS method	create

C313- WATER RESOURCES ENGINEERING - I

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C313.1	Calculate the rainfall data using different methods	Apply
C313.2	Explain about abstraction i.e., evaporation, transpiration, evapotranspiration, infiltration	Understand
C313.3	Analyze the runoff, catchment area characteristics, hydrograph by applying empirical formulae	Analyze
C313.4	Analyze the floods, causes and flood control method by applying the flood routing method	Analyze
C313.5	Derivation of confined and unconfined aquifers & Analyze the instantaneous unit hydrograph	Create

C314- ENVIRONMENTAL ENGINEERING - II

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C314.1	Plan and design the sewerage system	create
C314.2	Identify & Analyze the appropriate appurtenances in the sewerage system for building drainage and its design	Analyze
C314.3	Analyze & characterize the sewage	Analyze
C314.4	Design the suitable treatment flow for sewage treatment system	create
C314.5	Analyze the critical point of pollution in a river for a specific amount of pollutant disposal in to the river & Analyze characterize the bio solids & its disposal techniques	Analyze

C315- REPAIR & REHABILITATION OF BUILDINGS

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C315.1	Analyze of the service ability and residual life span of concrete structures by Visual inspection and in situ tests	Analyze
C315.2	Conduct field monitoring and non-destructive evaluation of concrete structures.	create
C315.3	Design and suggest repair strategies for deteriorated concrete structures including Repairing with composites.	create
C315.4	Understand the methods of strengthening methods for concrete structures	Understand
C315.5	Analyze of the service ability and residual life span of concrete structures by Visual inspection and in situ tests	Analyze

C316- ELEMENTS OF CIVIL ENGINEERING

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C316.1	Understand the basics of Civil Engineering concepts	Understand
C316.2	Analyze surveying the elevations and mapping	Analyze
C316.3	Understand construction materials and elements	Understand
C316.4	Understand water resource development	Understand
C316.5	Understand overall infrastructure development	Understand

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IVB.Tech-I SEM **DEPARTMENT OF CIVIL ENGINEERING** **A/Y-2021-2022**

C411- ENVIRONMENTAL ENGINEERING - II

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C411.1	Plan and design the sewerage system	create
C411.2	Identify & Analyze the appropriate appurtenances in the sewerage system for building drainage and its design	Analyze
C411.3	Analyze & characterize the sewage	Analyze
C411.4	Design the suitable treatment flow for sewage treatment system	create
C411.5	Analyze the critical point of pollution in a river for a specific amount of pollutant disposal in to the river	Analyze
C411.6	Analyze & characterize the bio solids & its disposal techniques	Analyze

C412- WATER RESOURCE ENGINEERING - II

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C412.1	Analyze the necessity and importance of irrigation and calculate the duty and delta for irrigation	Analyze
C412.2	Explain the classification of canals.	Understand
C412.3	Design the canal structure	Create
C412.4	Design of impervious floor for hydraulic structure	Create
C412.5	Describe the zone of storage, type of dam and selection of site for dam	Understand
C412.6	Design Ogee spillway and energy dissipation works	Create

C413- GEOTECHNICAL ENGINEERING - II

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C413.1	Analyze the stability infinite and finite soil slopes for different conditions	Analyze
C413.2	Calculate the magnitude of earth pressures acting on the earth retaining structures	Analyze
C413.3	Understand various types of foundations, foundation settlements and the bearing capacity of soils	Understand
C413.4	Calculate the load carrying capacity of piles and pile groups	Analyze
C413.5	Understand the forces acting on well foundations and their design criteria	Understand
C413.6	Understand the methods of soil exploration and preparation of soil investigation report	Understand

C414- REMOTE SENSING & GIS APPLICATIONS

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C414.1	Identify the Air & Ground based sensor platforms	Understand
C414.2	Analyze the Aerial Photographs & Satellite Imageries	Analyze
C414.3	Create Input spatial data for GIS applications	Understand
C414.4	Analyze & Design the Raster & Vector data	Understand
C414.5	Apply Remote Sensing concepts in Water Resources Engineering	Apply
C414.6	Apply GIS concepts in Transportation Engineering	Apply

C415- GROUND IMPROVEMENT TECHNIQUES

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C415.1	Describe the in-situ densification methods of ground improvement and their suitability to different field situations.	Understand
C415.2	Describe the dewatering methods of ground improvement and their suitability to different field situations.	Understand
C415.3	Apply different stabilization methods of ground improvement and their suitability to different field situations.	Apply
C415.4	Design a reinforced earth embankment and check its stability.	Create
C415.5	Apply different types of Geo-synthetics in different field conditions.	Apply
C415.6	Apply different grouting methods of ground improvement.	Apply

C416- GROUND WATER DEVELOPMENT

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C416.1	Describes the aquifer parameters and flow equation	Understand
C416.2	Design wells and understand the construction practices	create
C416.3	Design wells and understand the construction practices	create
C416.4	Determine the process of artificial recharge for increasing groundwater potential.	Analyze
C416.5	Interpret geophysical exploration recharge for increasing groundwater potential	create
C416.6	Apply appropriate measures for groundwater management	Understand

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II B.Tech- II SEM **DEPARTMENT OF CIVIL ENGINEERING** **A/Y-2021-2022**

C221- COMPLEX VARIABLE STATICAL METHODS

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C221.1	Apply Cauchy-Riemann equations to complex functions	Apply
C221.2	Evaluate the differentiation and integration of complex functions	Evaluate
C221.3	Evaluate certain integrals	Evaluate
C221.4	Apply discrete and continuous probability distributions	Apply
C221.5	Design the components of a classical hypothesis test	Create

C222- STRENGTH OF MATERIALS-II

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C222.1	Analyze the compound stresses and failure theories	Analyze
C222.2	Analyze the torsion stresses in shafts & springs	Analyze
C222.3	Analyze and evaluate the stresses in columns	Analyze
C222.4	Analyze deflections in beams due to different loading conditions three moment equation method	Analyze
C222.5	Compute stress in unsymmetrical bending and shear centre for a different sections	Apply

C223- HYDRAULICS AND HYDRAULIC MACHINERY

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C223.1	Solve uniform open channel flow problems.	Apply
C223.2	Solve non uniform open channel flow problems.	Apply
C223.3	Apply the principals of dimensional analysis and similitude in hydraulic model testing.	Apply
C223.4	Apply the principles of hydrodynamic forces of jets on different planes	Apply
C223.5	Apply the working principles of various hydraulic machineries & hydraulic design of turbines	Create

C224- ENVIRONMENTAL ENGINEERING

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C224.1	calculate the water demand and Specify design period of hydraulic structure	Apply
C224.2	Identify the water source and select proper intake structure	Analyze
C224.3	Characterization of water properties & its standards with reference to IS	Analyze
C224.4	Design the appropriate treatment methods for water to be treated	create
C224.5	Selection of suitable disinfection treatment method for miscellaneous treatment	Analyze

C225- MANAGERIAL ECONOMICS &FINANCIAL ANALYSIS

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C225.1	Explain the concept and importance of management and managerial problems	understand
C225.2	Describe an idea of production methods and technical relationship between input and output	understand
C225.3	Determine the types of market and pricing methods and strategies. Describe the types of industrial organization	understand
C225.4	Analyze the financial statements.	Analyze
C225.5	Evaluate the investment proposal in projects	Evaluate

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III B.Tech- IISEM **DEPARTMENT OF CIVIL ENGINEERING** **A/Y-2021-2022**

C321- DESIGN & DRAWING OF REINFORCED CONCRETE STRUCTURES

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C321.1	Analyze and design of beams by using WSM	Create
C321.2	Analyze and design of flexural members	Create
C321.3	Analyze and design of shear, bond, torsion for different structural elements	Create
C321.4	Analyze and design of slabs	Create
C321.5	Analyze and design of compression members & design of foundation	Create

C312- WATER RESOURCES ENGINEERING – II

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C322.1	Analyze the necessity and importance of irrigation and calculate the duty and delta for irrigation	Analyze
C322.2	Explain the classification of canals.	Understand
C322.3	Design the canal structure	Create
C322.4	Design of impervious floor for hydraulic structure	Create
C322.5	Describe the zone of storage, type of dam and selection of site for dam & Design Ogee spillway and energy dissipation works	Understand

C313- GEOTECHNICAL ENGINEERING - I

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C323.1	Describe various parameters related to soil mechanics and establish their inter-relationships.	Understand
C323.2	Describe methods of determination of various index properties of the soils and classify the soils.	Understand
C323.3	Know the importance of permeability, determine & apply it to different soils	Apply
C323.4	Identifying the importance of stress distribution, determine & apply it to different soils.	Analyze
C323.5	Know the importance of consolidation, determine & apply it to different soils & Evaluating the importance of shear strength of soils and determine & apply it to different soils.	Apply

C314- MANAGERIAL ECONOMICS &FINANCIAL ANALYSIS

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C324.1	Explain the concept and importance of management and managerial problems	understand
C324.2	Describe an idea of production methods and technical relationship between input and output	understand
C324.3	Determine the types of market and pricing methods and strategies. Describe the types of industrial organization	understand
C324.4	Analyze the financial statements.	Analyze
C324.5	Evaluate the investment proposal in projects	Evaluate

C315- PRESTRESSED CONCRETE

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C325.1	Describe the basic concepts & different methods of prestressing.	Understand
C325.2	Analyze a prestressed system to identify the resultant stresses.	Analyze
C325.3	Calculate the short and long term losses in the prestressed system.	Apply
C325.4	Design and analyze prestressed concrete beams under flexure and prediction of long and short term deflections by using IS 1343 codal provision.	Create
C325.5	Design and analyze prestressed concrete beams under shear and torsion by using IS 1343 codal provision.	Create

C316- PROJECT MANAGEMENT

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C326.1	Explain the importance of construction planning, networking and monitoring in construction projects.	Understand
C326.2	Analyze the cost of a construction project and Identify the optimum and crash cost of the project	Analyze
C326.3	Describe the functioning of various earth-moving equipment.	Understand
C326.4	Explain the methods of production of aggregate products, mixing and placing of concrete.	Understand
C326.5	Apply the gained knowledge to project management and construction techniques.	Apply

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IVB.Tech-I ISEM **DEPARTMENT OF CIVIL ENGINEERING** **A/Y-2021-2022**

C421- ESTIMATION SPECIFICATION & CONTRACTS

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C421.1	Determine the quantities for different components of buildings.	Apply
C421.2	Calculate the cost of various building components.	Apply
C421.3	Calculate the bar bending schedule for different structures	Apply
C421.4	Estimate the valuation of olden buildings	Evaluate
C421.5	Estimate the building quantities by individual wall method	Evaluate
C421.1	Determine the quantities for different components of buildings.	Apply

C422- CONSTRUCTION TECHNOLOGY & MANAGEMENT

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C422.1	Explain the importance of construction planning, networking and monitoring in construction projects.	Understand
C422.2	Analyze the cost of a construction project and Identify the optimum and crash cost of the project	Analyze
C422.3	Describe the functioning of various earth-moving equipment.	Understand
C422.4	Explain the methods of production of aggregate products, mixing and placing of concrete.	Understand
C422.5	Apply the gained knowledge to project management and construction techniques.	Apply
C422.6	Apply the concept of safety in construction projects.	Apply

C423- PRESTRESSED CONCRETE

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C423.1	Describe the basic concepts & different methods of prestressing.	Understand
C423.2	Analyze a prestressed system to identify the resultant stresses.	Analyze
C423.3	Calculate the short and long term losses in the prestressed system.	Apply
C423.4	Design and analyze prestressed concrete beams under flexure and prediction of long and short term deflections by using IS 1343 codal provision.	Create
C423.5	Design and analyze prestressed concrete beams under shear and torsion by using IS 1343 codal provision.	Create
C423.6	Design and analyze of end blocks for prestressed concrete beams.	Create

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C414- SOLID AND HAZARDOUS WASTE MANAGEMENT

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
C424.1	Character the solid waste and design a composting facility	Understand
C424.2	Know the Method of treatment and disposal of Hazardous wastes.	Analyze
C424.3	Design treatment of municipal solid waste and landfill	Analyze
C424.4	Know the Method of treatment and disposal of Hazardous wastes	create
C424.5	Design treatment of municipal solid waste and disposal	Analyze
C424.6	Design treatment of municipal solid waste	Analyze

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SRI VASAVI INSTITUTE OF ENGINEERING & TECHNOLOGY

Department of Electrical & Electronics Engineering

COUSE OUTCOMES SUMMARY A.Y:2021-22

III-I

CO#	CO STATEMENT	BTL
Power Systems-II(C311)		
C311.1	Calculate parameters of various types of transmission lines during different operating conditions.	Apply
C311.2	Analyze the performance of short and medium transmission lines.	Analyze
C311.3	Analyze the Performance of Long Transmission Lines	Analyze
C311.4	Evaluate reflection &Refraction Coefficients of travelling waves on transmission lines	Apply
C311.5	Analyze various factors related to charged transmission lines.	Analyze
C311.6	Determine sag/tension of transmission lines and performance of line Insulators. Calculate string efficiency	Apply
Renewable Energy Sources & Systems (C312)		
C312.1	Analyze solar radiation data, extraterritorial radiation, radiation on earth's surface	Analyze
C312.2	Design solar thermal collections	Design
C312.3	Design solar photo voltaic systems.	Design
C312.4	Develop maximum power point techniques in solar PV and wind	Design
C312.5	Determine Betz coefficient, tip speed ratio in wind energy conversion systems	Apply
C312.6	Evaluate the efficiency of hydro, tidal, biomass, fuel cell and geothermal systems	Apply
Signals and Systems(C313)		
C313.1	Define signals and systems, classify the signals, Systems and apply different operations on signal	Understand
C313.2	Determine Fourier series coefficient and Fourier transforms for different types of signals.	Apply
C313.3	Apply sampling theorem to convert continues time signals to discrete time signal and reconstruct back.	Apply
C313.4	Understand the Concepts of convolution, correlation, Energy and Power density spectrum and their relationships.	Understand
C313.5	Apply Laplace- Transform technique to analyze the continuous time systems represented by Linear Differential Equations & able to decide the stability of a system as well.	Apply
C313.6	Apply Z- Transform technique to analyze the 'Discrete Time' systems represented by 'Difference Equations'	Apply
Pulse & Digital Circuits(C314)		

C314.1	Design linear wave shaping circuits and derive the expressions for different input signals and apply as Integrator & Differentiator.	Create
C314.2	Design various clipping, clamping circuits and illustrate the clamping circuit theorem.	Create
C314.3	Illustrate how the transistor acts as a switch and understand the switching times of the transistor	Apply
C314.4	Design Multivibrators for various applications such as voltage to frequency converter, voltage to time converter etc	Create
C314.5	Illustrate the operation of Miller time base generator and bootstrap time base generator and UJT saw tooth generator.	Analyze
C314.6	Illustrate logic gates and sampling gates with the help of diodes and transistors	Apply
Power Electronics(C315)		
C315.1	Analyze the behavior of the various power semiconductor devices	Analyze
C315.2	Design AC-DC Single Phase Converters	Create
C315.3	Design AC-DC Three Phase Converters.	Create
C315.4	Design DC-DC Single Phase Converters	Create
C315.5	Design DC-AC Single & Three Phase Converters.	Create
C315.6	Design AC-AC Single & Three Phase Regulators.	Create

III-II

CO#	**CO Statement**	BTL
Course Name: Power Electronic Controllers & Drives (C321)		
C321.1	Explain the fundamentals of electric drive and different electric braking methods	Understand
C321.2	Analyze the operation of three phase converter fed dc motors and four quadrant operations of dc motors using dual converters	Analyze
C321.3	Describe the converter control of dc motors in various quadrants of operation	Understand
C321.4	Know the concept of speed control of induction motor by using AC voltage controllers and voltage source inverters	Understand
C321.5	Differentiate the stator side control and rotor side control of three phase induction motor.	Understand
C321.6	Explain the speed control mechanism of synchronous motors	Understand
Course Name:Power System Analysis (C322)		
C322.1	Design Impedance Diagram For A Power System	Create
C322.2	Analyse Aybusand Zbusfor A Power System Networks	Analyze
C322.3	Describe The Load Flow Solution Of A Power System	Understand
C322.4	Calculate Fault Currents For All Types Faults To Design Protective Devices	Apply

C322.5	Calculate Sequence Components Of Currents For Unbalanced Power System	Apply
C322.6	Analyze The All Stability Concepts Of A Power System	Analyze
Course Name: MICROPROCESSOR AND MICROCONTROLLER (C323)		
C323.1	Discuss 8086 microprocessor architecture and its functionalities	Understand
C323.2	Illustrate Minimum and maximum mode operations for 8086 Microprocessor.	Analyze
C323.3	Interface external peripherals and I/O devices and program the 8086 microprocessor.	Apply
C323.4	Discuss 8051 Microcontroller architectures and its functionalities	Understand
C323.5	Discuss and Illustrate PIC 18 microcontroller architecture and its functionalities	Analyze
C323.6	Design and develop PIC 18 Microcontroller for real time applications using "C" programming.	Apply
Course Name: Data Structures through C++(C324)		
C324.1	define the Concepts of OOPS, Data Structures and basic terminology used in Data Structures	**Remember**
C324.2	Discuss basic understanding and knowledge of Stacks, Queues using Abstract Data Type	**Understand**
C324.3	solve the problems using Linked List in C++	**Apply**
C324.4	compare the linear data structures with non linear data structures and explain the different types of Trees and its operations	**Analysis**
C324.5	compute the Shortest Path, Minimum Cost Spanning Trees for the given graph	**Evaluate**
C324.6	choose the best sorting techniques in terms of Time Complexity	**Create**
Course Name: NEURAL NETWORKS AND FUZZY LOGIC (C325)		
C325.1	Describe artificial neuron models	understand
C325.2	Execute learning methods of ANN	Apply
C325.3	Analyze different algorithms of ANN	Analyze
C325.4	Distinguish between classical and fuzzy sets	Analyze
C325.5	Analyze different modules of Fuzzy logic controller.	Analyze
C325.6	Execute Neural Networks and fuzzy logic for real-time applications	Apply

IV-I

CO#	**CO STATEMENT**	**BTL**
Utilization of Electrical Energy(C411)		
C411.1	Select a suitable motor for a given choice of load	Apply
C411.2	Choose suitable heating and welding method for given load	Evaluate

C411.3	Analyze the illumination levels of a light source.	Analyze
C411.4	Design different lighting schemes using various illumination methods.	Create
C411.5	Analyze speed-time curves of electric traction system	Analyze
C411.6	Calculate the parameters of electric traction system	Apply
Linear IC Applications(C412)		
C412.1	Identify different configurations of op-amp analyze the parameters of op-amp and observe the frequency response of operational amplifier	Analyze
C412.2	Understand non ideal characteristics of operational amplifier parameters	Understand
C412.3	Demonstrate linear and non applications of operational amplifiers	Apply
C412.4	Select active filter, multipliers and modulators according to the required application	Apply
C412.5	Implement various applications of special function Op-Amp ICs such as 555 IC and Analog multiplier, PLL.	Analyze
C412.6	Demonstrate and compare the performance of various types of ADC and DAC using Op-Amp	Apply
Power System Operation & Control(C413)		
C413.1	Determine optimal scheduling of Generators	Apply
C413.2	Analyze hydrothermal scheduling	Analyze
C413.3	Determine the unit commitment problem	Apply
C413.4	Determine the load frequency control for single area system	Apply
C413.5	Analyze PID controllers in single area and two area systems	Analyze
C413.6	Analyze reactive power control and line power compensaing system.	Analyze
Switchgear and Protection(C414)		
C414.1	Understand the principles of arc interruption for application to high voltage circuit breakers of air, oil, vacuum, SF6 gas type.	Apply
C414.2	Understand the working principle and constructional features of different types of electromagnetic protective relays.	Analyze
C414.3	Acquire in depth knowledge of faults that is observed to occur in high power generator	Apply
C414.4	Improves the ability to understand various types of protective schemes used for feeders and bus bar protection	Analyze
C414.5	Generates understanding of different types of static relays with a view to application in the system	Apply
C414.6	Understand the different types of over voltages appearing in the system	Apply
Instrumentation(C415)		

C415.1	Represent various types of signals	Understand
C415.2	Use various types of transducers	Apply
C415.3	Measure various parameters such as strain, velocity, temperature, pressure	Apply
C415.4	Use various types of digital voltmeters.	Apply
C415.5	Measure various parameter like phase and frequency of a signal with the help of CRO.	Apply
C415.6	Measure various parameter like phase and frequency of a signal with the help of CRO.	Apply
Electric Power Quality(C416)		
C416.1	Differentiate between different types of power quality problems	Understand
C416.2	Illustrate the sources of disturbances in a power system	Apply
C416.3	Analyze power quality terms and power quality standards	Analyze
C416.4	Illustrate the principle of voltage regulation and power factor improvement methods	Apply
C416.5	Demonstrate the relationship between distributed generation and power quality	Apply
C416.6	Illustrate the power quality monitoring concepts and the usage of measuring instruments	Apply

IV-II

CO#	CO Statement	BTL
Course Name: Digital Control Systems (C421)		
C421.1	Illustrate the concepts of digital control systems and assemble various components associated with it.	Understand
C421.2	Apply the theory of z–transformations for the mathematical analysis of digital control systems	Remember
C421.3	Represent the discrete–time systems in state–space model and evaluation of state transition matrix	Analyze
C421.4	Examine the stability of the system using different tests	Analyze
C421.5	Study the conventional method of analyzing digital control systems in the w–plane	Analyze
C421.6	Study the design of state feedback control by “the pole placement method.	Analyze
Course Name: High Voltage Engineering (C422)		
C422.1	Acquaint with the performance of high voltages with regard to different configurations of electrode systems	Remember
C422.2	Develop ability to understand theory of breakdown and withstand Phenomena of all types of dielectric materials	Remember
C422.3	Acquaint with the techniques of generation of AC, DC and Impulse	Analyze

	voltages	
C422.4	Emphasize the knowledge for measurement of high voltage and high current AC, DC and Impulse	Analyze
C422.5	Measure dielectric property of material used for HV equipment	Analyze
C422.6	Test various equipment's used in HV engineering	Analyze
Course Name: ELECTRIC POWER QUALITY (C423)		
C423.1	Differentiate between different types of power quality problems	Understand
C423.2	Illustrate The Sources Of Disturbances In A Power System	Apply
C423.3	Analyze Power Quality Terms And Power Quality Standards	Analyze
C423.4	Illustrate The Principle Of Voltage Regulation And Power Factor Improvement Methods	Apply
C423.5	Demonstrate The Relationship Between Distributed Generation And Power Quality	Apply
C423.6	Illustrate The Power Quality Monitoring Concepts And The Usage Of Measuring Instruments	Apply
Course Name: FACTS (C424)		
C424.1	Understand power flow control in transmission lines using FACTS controllers	Understand
C424.2	Explain operation and control of voltage source converter	Understand
C424.3	Analyze compensation methods to improve stability and reduce power oscillations in the transmission lines	Analyze
C424.4	Explain the method of shunt compensation using static VAR compensators	Understand
C424.5	Understand the methods of compensations using series compensators	Understand
C424.6	Explain operation of Unified Power Flow Controller (UPFC)	Understand

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SRI VASAVI INSTITUTE OF ENGINEERING & TECHNOLOGY
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COURSE OUTCOMES

Academic year-2021-2022 **Year/sem- II-I**

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
VECTOR CALCULUS & FOURIER TRANSFORMS(C211)		
C211.1	interpret the physical meaning of different operators such as gradient, curl and divergence	Evaluate
C211.2	estimate the work done against a field, circulation and flux using vector calculus	Evaluate
C211.3	apply the Laplace transform for solving differential equations	Apply
C211.4	find or compute the Fourier series of periodic signals know and be able to apply integral expressions for the forwards and inverse Fourier transform to a range of non-periodic waveforms	Remember
C211.5	identify solution methods for partial differential equations that model physical processes	Apply
MECHANICS OF SOLIDS (C212)		
C212.1	Discuss the stress, strain, poisons ratio and thermal stress in members including strain energy under different loadings.	Understand
C212.2	Investigate the construction of shear force diagrams and bending moment diagrams.	Create
C212.3	Examine the bending and shear stress induced in the beams.	Analyze
C212.4	Appraise slope and deflection for different support arrangements.	Evaluate
C212.5	Execute how a cylinder fails what kind of stresses induced in cylinders subjected to internal, external pressures.	Apply
FLUID MECHANICS & HYDRAULIC MACHINERY(C213)		
C213.1	Explain properties of fluids and measure pressure of the flowing fluid	Evaluate
C213.2	Use Euler's equation, Bernoulli's equation, Energy momentum equations and solve various fluid flow problems	Apply
C213.3	Perform dimensional analysis and explain boundary layer theory	Analyze
C213.4	Calculate hydrodynamic forces and efficiencies. Appraise the performance of turbines under varying load conditions	Evaluate
C213.5	Appraise the performance of pumps under varying load conditions. Explain hydraulic systems like lifts which are suitable for industrial requirements	Evaluate
PRODUCTION TECHNOLOGY(C214)		
C214.1	understand the principles of casting and Pattern making	Understand
C214.2	design the gating system and understand special casting processes	Apply

C214.3	list out various welding defects and propose remedial measures and choose appropriate type of welding process for joining of metals.	Understand
C214.4	distinguish between hot working and cold working processes and understand the principles of various forging, rolling,extrusion, drawing operations	Analyze
C214.5	understand the principles of various Sheet metal forming, High energy rate forming processes.	Understand
KINEMATICS OF MACHINERY (C215)		
C215.1	Contrive a mechanism for a given plane motion with single degree of freedom.	**Apply**
C215.2	Suggest and analyze a mechanism for a given straight line motion and automobile steering motion	**Analyze**
C215.3	Analyze the motion (velocity and acceleration) of a plane mechanism.	**Analyze**
C215.4	Suggest and analyze mechanisms for a prescribed intermittent motion like opening and closing of IC engine valves etc.	**Analyze**
C215.5	Select a power transmission system for a given application and analyze motion of different transmission systems	**Apply**
COMPUTER AIDED ENGINEERING DRAWING PRACTICE(C216)		
C216.1	Draw the projections of solids inclined both planes	Apply
C216.2	Draw the sections of solids and development of surfaces	Apply
C216.3	Draw the intersections of solids and Perspective projections	Apply
C216.4	Understand the commands used in CAD	Understand
C216.5	Model the 2D and 3D objects using CAD	Apply
FLUID MECHANICS & HYDRAULIC MACHINES LAB (C217)		
C217.1	Explain properties of fluids and measure pressure of the flowing fluid	Evaluate
C217.2	Use Euler's equation, Bernoulli's equation, Energy momentum equations and solve various fluid flow problems	Apply
C217.3	Perform dimensional analysis and explain boundary layer theory	Analyze
C217.4	Calculate hydrodynamic forces and efficiencies. Appraise the performance of turbines under varying load conditions	Evaluate
C217.5	Appraise the performance of pumps under varying load conditions. Explain hydraulic systems like lifts which are suitable for industrial requirements	Evaluate
PRODUCTION TECHNOLOGY LAB (C218)		
C218.1	Understand the principles of casting and Pattern making	Understand
C218.2	Design the gating system and understand special casting processes	Apply
C218.3	List out various welding defects and propose remedial measures and choose appropriate type of welding process for joining of metals.	Understand

C218.4	Distinguish between hot working and cold working processes and understand the principles of various forging,rolling,extrusion,drawing operations	Analyze
C218.5	Understand the principles of various Sheet metal forming, High energy rate forming processes	Understand
DRAFTING AND MODELING LAB (C219)		
C219.1	Understand skills in engineering drawing and to introduce drawing packages and commands for computer aided drawing and modeling .	Understand
C219.2	Utilize various commands in AUTOCAD to draw geometric entities and to create 2D wireframe models	Apply
C219.3	Interpret various commands in AutoCAD to draw geometric entities and to create 3D wire frame models	Apply
C219.4	Construct geometrical model of simple solids, machines and machine parts.	Analyze
C219.5	Understand view points and view ports, view point coordinates and views displayed and develop computer aided solid models with isometric and orthographic projection.	Understand

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COURSE OUTCOMES

Academic year-2021-2022 **Year/sem- II-II**

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
MATERIAL SCIENCE & METALLURGY (C221)		
C221.1	Interpret the Structure of Metals and phase diagrams of materials	Apply
C221.2	Distinguish different types of Ferrous metals, Non-ferrous Metals and Alloys	Analyze
C221.3	Interpret different heat treatment processes to get desired mechanical properties of metals	Analyze
C221.4	Describe the powder metallurgy	Understand
C221.5	Compare the unique nature of ceramics and composite materials.	Analyze
COMPLEX VARIABLES & STATISTICAL METHODS (C222)		
C222.1	Demonstrate the ability to write and evaluate a proof of Cauchy-Riemann equations and give examples of each proof technique described.	Remember
C222.2	Understand the basic principles of Line integrals. And solving the Residue theorem	Understand
C222.3	Apply discrete and continuous probability distributions	Apply
C222.4	Infer the statistical inferential methods based on small and large sampling tests	Apply
C222.5	Design the components of a classical hypothesis test	Understand
DYNAMICS OF MACHINERY (C223)		
C223.1	Compute frictional losses, torque transmission of mechanical systems.	Evaluate
C223.2	Analyze dynamic force analysis of slider crank mechanism and design of flywheel.	Apply
C223.3	Analyze stabilization of sea vehicles, aircrafts and automobile vehicles and Understand the working of various types of governors	Apply
C223.4	Understand balancing of reciprocating and rotary masses.	Understand
C223.5	Understand how to determine the natural frequencies of continuous systems starting from the general equation of displacement.	Understand
THERMAL ENGINEERING-I (C224)		
C224.1	Compare the Air standard Cycles with Actual Cycles	Analyze
C224.2	Classify the essential components of IC engine	Understand
C224.3	Describe the combustion phenomenon in SI and CI engines	Understand
C224.4	Evaluate the performance of an IC Engine	Evaluate
C224.5	Interpret the basic principles of Gas turbines, Jet propulsion and rocket engineering	Apply
INDUSTRIAL ENGINEERING & MANAGEMENT (C225)		
C225.1	Describe the role of industrial engineer and list the function of management	Understand
C225.2	Illustrate the Design of Plant Layout and study of quantitative techniques for optimal design of Plant Layout	Apply
C225.3	Distinguish between time study and Method study	Analyze
C225.4	Interpret control charts for assessment of process quality	Understand
C225.5	List out the functions of Human Resource Management, Personnel and industrial management	Remember

MECHANICS OF SOLIDS AND METALLURGY LAB (C226)		
C226.1	Apply methods to determine Mechanical properties and Elastic Constants	Apply
C226.2	Familiarise the students with the use of testing machines	Understand
C226.3	Study the stress, strain under different loadings.	Understand
C226.4	Characterize the microstructures of different ferrous and non ferrous metals.	Understand
C226.5	Identify the effect of heat treatment and cooling rates on the properties of steels	Understand
MACHINE DRAWING PRACTICE (C227)		
C227.1	Explain and apply the procedure to draw screw threads,bolts,stud bolts,tap bolts,set screws	Apply
C227.2	Explain and apply the procedure to draw keys,cotter joints and knuckle joint	Apply
C227.3	Explain and apply the procedure to draw riveted joints for plates	Apply
C227.4	Explain and apply the procedure to draw shaft coupling,spigot and socket joint	Apply
C227.5	Explain and apply the procedure to draw journal,pivot,foot step bearings and assembly drawings of plummer block,tailstock,welded joints,tool head of shaper	Apply
THEORY OF MACHINES LAB(C228)		
C228.1	Compute frictional losses, torque transmission of mechanical systems.	Apply
C228.2	Analyze dynamic force analysis of slider crank mechanism and design of flywheel.	Analyze
C228.3	Analyze stabilization of sea vehicles, aircrafts and automobile vehicles and Understand the working of various types of governors	Analyze
C228.4	Understand balancing of reciprocating and rotary masses.	Understand
C228.5	Understand how to determine the natural frequencies of continuous systems starting from the general equation of displacement.	Understand

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COURSE OUTCOMES

Academic year-2021-2022 **Year/sem- III-I**

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
DYNAMICS OF MACHINERY(C311)		
C311.1	Compute frictional losses, torque transmission of mechanical systems.	Evaluate
C311.2	Analyze dynamic force analysis of slider crank mechanism and design of flywheel.	Apply
C311.3	Analyze stabilization of sea vehicles, aircrafts and automobile vehicles and Understand the working of various types of governors	Apply
C311.4	Understand balancing of reciprocating and rotary masses.	Understand
C311.5	Understand how to determine the natural frequencies of continuous systems starting from the general equation of displacement.	Understand
DESIGN OF MACHINE MEMBERS-II(C312)		
C312.1	Select Suitable bearing based on the application of loads and predict the life of bearing.	Understand
C312.2	Interpret the new I.C engine parts such as connecting rod, crank, piston, cylinder with the help of design considerations	Apply
C312.3	Differentiate power transmission elements such as Chains, Belts, Ropes, Pulleys, Power screws	Analyze
C312.4	Distinguish the analysis of Spur and Helical gears. different types of Levers.	Analyze
C312.5	Solve the expression of radius of neutral axis for different cross section of Curved beams and determine the cross section of levers	Apply
MECHANICAL MESUREMENTS & METROLOGY (C313)		
C313.1	Inspection of engineering parts with various precision instruments	Analyze
C313.2	The methods of measurement of displacement, speed, acceleration, vibration, stress and strain, force, torque and power.	Understand
C313.3	Design of part, tolerances and fits Principles of measuring instruments and gauges and their uses	Understand
C313.4	Evaluation and inspection of surface roughness, measurement of angles and tapers	Apply
C313.5	Inspection of spur gear and thread elements and screw thread measurement	Apply
MANEGERIAL ECONOMICS & FINANCIAL ACCOUNTANCY (C314)		
C314.1	Explain The Concept And Importance Of Management And Managerial Problems	Understand
C314.2	Describe An Idea Of Production Methods And Technical Relationship Between Input And Output	Understand
C314.3	Determine The Types Of Market And Pricing Methods And Strategies. Describe The Types Of Industrial Organization	Understand

C314.4	Analyze The Financial Statements.	Analyze
C314.5	Evaluate The Investment Proposal In Projects.	Evaluate
IC ENGINES & GAS TURBINES(C315)		
C315.1	Compare the Air standard Cycles with Actual Cycles	Analyze
C315.2	Classify the essential components of IC engine	Understand
C315.3	Describe the combustion phenomenon in SI and CI engines	Understand
C315.4	Evaluate the performance of an IC Engine	Evaluate
C315.5	Interpret the basic principles of Gas turbines, Jet propulsion and rocket engineering.	Apply
THERMAL ENGINEERING LAB (C316)		
C316.1	Inspection of engineering parts with various precision instruments	Analyze
C316.2	The methods of measurement of displacement, speed, acceleration, vibration, stress and strain, force, torque and power.	Understand
C316.3	Design of part, tolerances and fits Principles of measuring instruments and gauges and their uses	Understand
C316.4	Evaluation and inspection of surface roughness, measurement of angles and tapers	Apply
C316.5	Inspection of spur gear and thread elements and screw thread measurement	Apply
THEORY OF MACHINES LAB (C317)		
C317.1	Compute frictional losses, torque transmission of mechanical systems.	Apply
C317.2	Analyze dynamic force analysis of slider crank mechanism and design of flywheel.	Analyze
C317.3	Analyze stabilization of sea vehicles, aircrafts and automobile vehicles and Understand the working of various types of governors	Analyze
C317.4	Understand balancing of reciprocating and rotary masses.	Understand
C317.5	Understand how to determine the natural frequencies of continuous systems starting from the general equation of displacement.	Understand
MECHANICAL MEASUREMENT &METROLOGY LAB (C318)		
C318.1	Inspection of engineering parts with various precision instruments	Analyze
C318.2	The methods of measurement of displacement, speed, acceleration, vibration, stress and strain, force, torque and power.	Understand
C318.3	Design of part, tolerances and fits Principles of measuring instruments and gauges and their uses	Understand
C318.4	Evaluation and inspection of surface roughness, measurement of angles and tapers	Apply
C318.5	Inspection of spur gear and thread elements and screw thread measurement	Apply
SOCIALLY RELEVANT PROJECT(C319)		

C319.1	Describe the abstract of the project	Understand
C319.2	Collect the information about the project	Analyze
C319.3	Implement and test the project which is useful to the society	Evaluate
C319.4	Describe the summary of the project and identify the impact of the project in the society	Evaluate
C319.5	Demonstrate the project individual and in a group	Apply

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COURSE OUTCOMES

Academic year-2021-2022 **Year/sem- III-II**

SNO	QUESTIONNAIRE	YourRating
OPERATIONS RESEARCH (C321)		
C321.1	Construct the mathematical models of conflicting situations and mathematical analysis methods in operations research.	Analyze
C321.2	Build and solve Transportation Models and Assignment Models.	Apply
C321.3	Assess the life of systems using replacement theory.	Analyze
C321.4	calculate the waiting time of the queue and system and solve the game problems.	Analyze
C321.5	Model the project management problems through CPM and PERT.	Apply
HEAT TRANSFER (C322)		
C322.1	Understand the basic laws of heat transfer and temperature distribution in solids	Understand
C322.2	Analyze the fins and unsteady heat conduction	Analyze
C322.3	Apply the Dimensional analysis on convective heat transfer problems	Apply
C322.4	Analyze free convection, heat exchangers by LMTD and NTU methods	Analyze
C322.5	Understanding of the phenomenon of thermal radiation, boiling and condensation	Understand
CAD/CAM(C323)		
C323.1	Understand the basic fundamentals of computer aided design and manufacturing.	Apply
C323.2	To learn 2D & 3D transformations of the basic entities like line, circle, ellipse etc	Understand
C323.3	To understand the different geometric modeling techniques like solid modeling, surface modeling, feature based modeling etc. and to visualize how the components look like before its manufacturing or fabrication	Understand
C323.4	To learn the part programming, importance of group technology, computer aided process planning, computer aided quality control	Analyze
C323.5	To learn the overall configuration and elements of computer integrated manufacturing systems	Understand
REFRIGERATION & AIR CONDITIONING (C324)		
C324.1	Demonstrate the fundamental principle of RAC	Apply
C324.2	Examine the performance of VCR system	Analyze
C324.3	Discuss the properties, applications and environmental issues of different refrigerants and VCR components	Understand
C324.4	Differentiate the working principles of Vapor Absorption refrigeration system and Steam jet refrigeration systems	Analyze
C324.5	Appraise the cooling and heating loads in an Air Conditioning systems and Identify Air Conditioning system components	Evaluate
AUTOMOBILE ENGINEERING (C325)		
C325.1	Distinguish the various components of four wheeler Automobile	Analyze

C325.2	Describe various fuel supply systems in SI and CI engines	Understand
C325.3	Interpret the cooling system and ignition systems	Understand
C325.4	Describe the electrical & the principles of transmission,	Understand
C325.5	Explain the principles of steering ,suspension and braking systems	Understand
SIMULATION OF MECHANICAL SYSTEMS LAB (C326)		
C326.1	Compute frictional losses ,torque transmission of mechanical systems	Understand
C326.2	Analyze dynamic force analysis of slider crank mechanism and design of flywheel.	Analyze
C326.3	Understand how to determine the natural frequencies of continuous systems starting from the general equation of displacement.	Analyze
C326.4	Contrive a mechanism for a given plane motion with single degree of freedom	Apply
C326.5	Suggest and analyze a mechanism for a given straight line motion and automobile steering motion.	Analyze
HEAT TRANSFER LAB (C327)		
C327.1	Understand the basic laws of heat transfer and temperature distribution in solids	Understand
C327.2	Analyze the fins and unsteady heat conduction	Analyze
C327.3	Understand and apply Dimensional analysis on heat transfer	Apply
C327.4	Solve the problems related to free and forced convection	Analyze
C327.5	Analyze heat exchangers by LMTD and NTU methods along with Understanding of the phenomenon of boiling and condensation	Analyze
CAD /CAM LAB (C328)		
C328.1	Implement the basic fundamentals of CAD & CAM.	Apply
C328.2	Describe the mathematical basis in the technique of representation of parametric curves, wireframe, surfaces & solid modeling and can visualize the components	Understand
C328.3	Explain the difference between NC's and CNC's and he can also know the methods involved in part programming.	Understand
C328.4	Examine the use of GT and CAPP for the production development	Analyze
C328.5	Implement the various elements and their activities in the CIM systems	Apply

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COURSE OUTCOMES

Academic year-2021-2022 **Year/sem- IV-I**

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
	MECHATRONICS (C411)	
C411.1	Interpret the knowledge of mechatronics systems	Apply
C411.2	Recognize the Solid state electronic devices	understand
C411.3	Recognize the Hydraulic and pneumatic actuating systems	understand
C411.4	Interpret the knowledge of Digital electronics and systems	Apply
C411.5	Distinguish the System and interfacing and data acquisition	Analyze
C411.6	Examine the Dynamic models and analogies	Analyze
	CAD/CAM(C412)	
C412.1	Implement the basic fundamentals of CAD & CAM.	Apply
C412.2	Describe the mathematical basis in the technique of representation of parametric curves, wireframe, surfaces & solid modeling and can visualize the components	Understand
C412.3	Explain the difference between NC's and CNC's and he can also know the methods involved in part programming.	Understand
C412.4	Examine the use of GT and CAPP for the production development	Analyze
C412.5	Identify the importance of CAQC at different contact and non contact inspection methods to improve the quality control	Understand
C412.6	Implement the various elements and their activities in the CIM systems	Apply
	FINITE ELEMENT METHODS(C413)	
C413.1	Derive and apply the relationships for the given applications	Apply
C413.2	Understand and apply the concepts behind Variational methods and weighted residual methods in FEM	Apply
C413.3	Identify the application and characteristics of FEA elements such as bars, beams, plane and isoparametric elements, and 3-D elements for engineering problems	Evaluate
C413.4	solve any integration problems using numerical method using Gausian Quadrature	Apply
C413.5	Able to develop finite element modeling for complex elements such as higher order	Creating
C413.6	Solve the engineering problems in dynamics and heat transfer using FEM	Apply
	POWER PLANT ENGINEERING (C414)	
C414.1	Explain power generation in steam power plants	Understand
C414.2	Explain plant layout and various systems in Diesel power plant and Gas turbine plant	Understand

C414.3	Explain various aspects like power generation, classification of dams, plant layout and plant auxiliaries	Understand
C414.4	Explain various types of reactors in Nuclear power plants	Understand
C414.5	Explain combined operations of different power plants and power plant instrumentation and control systems	Understand
C414.6	Explain demands, loads and calculate various costs for solving the given problem.	Apply
	ADDITIVE MANUFACTURING (C415)	
C415.1	Interpret the knowledge of Rapid prototyping systems	Apply
C415.2	Explain the Solid based rapid prototyping systems	Understand
C415.3	Differentiate the powder based rapid prototyping systems from other rapid prototyping systems.	Analyze
C415.4	Interpret the knowledge of Rapid tooling	Apply
C415.5	Distinguish the rapid prototyping data formats and software's.	Analyze
C415.6	Select the appropriate rapid prototyping system for suitable application.	Evaluate
	ADVANCED MATERIALS (C416)	
C416.1	Describe the basic concepts of composite materials	**Understand**
C416.2	Illustrate the polymer composites	**Understand**
C416.3	Demonstrate the different manufacturing methods	**Apply**
C416.4	Analyze the macro mechanical analysis of lamina	**Analyze**
C416.5	Classify FGM and Shape memory alloys	**Understand**
C416.6	Distinguish the Nano materials	**Analyze**
	CAD/CAM LAB (C417)	
C417.1	Implement the basic fundamentals of CAD & CAM.	**Apply**
C417.2	Describe the mathematical basis in the technique of representation of parametric curves, wireframe, surfaces & solid modeling and can visualize the components	**Understand**
C417.3	Explain the difference between NC's and CNC's and he can also know the methods involved in part programming.	**Understand**
C417.4	Examine the use of GT and CAPP for the production development	**Analyze**
C417.5	Identify the importance of CAQC at different contact and non contact inspection methods to improve the quality control	**Understand**
C417.6	Implement the various elements and their activities in the CIM systems	**Apply**

MECHATRONICS LAB (C418)		
C418.1	Interpret the knowledge of mechatronics systems	Apply
C418.2	Recognize the Solid state electronic devices	understand
C418.3	Recognize the Hydraulic and pneumatic actuating systems	understand
C418.4	Interpret the knowledge of Digital electronics and systems	Apply
C418.5	Distinguish the System and interfacing and data acquisition	Analyze
C418.6	Examine the Dynamic models and analogies	Analyze

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COURSE OUTCOMES

Academic year-2021-2022 **Year/sem- IV-II**

CO Number	Course Outcome(CO) Statement- At the end of the Course, the students will be able to	Blooms Taxonomy
PRODUCTION PLANNING AND CONTROL (C421)		
C421.1	Explain the concepts of production and service systems	Understand
C421.2	Implement the principles and techniques in the design, planning and control of Forecasting systems	Apply
C421.3	Execute different strategies employed in manufacturing and service industries to plan production and control inventory.	Apply
C421.4	Distinguish the effectiveness, identify likely areas for improvement of Routing	Analyze
C421.5	Distinguish the implement and improved of Scheduling policies	Analyze
C421.6	Implement the mechanical details and to calculate power and efficiency of rotary compressors.	Apply
UNCONVENTIONAL MACHINING PROCESSES(C422)		
C422.1	Sketch and select the process parameters of USM which will effect the MRR	Evaluate
C422.2	Solve problems for estimation of MRR in ECM	Apply
C422.3	Explain different thermal metal removal process	Understand
C422.4	Compare EBM & LBM along with process parameters	Analyze
C422.5	Differentiate PAM from other unconventional machining process	Analyze
C422.6	Select the appropriate unconventional machining process based on the application and process parameters	Evaluate
AUTOMOBILE ENGINEERING(C423)		
C423.1	Distinguish basic components of automobile	Analyze
C423.2	Describe about the clutches, gear boxes, flywheel, rear axle types, wheels and tyres	Understand
C423.3	Demonstrate the functioning of steering system	Apply
C423.4	Demonstrate the functioning of suspension, braking and electrical systems	Apply
C423.5	Describe the safe attitude towards mechanical operations of the automotive industry	Understand
C423.6	Examine and control pollutants from the engine	Analyze
NON DESTRUCTIVE EVALUATION (C424)		
C424.1	Differentiate the Non destructive and Destructive Techniques	Analyze
C424.2	Explain the principle and limitations of Ultra sonic test	Understand
C424.3	Implement the Liquid penetration test	Apply
C424.4	Compare the magnetic particle test with other ND Techniques	Apply
C424.5	Describe the effectiveness of Eddy current test	Understand
C424.6	Select the appropriate ND Technique for several industrial applications	Evaluate
SEMINAR(C425)		
C425.1	Describe the abstract of the seminar	Understand
C425.2	Collect the information about the seminar	Analyze
C425.3	Identify the time duration required to develop the report	Understand
C425.4	Implement the seminar which is useful to the society	Evaluate
C425.5	Describe the summary of the project and identify the impact of the project in the society	Evaluate

C425.6	Demonstrate the seminar individually.	Apply
PROJECT(C426)		
C426.1	Describe the abstract of the project	Understand
C426.2	Collect the information about the project	Analyze
C426.3	Identify the time duration and cost required to develop the project	Understand
C426.4	Implement and test the project which is useful to the society	Evaluate
C426.5	Describe the summary of the project and identify the impact of the project in the society	Evaluate
C426.6	Demonstrate the project individual and in a group	Apply

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SRI VASAVI INSTITUTE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

ACADAMIC YEAR-2021-22

COURSE OUTCOMES SUMMARY

II/I(R20)

Course Code	Course Name: EDC(211)	Blooms Taxonomy Level
C211.1	Describe the fundamentals of semiconductor materials, PN Junction diode and their characteristics.	Understand
C211.2	Explain the operation of various special diodes and distinguish between their characteristics and also the operation of different types of rectifiers with and without filters.	Understand
C211.3	Describe the operation of different types of transistors in different configurations, FET'S and observe their characteristics.	Understand
C211.4	Analyze different types of transistors biasing and thermal stabilization techniques.	Analyze
C211.5	Analyze the small signal low frequency different types of transistors BJT and FET amplifier models.	Analyze
	STLD(212)	
C212.1	Explain the structure of number systems and its applications.	**Understand**
C212.2	Design circuits to solve problems using gates to replicate all logic functions.	**Create**
C212.3	Analyze combinational logic circuits and Design combinational logic circuits using programmable logic devices.	**Create**
C212.4	Analyze sequential logic circuits.	**Analyze**
C212.5	Design sequential circuits in terms of FSM.	**Create**
	S&S (C213)	
C213.1	Differentiate the various classifications of signals and systems	Understand
C213.2	Analyze the frequency domain representation of signals using Fourier concepts	Apply
C213.3	Classify the systems based on their properties and determine the response ofLTI Systems	Understand
C213.4	Know the sampling process and various types of sampling techniques	Understand
C213.5	Apply Laplace and z-transforms to analyze signals and	Apply

	Systems (continuous &discrete)	
MATHMATICS III (C214)		
C214.1	Apply scalar ,vector fields ,scalar potential function and compute the gradient, divergence and curl.Use Vector integral theorems to facilitate vector integration	Apply
C214.2	Evaluatethe general solutions to linear ordinary differential equations by using Laplace transform.	Evaluate
C214.3	Find the Fourier series of continuous , finite discontinuities and periodic functions.Find the Fourier transforms of certain functions and integral transforms.	Understand
C214.4	To solve first order linear and non-linear partial differential equations in different standard forms.	Apply
C214 .5	Find the complete solution of a non-homogeneous differential equation as a linear combination of the complementary function and a particular solution.	Understand
	RVSP (C215)	
C215.1	Understand the basics of probability, events, sample space and how to use them to real life problems.	Understand & Apply
C215.2	Analyze that the random variable is always a numerical quantity.	Understand & Apply
C215.3	Understand the multiple random variables and relate through examples to real problems.	Understand & Apply
C215.4	Understand the concept of random processes in both deterministic and non deterministic types, & correlation functions.	Understand & Apply
C215.5	Evaluate the Autocorrelation and its relation with power density spectrum and its properties. Evaluate the linear systems with random inputs	Understand & Apply
OOPs through Java (C216)		
C216.1	Develop a familarity with oops concepts	Understand
C216.2	Describe important characteristics of oops and the features of such systems	Remember
C216.3	Describe the features and applications of important standard protocols	Analyze
C216.4	Gaining practical experience of inter -process communication in oops environment	Apply
C216.5	Describe the applications of important standard protocols which are used in oops	Create

C216.6	Describe the important characteristics of oops	Remember

II/II (R20)

	Electronic Circuit Analysis (C221)	
C221.1	Analyze the amplifier circuits using small signal high frequency model	Analyze
C221.2	**A**nalyze the different types of the coupled amplifiers and their performance characteristics	Analyze
C221.3	Describe and analyze the different types of feedback amplifiers.	Analyze
C221.4	Analyze and Design oscillator Circuits.	Create
C221.5	**A**nalyze different types of power amplifiers and compare them in terms of efficiency and also Analyze the effects of cascading on single, double tuned amplifiers on bandwidth and their stability.	Analyze
	DICD(222)	
C222.1	Understand the structure of commercially available digital integrated circuit families.	Understand
C222.2	Learn the IEEE Standard 1076 Hardware Description Language (VHDL).	Understand
C222.3	Model complex digital systems at several levels of abstractions, behavioral, structural, and rapid system prototyping	Create
C222.4	Analyze and design basic digital circuits with combinatorial logic circuits using VHDL.	Analyze
C222.5	Analyze and design basic digital circuits with sequential logic circuits using VHDL.	Analyze
	Analog Communications (C223)	
C223.1	Explain the basic concepts of Analog Communication	Understand
C223.2	Explain the analog communcation systems using amplitude modulaton and demodulation	Understand
C223.3	Explain the analog communication systems using angle modulation and demodulation	Understand
C223.4	Evaluate the performance of fundamental blocks constituting various analog modulation techniques	Evaluate
C223.5	Analyze the impact of noise in various analog communication systems	Analyze
	Linear Control Systems (C224)	
C224.1	Understand the concepts of feedback and its advantages to various control systems	Understand
C224.2	Discuss the characteristics of the given system in terms of the transfer function	Apply

C224.3	Analyze the system in terms of absolute stability and relative stability by different approaches	Analyze
C224.4	Analyse the frequency response by applying the performance metrics to design the control system .	Analyze
C224.5	Design different control systems as per given specifications and also the concepts of controllability and observability	Evaluate

Management and Organizational Behavior (C225)		
C225.1	Explain the concept and functions of management, system approach to management	Understand
C225.2	Explain the concept of HRM and Marketing Management	Understand
C225.3	Define the concept of strategic management, generic alternate strategies	Remember
C225.4	Describe the concept of impression management and theories of motivation	Remember
C225.5	Explain the concept of Group behaviour and strategies of stress	Understand

III/I (R19)

Linear I C Applications (C311)		
C311.1	Identify different configurations of op-amp analyze the parameters of op-amp and observe the frequency response of operational amplifier	Analyze
C311.2	Understand non ideal characteristics of operational amplifier parameters	Understand
C311.3	Demonstrate linear and non applications of operational amplifiers	Apply
C311.4	Select active filter, multipliers and modulators according to the required application	Apply
C311.5	Implement various applications of special function Op-Amp ICs such as 555 IC and Analog multiplier, PLL.	Analyze
C311.6	Demonstrate and compare the performance of various types of ADC and DAC using Op-Amp	Apply
Micro Processors & Micro Controllers (C321)		
C312.1	Describe the basics of 8086 microprocessors architectures and its Functionalities.	Understand
C312.2	Design and develop 8086 Microprocessor based systems for real time applications using low level language like ALP	Analyze
C312.3	Interface external peripherals and I/O devices and program the 8086 microprocessor	Apply
C312.4	Describe the basics of 80386 and 80486 microprocessors architectures and its Functionalities.	Understand
C312.5	Describe the basics of 8051 microcontrollers architectures and its functionalities.	Analyze

C312.6	Describe the basics of PIC microcontrollers architectures and its functionalities.	Apply

DC(313)		
C313.1	Analyze the recording of the digital data from a analog data in a compact disc	**Analyze**
C313.2	Analyze & Apply various types of digital communication methods. Eg: Mobile Communications and Computer Network.	**Analyze**
C313.3	Analyze & Calculate BER in digital communication channels..	**Analyze**
C313.4	Analyze the information rate, entropy & channel capacity in the information transmission channel.	**Analyze**
C313.5	Analyze suitable source code for the given application	**Analyze**
C313.6	Analyze & Design different error correcting codes for the given application.	**Analyze**

Electronic Measurements and Instrumentation (C314)		
C314.1	Discuss the structure of different analog instruments and its characteristics	Understand
C314.2	Analyze different signal generators and its working	Analyze
C314.3	Illustrate different CRO's and its working, applications	Analyze
C314.4	Measure different parameters using bridges and its applications.	Evaluate
C314.5	Analyze different transducers and its working, applications.	Analyze
C314.6	Evaluate the different Physical Parameters of different transducers.	Evaluate

DSDH(315)		
C315.1	Understand the architecture of FPGAs, tools used in modelling of digital design	Understand
C315.2	Analyze and design basic digital circuits with combinatorial logic circuits using VerilogHDL	**Analyze**
C315.3	Analyze and design basic digital circuits with sequential logic circuits using VerilogHDL	**Analyze**
C315.4	Model complex digital systems at several levels of abstractions	Apply
C315.5	Design real time applications such as vending machine and washing machines etc	**Create**

	VLSI Design (C322)	

C322.1	Demonstrate the Fabrication of IC and Calculate compute electrical properties of MOS Circuits.	Apply
C322.2	Design various gates, adders, Multipliers and Memories using stick diagrams, Layouts and apply design rules to get Layout of IC	Create
C322.3	Design the digital circuits by applying the basic circuit concepts such as sheet resistance, delay, area of capacitance.	Create
C322.4	Design the Subsystems with CMOS Technology for various static CMOS Combinational and Sequential logic circuits at the transistor level including mask layout	Create
C322.5	Design the digital circuits by using the techniques of ASIC and FPGA design flow.	Create
C322.6	Demonstrate VHDL synthesis, simulation, design captures tools, design verification tools and build a Boolean function using FPGA IC	Create

Digital Signal Processing(C323)

C323.1	Interpret, represent and process discrete/digital signals & systems and Discuss the properties of LTI systems in terms of z-transforms	**Understand**
C323.2	Compute and analyze signal spectra using DFT/FFT algorithms.	**Analyze**
C323.3	Design IIR filters to suit specific requirements for specific applications and basic structures of IIR Systems.	**Create**
C323.4	Design FIR filters to suit specific requirements for specific applications and basic structures of FIR Systems.	**Create**
C323.5	Design multi rate digital signal processing of signals through system	**Create**
C323.6	Discuss the architecture of a digital signal processor and some programming issues in floating-point digital signal processor	**Understand**

DICD(324)

C324.1	Understand the concepts ofMOSDesign	Understand
C324.2	Design and analysis of Combinational MOS Circuits	Create
C324.3	Design and analysis of Sequential MOS Circuits	Create
C324.4	Extend the Digital IC Design to Different Applications	Apply
C324.5	Understand the Concepts of Semiconductor Memories, Flash Memory, RAM array organization	Understand

DM (C325)

C325.1	Summarize the architecture of data warehouse and Similarity, Dissimilarity measures for any given raw data.	Understand
C325.2	Apply different Preprocessing Techniques	Apply
C325.3	Construct a decision tree and solve the problem of classification.	Apply
C325.4	Compare Apriori and FP-growth association rule mining algorithms for frequent item set generation.	Analyze
C325.5	Apply suitable clustering algorithm for the given data set.	Apply
	IOT(C326)	
C326.1	Understand internet of Things and its hardware and software components.	**Understand**
C326.2	To learn and understand elements of IOT system.	**Understand**
C326.3	Demonstrate the communication protocol used to connect the various connecting devices & Explain Internet connectivity principles & Application layer protocols.	**Apply**
C326.4	Identify the data acquisition, storage and business models used in IOT.	**Understand**
C326.5	Design real time IOT based applications.	**Create**

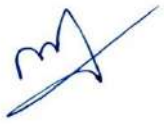
IV-I (R-19)

Radar Systems (C411)		
C411.1	Evaluate the range of the target by Considering various parameters with the help of Radar Range equation.	Evaluate
C411.2	Analyze the principle of FM-CW Radar and Estimate the altitude of the aircraft	Analyse
C411.3	Differentiate the principle and performance of MTI and Pulse Doppler Radar	Analyse
C411.4	Apply the essential principles of various types of tracking Radars.	Apply
C411.5	Review the operation of various types of Radar receivers and receiving antennas,	Understand
C411.6	Describe various types of Radar Displays and Examine them in real time Applications	Apply
Digital Image Processing (C412)		
C412.1	Discriminate the different types of images and analyze the image using based on pixel values and frequency components	Understand
C412.2	Implement the various image enhancement techniques on both spatial and frequency domains based on the application and variation in the performance levels	Apply

C412.3	Interpret image restoration process in real time under blur and noisy environments.	Apply
C412.4	Apply and evaluate segmentation and morphological techniques on digital images.	Analyze
C412.5	Apply and evaluate various image compression techniques and categorize image segmentation techniques on different digital images for specific criteria	Evaluate
C412.6	Analyze the color image processing techniques.	Evaluate
Computer Networks (C413)		
C413.1	Define the fundamentals and basic principles of computer networks	Remember
C413.2	Describe the Fourier analysis of the Physical Layer	Analyze
C413.3	Describe the various data link layer protocol techniques regarding communication system	Understand
C413.4	Describe Medium Access control Sub Layer	Understand
C413.5	Discuss various routing algorithms such as static routing and dynamic routing	Understand
C413.6	Describe the transport layer and application layer of OSI	Understand
Optical Communications (C414)		
C414.1	Define the basic elements of optical fiber communication link, structure, Propagation and transmission properties of an optical fiber.	Remember
C414.2	Explain the different types of fibers and attenuation and dispersion losses in optical fibers	Understand
C414.3	Describe the types of fiber connectors for combining optical fibers and losses at fiber Joint	Understand
C414.4	Describe the principles of optical sources, optical detectors and power launching, coupling methods.	Understand
C414.5	Analyze the characteristics of optical fiber receivers	Analyze
C414.6	Design a optical fiber communication link and estimation of performance of optical link	Create
Electronic Switching Systems (C415A)		
C415A.1	Evaluate the time and space parameters of a switched signal	Remember
C415A.2	Establish the digital signal path in time and space, between two terminals	Apply
C415A.3	Evaluate the inherent facilities within the system to test some of the SLIC, CODEC and digital switch functions.	Apply
C415A.4	Investigate the traffic capacity of the system..	Analyze
C415A.5	Evaluate methods of collecting traffic data	Understand
C415A.6	Evaluate the method of interconnecting two separate digital switches.	Understand
Embedded Systems (C416A)		
C416A.1	Describe the differences between the general computing system and the embedded system, also recognize the classification of embedded systems	Remember

C416A.2	Discuss the I/O types and examples, Serial Communication devices, Parallel device ports by using embedded hardware.	Understand
C416A.3	Develop an application using embedded software design	Create
C416A.4	Design real time embedded systems using the concepts of RTOS	Create
C416A.5	Illustrate the Embedded Software Development Process and tools.	Analyze
C416A.6	Develop an embedded system implementation and testing using hardware and translation tools.	Create
Cellular Mobile Communications (C421)		
C421.1	Analyze cellular mobile radio systems.	Analyze
C421.2	Analyze various types of Interferences and cell traffic in Mobile communication system	Analyze
C421.3	Design of various types of Antennas for Mobile communication systems.	Design
C421.4	Analyse & Design channel assignment for various mobile applications.	Design
C421.5	Analyse types of Handoffs & Dropped calls in mobile communication system.	Analyze
C421.6	Analyze types of digital cellular networks	Analyze
Electronic Measurements and Instrumentation (C422)		
C422.1	Discuss the structure of different analog instruments and its characteristics	Understand
C422.2	Analyze different signal generators and its working	Analyze
C422.3	Illustrate different CRO's and its working, applications	Analyze
C422.4	Measure different parameters using bridges and its applications.	Evaluate
C422.5	Analyze different transducers and its working, applications.	Analyze
C422.6	Evaluate the different Physical Parameters of different transducers.	Evaluate
Course Name: Satellite Communications (C423)		
C423.1	Describe about History of satellite communications and its importance	Understand
C423.2	Summarize different types of satellites with orbital mechanics and launching methods	Understand
C423.3	Demonstrate satellite subsystems	Apply
C423.4	Calculate and evaluate the link power budget in satellites Rank and justify various multiple accessing techniques	Evaluate
C423.5	Analyze the need of earth station and choose the type of antenna	Analyze
C423.6	Demonstrate the impacts of GPS, and Navigation design for tracking and launching of satellite	Apply
Wireless sensors & Networks (C424A)		

C424A.1	Understand the basics , applications and architectures of Wireless sensor networks	Understand
C424A.2	Understand the various types of network technologies	Understand
C424A.3	Understand the various types of MAC protocols	Understand
C424A.4	Understand the concept of routing protocols for ADHOC wireless networks	Understand
C424A.5	Understand the concepts of transport layer and security protocols	Understand
C424A.6	Understand the security, sensor network platform and tools and applications of wireless sensor networks	Understand
	Seminor(C425)	
C425.1	Identify recent technical topics from interested domains.	
C425.2	Analyze the applicability of modern software tools and technology.	
C425.3	Develop Presentation and Communication skills.	
C425.4	Develop Technical report preparation skills.	
	Project(C426)	
C426.1	Describe the abstract of the project	
C426.2	Collect the information about various existing	
	conservatory management systems and smart	
	grids.	
C426.3	Identify the time duration and cost required to	
	develop the project	
C426.4	Implement and test the project which is useful to	
	the society	
C426.5	Describe the summary of the project and identify	
	the impact of the project in the society	
C426.6	Demonstrate the project individual and in a group	



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SRI VASAVI INSTITUTE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Course Outcomes (CO)

A.Y: 2021-22 Yr-Sem: II-I Sem Branch: CSE

At the end of the course students able to learn

	Course Outcomes(CO)	Blooms Taxonomy
	Mathematics-III(C211)	
C211.1	Apply scalar ,vector fields ,scalar potential function and compute the gradient, divergence and curl.Use Vector integral theorems to facilitate vector integration	Apply
C211.2	Evaluatethe general solutions to linear ordinary differential equations by using Laplace transform.	Evaluate
C211.3	Find the Fourier series of continuous , finite discontinuities and periodic functions.Find the Fourier transforms of certain functions and integral transforms.	Understand
C211.4	To solve first order linear and non-linear partial differential equations in different standard forms.	Apply
C211 .5	Find the complete solution of a non-homogeneous differential equation as a linear combination of the complementary function and a particular solution.	Understand
	OOPS through C++(C212)	
C212.1	List the key concepts of Object Oriented Programming and Identify the benefits of object oriented design.	Remember
C212.2	Define and Describe the concepts of class, method, constructor, destructor, instance, overloading and Scope rules	Understand
C212.3	Implement the concepts of Inheritance, Operator overloading and abstract classes	Apply
C212.4	Adequately use the concepts of Polymorphism and Virtual Functions	Apply
C212.5	Demonstrate need of generic programming and exception handling	Apply
	Operating Systems(C213)	
C213.1	Explain the structure of OS and basic architectural components involved in OS	Remember
C213.2	Implement various process scheduling algorithms and Solve Different Process Synchronization Problems	Apply
C213.3	Compare and contrast various memory management schemes and page-replacement algorithms	Analyze

C213.4	Implement various deadlock algorithms and different file system structures	Apply
C213.5	Describe system protection and system security	Understand
	Software Engineering(C214)	
C214.1	Explain the basic terminology used in software engineering	Understand
C214.2	Converting an Object oriented design into high quality executable code	Understand
C214.3	Skills to design , implement ,and execute test cases at the unit and integration level	Understand
C214.4	Design architectural styles and class based components	Analyze
C214.5	Compare conventional and agile software methods	Understand
	Mathematical Foundations of Computer Science(C215)	
C215.1	Write an argument using logical notation and determine if the argument is or is not valid. Demonstrate the ability to write and evaluate a proof or outline the basic structure of and give examples of each proof technique described.	Remember
C215.2	Understand the basic principles of sets and operations in sets.Prove basic set equalities. Demonstrate an understanding of relations and functions and their propertiesTo learn basic definitions groups, monoids, subgroups, semi groups and rings.	Understand
C215.3	Solving the Permutations and Combinations Problems,Overview of number theory, basic algorithms in number theory	Apply
C215.4	Solving homogeneous and non-homogeneous recurrence relations.	Apply
C215.5	Demonstrate different traversal methods for trees and graphs.	Apply
	OBJECT ORIENTED PROGRAMMING THROUGH C++ LAB(C216)	
C216.1	List the key concepts of Object Oriented Programming and Identify the benefits of object oriented design.	**Remember**
C216.2	Define and Describe the concepts of class, method, constructor, destructor, instance, overloading and Scope rules	**Understand**
C216.3	Implement the concepts of Inheritance, Operator overloading and abstract classes	**Apply**
C216.4	Adequately use the concepts of Polymorphism and Virtual Functions	**Apply**
C216.5	Demonstrate need of generic programming and exception handling	**Apply**
C216.6	Design and implement a program to solve any given problem using STL Programming model	**Create**
	OPERATING SYSTEMS(C217)	

C217.1	Learn Unix utilities and Unix file system and file access control	**Remember**
C217.2	Implement Different CPU-Scheduling Algorithms and process Synchronization Techniques	**Understand**
C217.3	Compare Different Memory-Management Strategies And Page replacement Algorithms	**Apply**
C217.4	Understand Deadlock Prevention, Avoidance and various File Allocation methods	**Apply**
C217.5	Discuss Types of Threads and Issues	**Apply**
	SOFTWARE ENGINEERING(C218)	
C218.1	Able to elicit, analyze and specify software requirements through a predictive working relationship.	Understand
C218.2	Prepare SRS document, design document , test cases, software configuration.	**create**
C218.3	Develp function oriented and object oriented software design..	**Apply**
C218.4	Use modern engineering tools necessary for software project management.	**Understand**
C218.5	Generate the test cases for software testing.	**Apply**
	Applications of Python-NumPy(C219)	
C219.1	Explain how data is collected, managed and stored for processin	**Understand**
C219.2	Understand the workings of various numerical techniques, different descriptive measures of Statistics, correlation and regression to solve the engineering problems	**Understand**
C219.3	Understand how to apply some linear algebra operations to n-dimensional arrays	**Understand**
C219.4	Use NumPy perform common data wrangling and computational tasks in Python	**Apply**

Course Outcomes (CO)

A.Y: 2021-22 Yr-Sem: III-I Sem Branch: CSE

	Course Outcomes(co)	Blooms Taxonomy
	Data Warehousing and Mining(C311)	
C311.1	Draw and Explanation of the Architecture of Data Ware Housing	Apply
C311.2	Explain Various functionalities of Data Mining	Understand
C311.3	Explain the need and importance of preprocessing techniques	Understand
C311.4	Explain the general approach to solving a classification problem	Understand
C311.5	Examine different Clustering algorithms	Analyze
	Computer Networks(C312)	
C312.1	Illustrate the OSI and TCP/IP reference model	Understand
C312.2	Analyze MAC layer protocols and LAN technologies	Analyze
C312.3	Design applications using internet protocols	Create
C312.4	Implement routing and congestion control algorithms	Understand
C312.5	Develop application layer protocols	Create
	Compiler Design(C313)	
C313.1	Define basic concepts of compiler and its phases	Remember
C313.2	Recognize the tokens	Understand
C313.3	Classify the various types of grammars and parsers	Understand
C313.4	Translate and interpret the different type of grammars	Apply
C313.5	Explain various storage organization methods and target code generation strategies	Understand
	Artificial Intelligence(C314)	
C314.1	Demonstrate fundamental understanding of the Artificial Intelligence (AI) ,Intelligent systems and its foundations	Apply
C314.2	Understand state space and its searching strategies.	Understand

C314.3	Apply basic principles of propositional and predicate logic.	Apply
C314.4	Apply knowledge representation, reasoning in real world problems	Apply
C314.5	Understand Basics of Expert systems, probability theory and fuzzy logic	Understand
	SOftware Testing Methodologies(C315)	
C315.1	Explain the basic testing procedures	Understand
C315.2	Explain the need and importance of Transaction Flow Testing.	Understand
C315.3	Explain the generating test cases and test suites.	Understand
C315.4	Implement the logic based testing with applications.	Apply
C315.5	Explain the graph matrices and applications	Understand
	COMPUTER NETWORKS LAB (C316)	
C316.1	Apply the basics of Physical layer in realtime applications	Apply
C316.2	Apply data link layer concepts,design issues,and protocols	Apply
C316.3	Apply network layer routing protocols and IP addressing	Apply
C316.4	Implement the functions of application layer and Presentation layer paradigms and protocols	Apply
	AI Tools & Techniques Lab (C317)	
C317.1	Recognise the use of Prolog to solve practical problems in computer science and artificial intelligence	understand
C317.2	Outline logic foundations of Prolog.	understand
C317.3	Identify appropriate AI methods to solve a given problem	anlayze
	DATA MINING LAB(C318)	
C318.1	Extend the functionality of R by using add-on packages	Understand
C318.2	Examine data from files and other sources and perform various data manipulation tasks on them	Apply
C318.3	Code statistical functions in R	Understand
C318.4	Use R Graphics and Tables to visualize results of various statistical operations on data.	Apply
C318.5	Apply the knowledge of R gained to data Analytics for real life applications	Apply

Course Outcomes (CO)

A.Y: 2021-22 Yr-Sem: IV-I Sem Branch: CSE

	Cryptography and Network Security(C411)	Blooms Taxonomy
C411.1	Use of substitution and transposition techniques	Remember
C411.2	Differentiate block ciphers and its modes of operation	Understand
C411.3	Use number theory knowledge in public key cryptographic algorithms.	Apply
C411.4	Illustrate Hash Algorithms and digital signatures for online authentication.	Apply
C411.5	Describe various mail security protocols	Analyze
C411.6	Explain password protection mechanisms.	Evaluate
	Software Architecture and Design Pattern(C417)	
C417.1	Understand inter relationships, principles and guidelines governing architecture	Understand
C417.2	Analyze the architecture and build the system from the components	Analyze
C417.3	Prepare creational patterns that deal with object creation mechanisms	Apply
C417.4	Prepare structural patterns	Apply
C417.5	Learn behavioral patterns	Understand
C417.6	Classify various case studies	Understand
	Web Technologies(C413)	
C413.1	Identify the elements and attributes of a web page HTML and DHTML.	Create
C413.2	Able to develop dynamic web pages using JAVA SCRIPT.	Apply
C413.3	Interpret the role of XML in web applications and write a well formed / valid XML document Recognize the importance of AJAX	Understand
C413.4	Illustrate server-side programming through PHP	Apply
C413.5	Describe the basics of Perl language for text processing and CGI Programming	Understand
C413.6	Demonstrate the use of Ruby language for building web applications	Apply
	Managerial Economics and Financial Analysis(C414)	
C414.1	Explain the concept and importance of management and managerial problems	Understand

C414.2	Describe an idea of production methods and technical relationship between input and output	Understand
C414.3	Determine the types of market and pricing methods and strategies	Understand
C414.4	Describe the types of industrial organization	Understand
C414.5	Analyze the financial statements.	Analyze
C414.6	Evaluate the investment proposal in projects	Evaluate
	Big Data Analytics(C415)	
C415.1	Explain the concepts of collection classes in java.	Understand
C415.2	Explain the concepts of HDFS and Map Reduce programming model	Understand
C415.3	construct applications using Map Reduce programming model.	create
C415.4	Identify the use of Writable classes and interfaces in Map Reduce programming model	Understand
C415.5	Solve problems with big data using Pig Latin.	Apply
C415.6	Organize structural data using HiveQL.	Analyze
	Software Project Management(C416)	
C416.1	Explain Stepwise project planning and management Activities	Understand
C416.2	Define Project life cycle phases and process frame work	Remember
C416.3	Differentiate Effort Estimation Through SLOC COCOMO, Use case based and critical path analysis	Analyze
C416.4	Demonstrate the Risk management through PERT techniques	Apply
C416.5	Construct a frame work for monitoring Cost Estimation	Creating
C416.6	Define quantitative quality management planning	Remember
	Software Architecture& Design Patterns Lab(C417)	
C417.1	Understand interrelationships, principles and guidelines governing architecture and evolution over time	Understand
C417.2	Analyze the architecture and build the system from the components	Analyze
C417.3	Prepare creational patterns that deal with object creation mechanisms	Apply
C417.4	Prepare structural patterns that ease the design by identifying a simple way to realize relationships among entities.	Apply
C417.5	**L**earn behavioral patterns that identify common communication patterns between objects and realize these patterns.	Analyze
C418.6	Classify various case studies	Understand
	WEB TECHNOLOGIES(C418)	
C418.1	To acquire knowledge of XHTML, Java Script and XML to develop web applications	Understand
C418.2	Ability to develop dynamic web content using Java Servlets and JSP	Analyze
C418.3	To understand JDBC connections and Java Mail API	Understand
C418.4	To understand the design and development process of a complete web application	Understand

Course Outcomes (CO)

A.Y: 2021-22 Yr-Sem: II-II Sem Branch: CSE

	Course Outcomes(CO)	Blooms Taxonomy
	PROBABILITY & STATISTICS (C221)	
C221.1	Apply scalar ,vector fields ,scalar potential function and compute the gradient, divergence and curl.Use Vector integral theorems to facilitate vector integration	Apply
C221.2	Evaluatethe general solutions to linear ordinary differential equations by using Laplace transform.	Evaluate
C221.3	Find the Fourier series of continuous , finite discontinuities and periodic functions.Find the Fourier transforms of certain functions and integral transforms.	Understand
C221.4	To solve first order linear and non-linear partial differential equations in different standard forms.	Apply
C221 .5	Find the complete solution of a non-homogeneous differential equation as a linear combination of the complementary function and a particular solution.	Understand
	DATA BASE MANAGEMENT SYSTEMS(C222)	
C222.1	Describe a relational database and object-oriented database	Remember
C222.2	Create, maintain and manipulate a relational database using SQL	Understand
C222.3	Describe ER model and normalization for database design	Apply
C222.4	Examine issues in data storage and query processing and can formulate appropriate solutions	Apply
C222.5	Outline the role and issues in management of data such as efficiency, privacy, security, ethical responsibility, and strategic advantage	Apply
	FOEMAL LANGUAGES AND AUTOMATA THEORY(C223)	
C223.1	Design the DFA and NFA after understanding the core concepts in automata theory and formal languages.	Remember
C223.2	Describe the equivalence of regular expression and Finite automata and different types of grammars	Apply

C223.3	Understand the concept of context free grammar and normal forms	Analyze
C223.4	Design pushdown automata and the equivalent context free grammars	Apply
C223.5	Understand Turing Machine computational model and concepts such as decidability and intractability.	Understand
	JAVA PROGRAMMING (C224)	
C224.1	Discuss object oriented programming concepts and Java Basics	Understand
C224.2	Use Classes and Objects in JAVA Programming	Understand
C224.3	Implement inheritance,Packages and Exception handling concepts	Understand
C224.4	Execute Multi-Threading concepts and Input output Streams	Analyze
C224.5	Design and implement Applet and event handling mechanisms in application programs	Understand
	MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS (C225)	
C225.1	Explain the concept and importance of management and managerial problems	Remember
C225.2	Describe an idea of production methods and technical relationship between input and output	Understand
C225.3	Determine the types of market and pricing methods and strategies	Apply
C225.4	Describe the types of industrial organization	Apply
C225.5	Analyze the financial statements.	Apply
	DATA BASE MANAGEMENT SYSTEMS LAB(C226)	
C226.1	Utilize SQL to execute queries for creating database and performing data manipulation operations	Apply
C226.2	Examine integrity constraints to build efficient databases	Analyze
C226.3	Apply Queries using Advanced Concepts of SQL	Apply
C226.4	Build PL/SQL programs including stored procedures, functions, cursors and triggers	create
C226.1	Utilize SQL to execute queries for creating database and performing data manipulation operations	Apply
	R-PROGRAMMING LAB(C227)	

C227.1	Access online resources for R and import new function packages into the R workspace	Understand
C227.2	Import, review, manipulate and summa data-sets in R	Understand
C227.3	Explore data-sets to create testable hypotheses and identify appropriate statistical tests	Apply
C227.4	Perform appropriate statistical tests using R	Analyze
C227.5	Create and edit visualizations with R	Apply
	JAVA PROGRAMMING LAB(C228)	
C228.1	Discuss object oriented programming concepts	Understand
C228.2	Use Classes and Objects in JAVA Programming	Apply
C228.3	Implement inheritance and Exception handling concepts	Apply
C228.4	Execute Multi-Threading concepts	Apply
C228.5	Design and implement Applet and event handling mechanisms in application programs	Create
C228.6	Use swings aspects in graphical interactive application development	Apply
	SKILL ORIENTED COURSE-II:APPLICATIONS OF PYTHON PANDAS(C229)	
C229.1	Use Pandas to create and manipulate data structures like Series and DataFrames.	Analyze
C229.2	Experiment with arrays, queries, and dataframes.	Analyze
C229.3	Apply dataframe structures for cleaning and processing and manipulating files	Apply
C229.4	Understand best practices for creating basic charts	Understand

Course Outcomes (CO)

A.Y: 2021-22 Yr-Sem: III-II Sem Branch: CSE

	Course Outcomes(co)	Blooms Taxonomy
	WEB TECHNOLOGIES(C321)	
C321.1	Identify the elements and attributes of a web page HTML and DHTML.	Create
C321.2	Able to develop dynamic web pages using JAVA SCRIPT.	Apply
C321.3	Interpret the role of XML in web applications and write a well formed / valid XML document Recognize the importance of AJAX	Understand
C321.4	Illustrate server-side programming through PHP	Apply
C321.5	Demonstrate the use of Ruby language for building web applications	Apply
	DISTRIBUTED SYSTEMS(C322)	
C322.1	To understand the foundations of distributed systems	Understand
C322.2	To learn issues related to clock Synchronization and the need for global state in distributed systems	Understand
C322.3	To learn distributed mutual exclusion and deadlock detection algorithms	Understand
C322.4	To understand the significance of agreement, fault tolerance and recovery protocols in Distributed Systems	Understand
C322.5	To learn the characteristics of peer-to-peer and distributed shared memory systems	Apply
	DESIGN AND ANALYSIS OF ALGORITHMS(C323)	
C323.1	Describe asymptotic notation used for denoting performance of algorithms	Understand
C323.2	Analyze the performance of a given algorithm and denote its time complexity using the asymptotic notation for recursive and non-recursive algorithms	Analyze
C323.3	List and describe various algorithmic approaches	understand
C323.4	Solve problems using divide and conquer, greedy, dynamic programming, backtracking and branch and bound algorithmic approaches	analyze

C323.5	Apply graph search algorithms to real world problems	apply
	MANAGIRIAL ECONOMICS AND FINANCIAL ANALYSIS(C324)	
C324.1	Explain the concept and importance of management and managerial problems	Understand
C324.2	Describe an idea of production methods and technical relationship between input and output	Understand
C324.3	Determine the types of market and pricing methods and strategies. Describe the types of industrial organization	Understand
C324.4	Analyze the financial statements.	Analyze
C324.5	Evaluate the investment proposal in projects	Evaluate
	MOBILE APPLICATION DEVELOPMENT(C325)	
C325.1	Explain Development Environments	Understand
C325.2	What is Multi-screen Activities	Analyze
C325.3	Create Communication between service and activity	Design
C325.4	Explain Social media Applications	Understand
C325.5	Explain how Augmented Reality Works	Understand
	POWER ELECTRONICS(C326)	
C326.1	Explain the characteristics of various power semiconductor devicesand understand the gate drivercircuits.	Understand
C326.2	Explain the operation of single-phase full wave converters and performharmonic analysis.	Understand
C326.3	Explain the operation of three phase full–wave converters and performharmonic analysis.	Understand
C326.4	Analyze the operation of different types of DC-DCconverters.	Analyze
C326.5	Explain the operation of inverters and application of PWM techniques for voltagecontrol and harmonicmitigation.	Understand
	WEB TECHNOLOGIES LAB(C327)	
C327.1	Illustrate the basic concepts of HTML and CSS & apply those concepts to design static web pages	Understand
C327.2	Identify and understand various concepts related to dynamic web pages and validate them using JavaScript	Understand
C327.3	Outline the concepts of Extensible markup language & AJAX	Design
C327.4	Develop web Applications using Scripting Languages & Frameworks	Design

C327.5	Create and deploy secure, usable database driven web applications using PHP and RUBY	Analyze

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Course Outcomes (CO)

A.Y: 2021-22 Yr-Sem: IV-II Sem Branch: CSE

	DISTRIBUTED SYATEMS(C421)	Blooms Taxonomy
C421.1	Develop a familiarity with distributed file systems	Understand
C421.2	Describe important characteristics of distributed systems and the salient architectural features of such systems	Remember
C421.3	Describe the features and applications of important standard protocols which are used in distributed systems	Analyze
C421.4	Gaining practical experience of inter-process communication in a distributed environment	Apply
C421.5	Describe the applications of important standard protocols which are used in distributed systems	Creating
C421.6	Describe important characteristics of distributed systems and the salient architectural features of such systems.	Remember
	MANAGEMENT SCIENCE(C423)	
C422.1	Describe the concept and functions of management , theories of motivation	Remember
C422.2	Explain the Principles of management, control charts	understand
C423.3	Describe the different functional areas of an organization& their responsibilities	understand
C422.4	Determine & use project management tools to schedule an engineering project	Apply
C423.5	Define the meaning of vision, mission , goals and strategies	Remember
C422.6	Explain the various contemporary issues in management practices	Understand
	MACHINE LEARNING(C422)	

C422.1	**Extract** knowledge about basic concepts of Machine Learning	Understand
C423.2	**Identify** machine learning techniques suitable for a given problem	Remember
C423.3	**Categorize** the structure of data using tree models and rule models	Analyze
C423.4	**Solve** the problems using Linear model machine learning techniques	Apply
C423.5	**Solve** the problems using Probabilistic model machine learning techniques	Apply
C423.6	**Apply** Dimensionality reduction techniques.	Apply
	ARTIFICIAL NEURAL NETWORKS(C424)	
C424.1	Interpret the basic concepts of neural networks.	**Understand**
C424.2	Use the mathematical techniques in learning mechanisms	**Apply**
C424.3	Illustration of single layer perceptron	**Analyze**
C424.4	Illustration of back propagation algorithm.	**Analyze**
C424.5	Understand radial basis function network.	**Understand**
C424.6	Describe support vector machines.	**Understand**

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Course Outcomes (CO)

A.Y: 2021-22 Yr-Sem: II-I Sem Branch: AIML

	Course Outcomes(CO)	Blooms Taxonomy
	Mathematics-III(C211)	
C211.1	Apply scalar ,vector fields ,scalar potential function and compute the gradient, divergence and curl.Use Vector integral theorems to facilitate vector integration	Apply
C211.2	Evaluatethe general solutions to linear ordinary differential equations by using Laplace transform.	Evaluate
C211.3	Find the Fourier series of continuous , finite discontinuities and periodic functions.Find the Fourier transforms of certain functions and integral transforms.	Understand
C211.4	To solve first order linear and non-linear partial differential equations in different standard forms.	Apply
C211 .5	Find the complete solution of a non-homogeneous differential equation as a linear combination of the complementary function and a particular solution.	Understand
	Mathematical Foundations of Computer Science(C212)	
C212.1	Write an argument using logical notation and determine if the argument is or is not valid. Demonstrate the ability to write and evaluate a proof or outline the basic structure of and give examples of each proof technique described.	Remember
C212.2	Understand the basic principles of sets and operations in sets.Prove basic set equalities. Demonstrate an understanding of relations and functions and their propertiesTo learn basic definitions groups, monoids, subgroups, semi groups and rings.	Understand
C212.3	Solving the Permutations and Combinations Problems,Overview of number theory, basic algorithms in number theory	Apply
C212.4	Solving homogeneous and non-homogeneous recurrence relations.	Apply
C212.5	Demonstrate different traversal methods for trees and graphs.	Apply
	Introduction to Artificial Intelligence and Machine Learning(C213)	
C213.1	Enumerate the history and foundations of Artificial Intelligence	Remember
C213.2	Apply the basic principles of AI in problem solving	Apply
C213.3	Choose the appropriate representation of Knowledge	Analyze

C213.4	Enumerate the Perspectives and Issues in Machine Learning	Apply
C213.5	Identify issues in Decision Tree Learning	Understand
	Software Engineering(C214)	
C214.1	Explain the basic terminology used in software engineering	Understand
C214.2	Converting an Object oriented design into high quality executable code	Understand
C214.3	Skills to design , implement ,and execute test cases at the unit and integration level	Understand
C214.4	Design architectural styles and class based components	Analyze
C214.5	Compare conventional and agile software methods	Understand
	OBJECT ORIENTED PROGRAMMING WITH JAVA(C215)	
C215.1	Able to realize the concept of Object Oriented Programming & Java Programming Constructs	Understand
C215.2	Able to describe the basic concepts of Java such as operators, classes, objects, inheritance, packages, Enumeration and various keywords	Understand
C215.3	Apply the concept of exception handling and Input/ Output operations	Apply
C215.4	Able to design the applications of Java & Java applet	Understand
C215.5	Able to Analyze & Design the concept of Event Handling and Abstract Window Toolkit	Analyze
	DATABASE MANAGEMENT SYSTEMS(C216)	
C216.1	Describe a relational database and object-oriented database	Remember
C216.2	Create, maintain and manipulate a relational database using SQL	Understand
C216.3	Describe ER model and normalization for database design	Apply
C216.4	Examine issues in data storage and query processing and can formulate appropriate solutions	Apply
C216.5	Outline the role and issues in management of data such as efficiency, privacy, security, ethical responsibility, and strategic advantage	Apply
	INTRODUCTION TO ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING LAB(C217)	
C217.1	Apply the basic principles of AI in problem solving using LISP/PROLOG	Remember
C217.2	Implement different algorithms in AI using LISP/PROLOG	Understand

C217.3	Develop an Expert System using JESS/PROLOG in AI	Apply
C217.4	Apply the basic principles of ML in problem solving using LISP/PROLOG	Apply
C217.5	Implement different algorithms in ML using LISP/PROLOG	Apply
	OBJECT ORIENTED PROGRAMMING WITH JAVA LAB(C218)	
C218.1	Evaluate default value of all primitive data type, Operations, Expressions, Control-flow, Strings	Understand
C218.2	Determine Class, Objects, Methods, Inheritance, Exception, Runtime Polymorphism, User defined Exception handling mechanism	create
C218.3	Illustrating simple inheritance, multi-level inheritance, Exception handling mechanism	Apply
C218.4	Construct Threads, Event Handling, implement packages, developing applets	Understand
	DATABASE MANAGEMENT SYSTEMS LAB(C219)	
C219.1	Utilize SQL to execute queries for creating database and performing data manipulation operations	Understand
C219.2	Examine integrity constraints to build efficient databases	Understand
C219.3	Apply Queries using Advanced Concepts of SQL	Understand
C219.4	Build PL/SQL programs including stored procedures, functions, cursors and triggers	Apply
	MOBILE APP DEVELOPMENT LAB(C210)	Understand
C210.1	. Identify various concepts of mobile programming that make it unique from programming for other platforms	Understand
C210.2	. Critique mobile applications on their design pros and cons	Understand
C210.3	Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces,	Understand
C210.4	Program mobile applications for the Android operating system that use basic and advanced phone features and	Understand
C210.5	Deploy applications to the Android marketplace for distribution.	APPLY

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Course Outcomes (CO)

A.Y: 2021-22 Yr-Sem: II-II Sem Branch: AIML

	Course Outcomes(CO)	Blooms Taxonomy
	PROBABILITY AND STATISTICS **(C221)**	
C221.1	Classify the concepts of data science and its importance	Apply
C221.2	Interpret the association of characteristics and through correlation and regression tools	Evaluate
C221.3	Make use of the concepts of probability and their applications	Understand
C221.4	Apply discrete and continuous probability distributions	Apply
C221 .5	Design the components of a classical hypothesis test	Understand
	COMPUTER ORGANIZATION **(C222)**	
C222.1	Develop a detailed understanding of computer systems	Remember
C222.2	Cite different number systems, binary addition and subtraction, standard, floating-point, and micro operations	Understand
C222.3	Develop a detailed understanding of architecture and functionality of central processing unit	Apply
C222.4	Exemplify in a better way the I/O and memory organization	Apply
C222.5	Illustrate concepts of parallel processing, pipelining and inter processor communication	Apply
	DATA WAREHOUSING AND MINING (C223)	
C223.1	Summarize the architecture of data warehouse	Remember
C223.2	Apply different preprocessing methods, Similarity, Dissimilarity measures for any given raw data.	Apply
C223.3	Construct a decision tree and resolve the problem of model overfitting	Analyze
C223.4	Compare Apriori and FP-growth association rule mining algorithms for frequent itemset generation	Apply

C223.5	Apply suitable clustering algorithm for the given data set	Understand
	FORMAL LANGUAGES AND AUTOMATA THEORY **(C224)**	
C224.1	Classify machines by their power to recognize languages.	Understand
C224.2	Summarize language classes & grammars relationship among them with the help of Chomsky hierarchy	Understand
C224.3	Employ finite state machines to solve problems in computing	Understand
C224.4	Illustrate deterministic and non-deterministic machines	Analyze
C224.5	Quote the hierarchy of problems arising in the computer science	Understand
	MANAGERIAL ECONOMICS AND FINANCIAL ACCOUNTANCY (C225)	
C225.1	The Learner is equipped with the knowledge of estimating the Demand and demand elasticities for a product	Understand
C225.2	The knowledge of understanding of the Input-Output-Cost relationships and estimation of the least cost combination of inputs	Understand
C225.3	The pupil is also ready to understand the nature of different markets and Price Output determination under various market conditions and also to have the knowledge of different Business Units	Apply
C225.4	The Learner is able to prepare Financial Statements and the usage of various Accounting tools for Analysis	Understand
C225.5	The Learner can able to evaluate various investment project proposals with the help of capital budgeting techniques for decision making	Analyze
	R PROGRAMMING LAB (C226)	
C226.1	Implement basic concepts of R programming, and its different module that includes conditional, looping, lists, Strings, Functions, Frames, Arrays, and File programming	Remember
C226.2	Implement the concepts of R Script to extract the data from data frames and file operations	Understand
C226.3	Implement the various statistical techniques using R.	Apply
C226.4	Extend the functionality of R by using add-on packages	Apply
C226.5	Use R Graphics and Tables to visualize results of various statistical operations on data	Apply
	DATA MINING USING PYTHON LAB **(C217)**	
C227.1	Apply preprocessing techniques on real world datasets	Remember

C227.2	Apply apriori algorithm to generate frequent itemsets	Understand
C227.3	Apply Classification and clustering algorithms on different datasets.	Apply
	WEB APPLICATION DEVELOPMENT LAB (C228)	
C228.1	Develop Single Page Applications	Understand
C228.2	Develop NodeJS & ReactJS Reusable Service	create
C228.3	Store the data in MySQL	Apply
C228.4	Get acquainted with the latest web application development trends in the IT industry	Understand
	NATURAL LANGUAGE PROCESSING WITH PYTHO (C229)	
C229.1	Explore natural language processing (NLP) libraries in Python	Understand
C229.2	Learn various techniques for implementing NLP including parsing & text processing	Understand
C229.3	Understand how to use NLP for text feature engineering	Understand

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