Department of
Civil Engineering

Course Outcomes

Academic Year 2017-18

Department of Civil Engineering

3.1.1	**Course Outcomes (COs)**

Course Name: C201- Engineering Mathematics-III (15MAT31)   Course Year: 2017-18

At the end of the course completion student will be able to:	
C201.1	Know the use of periodic signals and Fourier series to analyze circuits and system communication.
C201.2	Explain the general linear system theory for continuous time signals and digital signal processing using the Fourier Transform and Z-transform.
C201.3	Ability to know various statistical methods, Correlation, Regression analysis and curve fitting and employ numerical methods to solve algebraic and transcendental equations, Interpolation and integration.
C201.4	Gain the knowledge of Green's theorem, Divergence theorem and Stoke's theorem in various applications in the field of electromagnetic and gravitational fields and fluid flow problems and determine the externals of functions and solve the problems of calculus of variations.

Course Name: C202-Strength of Material (15CV32)   Course Year: 2017-18

At the end of the course completion student will be able to:	
C202.1	Identify different materials, their properties and calculate stress, strain, and elongation of unique and composite materials.
C202.2	Identify two dimensional principle stress system, calculate compound stresses, its components on inclined planes, Construct B.M. and S.F diagrams for beams
C202.3	Calculate bending and shear stress, and construct bending and shear stress diagrams for beams subjected to point load, UDL and couple.
C202.4	Calculate torsion and power transmitted by hollow and circular shaft, Distinguish between long and short columns and solve analytical problems for columns subjected to different end conditions.

Course Name: C203- Fluid Mechanics (15CV33)	Course Year: 2017-18

At the end of the course completion student will be able to:	
C203.1	Describe fundamentals of fluid properties and explain the measurement of pressure from instruments.
C203.2	Compute magnitude of pressure on surfaces and apply the mathematics to identify the different flow conditions.
C203.3	Analyze the energy causing motion of fluid mass to find discharge, velocity for pipe networks and from various instruments.
C203.4	Identify and classify weir, notches, orifices and mouthpieces and determine the discharge for them.

Course Name: C204- Basic Surveying (15CV34)	Course Year: 2017-18

At the end of the course completion student will be able to:	
C204.1	Define and explain the principles of surveying, types of survey, maps and determine horizontal distances by using different instruments.
C204.2	Recognize the bearings from compass and angles from theodolite, plot traverse with corrections.
C204.3	Describe and implement the principles of levelling and types of levelling.
C204.4	Describe the characteristics and methods of contouring and measurement of areas and volumes.

Course Name: C205- Engineering Geology (15CV35)	Course Year: 2017-18

At the end of the course completion student will be able to:	
C205.1	Understand the internal structure and composition of the earth.
C205.2	Comprehend the properties, occurrence and uses of minerals in various industries.
C205.3	Learn about geo-morphological agents such as river, wind, sea waves, and their implications in implementing civil engineering projects.
C205.4	Learn the application of Topographic maps, remote sensing and GIS in Civil engineering practices and natural resource management.

Course Name: C206- Building Materials And Construction (15CV36) Course Year: 2017-18

At the end of the course completion student will be able to:	
C206.1	Identify different building materials for construction, differentiate the types of foundation and design of footings.
C206.2	Differentiate types of bonds used in masonry and various components in a building and materials used in their construction.
C206.3	Different types of building components like doors, windows, staircase and materials used for their construction and design of staircases.
C206.4	Differentiate the methods for plastering, painting, form work and scaffolding for various construction practice.

Course Name:C207-Basic Material Testing Laboratory(15CVL37),Course Year: 2017-18

At the end of the course completion student will be able to:	
C207.1	Estimate tensile, torsion, shear, impact strength of mild steel, HYSD bars and draw conclusion by plotting graphs and estimate hardness value of mild steel, Aluminum, brass and copper.
C207.2	Determine compression and flexure value of wood and draw conclusions by plotting graphs.
C207.3	Determine compressive strength of brick and flexural strength of tiles.
C207.4	Execute various physical properties on aggregates, draw the conclusion based on the results and recognize the various strain measuring instruments.

Course Name: C208- Basic Surveying Practice (15CVL38)   Course Year: 2017-18

At the end of the course completion student will be able to:	
C208.1	Apply the basic principle of engineering surveying and for linear and angular measurements.
C208.2	Comprehend effectively field procedures required for a professional surveyor.
C208.3	Use techniques, skills and conventional surveying instruments necessary for engineering practice.

Course Name: C209- Engineering Mathematics-IV (15MAT41)   Course Year: 2017-18

At the end of the course completion student will be able to:	
C209.1	Use appropriate single step and multi-step numerical methods to solve first and second order ordinary differential equations arising in flow data design problems.
C209.2	Explain the idea of analyticity, potential field's residues and poles of complex potentials in field theory and electromagnetic theory.
C209.3	Employ Bessel's functions and Legendre's polynomials for tacking problems arising in continuum mechanics, hydrodynamics and heat conduction.
C209.4	Describe random variables and probability distributions using rigorous statistical methods to analyze problems associated with optimization and sampling distributions. Apply the knowledge of joint probability distributions and Markov chains in attempting engineering problems for feasible random events.

Course Name:C210-Analysis of Determinate Structures (15CV42) Course Year: 2017-18

At the end of the course completion student will be able to:	
C210.1	Apply knowledge of mathematics and engineering in analyzing determinate trusses to calculate forces in the members and also in analyzing beams to calculate slope and deflections in beams.
C210.2	Identify, formulate and solve engineering problems to determine deflection of beams and trusses using energy theorems.
C210.3	Analyze structural systems and interpret data to determine normal thrust, radial shear and bending moment in case of Arches and cables.
C210.4	Analyze beams and trusses using concepts of influence line diagram to determine reactions, Shear force and Bending moment.

Course Name: C211-Applied Hydraulics (15CV43)   Course Year: 2017-18

At the end of the course completion student will be able to:	
C211.1	Apply dimensional analysis to develop mathematical modeling and compute the Parametric values in prototype by analyzing the corresponding model Parameters.
C211.2	Design the open channels of various cross sections including optimum design sections.
C211.3	Apply Energy concepts of fluid in open channel, calculate Energy dissipation, and compute Water profiles at different conditions.
C211.4	Design turbines for the given data, and to know their operation characteristics under different operating conditions.

Course Name:C212- Concrete Technology (15CV44)	Course Year: 2017-18

At the end of the course completion student will be able to:	
C212.1	Identify physical and chemical properties of cement and admixtures.
C212.2	Describe the physical and mechanical properties of aggregate.
C212.3	Explain the fresh, hardened and durability properties of concrete.
C212.4	Design the concrete mix using IS code method and explain the mix proportions, properties and uses of Special Concrete.

Course Name:C213- Basic Geotechnical Engineering (15CV45)	Course Year: 2017-18

At the end of the course completion student will be able to:	
C213.1	Knowledge about soil formation, formulations, and procedures to determine Index properties, and also to identify and classify Soils based on Index properties.
C213.2	Describe about Soil structures, clays and clayey soil properties. Also are able to determine compaction properties of soils, and apply that knowledge to evaluate field compaction procedures.
C213.3	Explain and determine permeability properties of soils, and acquire knowledge of effective stress, seepage study and its significance in construction of Hydraulic structures
C213.4	Estimate consolidation properties of clayey soils and corresponding settlement of structures constructed on them & Will be able to explain and estimate shear strength of various soils and to measure the same both in laboratory and field.

Course Name:C214- Advanced Surveying (15CV46)	Course Year: 2017-18

At the end of the course completion student will be able to:	
C214.1	Explain the importance of curves and calculate the data required for setting out a curve in the field of civil engineering.
C214.2	Differentiate between geodetic surveying and plane surveying and explain in detail about the theory of errors.
C214.3	Define the basic concepts involved in field astronomy and application of aerial photogrammetry in the field of civil engineering.
C214.4	Identify modern surveying instruments and its applications in the field of civil engineering.

Course Name:C215- Fluid Mechanics Laboratory (15CVL47)   Course Year: 2017-18

At the end of the course completion student will be able to:	
C215.1	Calibrate flow measuring devices.
C215.2	Determine the force exerted by jet of water on vanes.
C215.3	Measure discharge and head losses in pipes.
C215.4	Understand the fluid flow patterns.

Course Name:C216-Engineering Geology Laboratory (15CVL48) Course Year: 2017-18

At the end of the course completion student will be able to:	
C216.1	Identifying the minerals and rocks and utilize them effectively in civil engineering practices.
C216.2	Understanding and interpreting the geological conditions of the area for the implementation of civil engineering projects.
C216.3	Interpreting subsurface information such as thickness of soil, weathered zone, depth of hard rock and saturated zone by using geophysical methods.
C216.4	The techniques of drawing the curves of electrical resistivity data and its interpretation for geotechnical and aquifer boundaries.

Course Name:C301- Design of RC Structural Elements (15CV51) Course Year: 2017-18

At the end of the course completion student will be able to:	
C301.1	Understand the design philosophy and principles.
C301.2	Solve engineering problems of RC elements subjected to flexure, shear and torsion.
C301.3	Demonstrate the procedural knowledge in designs of RC structural elements such as slabs, columns and footings.
C301.4	Owns professional and ethical responsibility.

Course Name:C302-Analysis of Indeterminate Structures(15CV52) Course Year:2017-18

At the end of the course completion student will be able to:	
C302.1	Determine the moment in indeterminate beams and frames having variable moment of inertia and subsidence using slope defection method
C302.2	Determine the moment in indeterminate beams and frames of no sway and sway using moment distribution method.
C302.3	Construct the bending moment diagram for beams and frames by Kani's method.

C302.4	Construct the bending moment diagram for beams and frames using flexibility method & system stiffness method.

Course Name:C303- Applied Geotechnical Engineering (15CV53) Course Year: 2017-18

At the end of the course completion student will be able to:	
C303.1	Explain the sub surface exploration, methods, Samplers, methods of drainage and dewatering.
C303.2	Compute stresses below foundations for different loads and Estimate settlements beneath foundations.
C303.3	Estimate Earth pressure behind Retaining walls and Determine F.O.S against stability of slopes in C and C-ϕ Soils.
C303.4	Estimate Bearing capacity of Foundations by Terzaghis, BIS (IS:6403), Plate load, SPT tests and also to Design Isolated & combined Footings and Capable of estimating load carrying capacity of single and group of piles.

Course Name:C304- Computer Aided Building Planning and Drawing (15CV54)
Course Year: 2017-18

At the end of the course completion student will be able to:	
C304.1	Gain a broad understanding of planning and designing of buildings.
C304.2	Prepare, read and interpret the drawings in a professional set up.
C304.3	Know the procedures of submission of drawings and Develop working and submission drawings for building.
C304.4	Plan and design a residential or public building as per the given requirements.

Course Name:C305- Railways, Harbors, Tunnel and Airports (15CV552)
Course Year: 2017-18

At the end of the course completion student will be able to:	
C305.1	Acquires capability of choosing alignment and also design geometric aspects of railway system, runway, and taxiway.
C305.2	Suggest and estimate the material quantity required for laying a railway track and also will be able to determine the hauling capacity of a locomotive.
C305.3	Develop layout plan of airport, harbor, dock and will be able relate the gained knowledge to identify required type of visual and/or navigational aids for the same.
C305.4	Apply the knowledge gained to conduct surveying, understand the tunneling activities.

Course Name:C306- Traffic Engineering (15CV561)   **Course Year: 2017-18**

At the end of the course completion student will be able to:	
C306.1	Understand the human factors and vehicular factors in traffic engineering design.
C306.2	Conduct different types of traffic surveys and analysis of collected data using statistical concepts.
C306.3	Use an appropriate traffic flow theory and to comprehend the capacity & signalized intersection analysis.
C306.4	Understand the basic knowledge of Intelligent Transportation System.

Course Name: C307 -Geotechnical Engineering Laboratory (15CVL57)
Course Year: 2017-18

At the end of the course completion student will be able to:	
C307.1	Physical and index properties of the soil.
C307.2	Classify based on index properties and field identification.
C307.3	To determine OMC and MDD, plan and assess field compaction program.
C307.4	Shear strength and consolidation parameters to assess strength and deformation characteristics.

Course Name: C308 -Concrete and Highway Materials Testing Laboratory (15CVL58)
Course Year: 2017-18

At the end of the course completion student will be able to:	
C308.1	Carry out the various tests on cement and suitability of cement in construction practices.
C308.2	Execute the various tests on fresh and hardened concrete.
C308.3	Carry out the tests on soil and aggregate to execute their suitability in construction of pavements.
C308.4	Carry out the various tests on bituminous material and conclude its suitability in the construction of pavements.

Course Name: C309 -Construction Management and Entrepreneurship (15CV61)
Course Year: 2017-18

At the end of the course completion student will be able to:	
C309.1	Define the meaning, describe the nature, explain the importance, characteristics & purpose of planning and management with its different approaches.
C309.2	Define the meaning, discuss the nature and types of organization, staffing, directing, controlling, with its techniques.
C309.3	Define the meaning of entrepreneur, explain the concept of entrepreneurship and illustrate the various steps involved in starting a small scale industry.
C309.4	List the activities of various Central, State Government agencies and to design the various steps involved in the preparation of projects.

Course Name: C310 -Design of Steel Structural Element (15CV62) Course Year: 2017-18

At the end of the course completion student will be able to:	
C310.1	Understand advantages and disadvantages of steel structures, steel code provisions, and plastic behaviour of structural steel.
C310.2	Learn Bolted connections and Welded connections.
C310.3	Design of Tension members, Compression members, built-up columns and columns splices.
C310.4	Design of simple slab base and gusseted base, laterally supported and un-supported steel beams.

Course Name: C311 - Highway Engineering (15CV63)   Course Year: 2017-18

At the end of the course completion student will be able to:	
C311.1	Acquire the capability of proposing a new alignment or re-alignment of existing roads, conduct necessary field investigation for generation of required data.
C311.2	Evaluate the engineering properties of the materials and suggest the suitability of the same for pavement construction.
C311.3	Design road geometrics, structural components of pavement and drainage.
C311.4	Evaluate the highway economics by few select methods and also will have a basic knowledge of various highway financing concepts.

Course Name: C312 -Water Supply and Treatment (15CV64)   Course Year: 2017-18

At the end of the course completion student will be able to:	
C312.1	Estimate average and peak water demand for a community.
C312.2	Evaluate available sources of water supply, qualitative and quantitatively and make appropriate choice for a community.
C312.3	Evaluate water quality and environmental significance of various parameters and plan suitable treatment system.
C312.4	Design a comprehensive water treatment and distribution system to purify and distribute water to required quality standards.

Course Name: C313 - Solid Waste Management (15CV651)   Course Year: 2017-18

At the end of the course completion student will be able to:	
C313.1	Study the present methods of solid waste management system and to analyse their drawbacks comparing with statutory rules.
C313.2	Understand different elements of solid waste management from generation of solid waste to disposal.
C313.3	Analyse different processing technologies and to study conversion of municipal solid waste to compost or biogas.
C313.4	Evaluate landfill site and to study the sanitary landfill reactions.

Course Name: C314 -Water Resources Management (15CV661)   Course Year: 2017-18

At the end of the course completion student will be able to:	
C314.1	Assess the potential of groundwater and surface water resources.
C314.2	Address the issues related to planning and management of water resources.
C314.3	Know how to implement IWRM in different regions.
C314.4	Understand the legal issues of water policy & Select the method for water harvesting based on the area.

Course Name: C315 -Software Application Laboratory(15CVL67) Course Year: 2017-18

At the end of the course completion student will be able to:	
C315.1	Able to use STAAD Pro software and analyse the elements using finite element modelling, specification of loads and boundary condition, performing analysis and interpretation of results for final design.
C315.2	Able to Create and Design the various Worksheets in M S EXCEL using several guidelines laid by BIS.
C315.3	Able to use M S Project software and acquire the skill in a professional setup to automate the work.
C315.4	Able to use the GIS applications using open source software and measure the various parameters.

Course Name: C316- Extensive Survey Project /Camp(15CVP68) Course Year: 2017-18

At the end of the course completion student will be able to:	
C316.1	Apply Surveying knowledge and tools effectively for the projects.
C316.2	Understanding Task environment, Goals, responsibilities, Task focus, working in Teams towards common goals, Organizational performance expectations, technical and behavioural competencies.
C316.3	Application of individual effectiveness skills in team and organizational context, goal setting, time management, communication and presentation skills.
C316.4	Establishing trust based relationships in teams & organizational environment and Orientation towards conflicts in team and organizational environment, Understanding sources of conflicts.

3.1.2	**CO-PO/PSO Matrices of Courses**

Course Name: C201- Engineering Mathematics-III (15MAT31)   Course Year: 2017-18

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C201.1	3	3										
C201.2	3	3										
C201.3	3	3										
C201.4	2	2										
Average	**2.75**	**2.75**										

Course Name: C202-Strength of Material (15CV32)   Course Year: 2017-18

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C202.1	1	2										2
C202.2	2	2										2
C202.3	2	2										2
C202.4	2	2										2
Average	**1.75**	**2**										**2**

Course Name: C203- Fluid Mechanics (15CV33)　　　　　　**Course Year: 2017-18**

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C203.1	1	1										
C203.2	2	1										
C203.3	2	1	1									
C203.4	2	1										
Average	**1.75**	**1**	**1**									

Course Name: C204- Basic Surveying (15CV34)   **Course Year: 2017-18**

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C204.1	2	2										1
C204.2	2	2										1
C204.3	2	2										1
C204.4	2	2										1
Average	**2**	**2**										**1**

Course Name: C205- Engineering Geology (15CV35)   **Course Year: 2017-18**

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C205.1	2	2	2									
C205.2	2	2	2									
C205.3	2	2	2									
C205.4	2	2	2									2
Average	**2**	**2**	**2**									**2**

Course Name: C206- Building Materials And Construction (15CV36) Course Year: 2017-18

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C206.1	2											1
C206.2	2	1										1
C206.3	2											1
C206.4	2	1										1
Average	**2**	**1**										**1**

Course Name:C207- Basic Material Testing Laboratory(15CVL37),Course Year:2017-18

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C207.1	3			3								
C207.2	3			3								
C207.3	3			3								
C207.4	3			3								
Average	**3**			**3**								

Course Name:C208- Basic Surveying Practice (15CVL38)   **Course Year: 2017-18**

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C208.1	2	2	2									2
C208.2	2	2	2									2
C208.3	2	2	2									2
C208.4	2	2	2									2
Average	**2**	**2**	**2**									

Course Name: C209- Engineering Mathematics-IV (15MAT41)   **Course Year: 2017-18**

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C209.1	3	3										
C209.2	3	3										
C209.3	3	3										
C209.4	3	3										
Average	**3**	**3**										

Course Name:C210-Analysis of Determinate Structures (15CV42) Course Year: 2017-18

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C210.1	3	2	2									2
C210.2	3	2	3	1								2
C210.3	3	2	2									2
C210.4	3	2	2	2								2
Average	**3**	**2**	**2.25**	**1.5**								**2**

Course Name: C211-Applied Hydraulics (15CV43)   **Course Year: 2017-18**

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C211.1	2	2	2									
C211.2	2	2	2									
C211.3	2	2	2									
C211.4	2	2	2									
Average	**2**	**2**	**2**									

Course Name:C212- Concrete Technology (15CV44)   **Course Year: 2017-18**

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C212.1	2	2	2									2
C212.2	2	2	2									2
C212.3	2	2	2									2
C212.4	2	2	2									2
Average	**2**	**2**	**2**									**2**

Course Name:C213- Basic Geotechnical Engineering (15CV45)   **Course Year: 2017-18**

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C213.1	2	2	1									1
C213.2	2	2	1									1
C213.3	2	2	1									1
C213.4	2	2	1									1
Average	**2**	**2**	**1**									**1**

Course Name:C214- Advanced Surveying (15CV46)   **Course Year: 2017-18**

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C214.1	2	2	2									
C214.2	1	2	2									
C214.3	2	1	2									
C214.4	1	1	2	2	2							
Average	**1.5**	**1.5**	**2**	**2**	**2**							

Course Name:C215- Fluid Mechanics Laboratory (15CVL47)   **Course Year: 2017-18**

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C215.1	2	2	2	1								1
C215.2	2	2	2	1								1
C215.3	2	2	2	1								1
C215.4	2	2	2	1								1
Average	**2**	**2**	**2**	**1**								**1**

Course Name:C216-Engineering Geology Laboratory (15CVL48) Course Year: 2017-18

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C216.1	1			1								1
C216.2	1			1								1
C216.3	1			1								1
C216.4	1			1								1
Average	**1**			**1**								**1**

Course Name:C301- Design of RC Structural Elements (15CV51) Course Year: 2017-18

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C301.1	1	2						2				2
C301.2	2							2				2
C301.3	2	2	2					2				2
C301.4	2							2				2
Average	**1.75**	**2**	**2**					**2**				**2**

Course Name:C302-Analysis of Indeterminate Structures(15CV52) Course Year:2017-18

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C302.1	3	2	2									2
C302.2	3	2	3									2
C302.3	3	2	2									2
C302.4	3	2	2									2
Average	**3**	**2**	**2.3**									**2**

Course Name:C303- Applied Geotechnical Engineering (15CV53) Course Year: 2017-18

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C303.1	2	1						1				1
C303.2	2	2						2				2
C303.3	2	2						2				2
C303.4	2		2					2				2
Average	**2**	**1.67**	**2**					**1.75**				**1.75**

Course Name:C304- Computer Aided Building Planning and Drawing (15CV54)

Course Year: 2017-18

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C304.1	1	2			2							2
C304.2	1	2		2	2							2
C304.3	1	2			2							2
C304.4	1	2		2	2							2
Average	**1**	**2**		**2**	**2**							**2**

Course Name:C305- Railways, Harbors, Tunnel and Airports (15CV552)

Course Year: 2017-18

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C305.1	2	2										
C305.2	2	2										
C305.3	2	2										
C305.4	2	2										
Average	**2**	**2**										

Course Name:C306- Traffic Engineering (15CV561)   **Course Year: 2017-18**

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C306.1	2	2										2
C306.2	2	2										2
C306.3	2	2	2	2								2
C306.4	2											2
Average	**2**	**2**	**2**	**2**								**2**

Course Name: C307 -Geotechnical Engineering Laboratory (15CVL57)

Course Year: 2017-18

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C307.1	2			2				2	2			
C307.2	2			2				2	2			
C307.3	2			2					2			
C307.4	2			2					2			
Average	**2**			**2**				**2**	**2**			

Course Name: C308 -Concrete and Highway Materials Testing Laboratory (15CVL58)
Course Year: 2017-18

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C308.1	3	3	3									2
C308.2	3	3	3									2
C308.3	3	3	3									2
C308.4	3	3	3									2
Average	**3**	**3**	**3**									**2**

Course Name: C309 -Construction Management and Entrepreneurship (15CV61)
Course Year: 2017-18

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C309.1						2	2	2		1	2	1
C309.2						2	2	2		1		1
C309.3						2	2	2		1		1
C309.4						1	1	1		1	2	
Average						**1.75**	**1.75**	**1.75**		**1**	**2**	**1**

Course Name: C310 -Design of Steel Structural Element (15CV62) Course Year: 2017-18

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C310.1	2	3	3									2
C310.2	2	3	3					2				2
C310.3	2	3	3					2				2
C310.4	2	3	3					2				2
Average	**2**	**3**	**3**					**2**				**2**

Course Name: C311 - Highway Engineering (15CV63) **Course Year: 2017-18**

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C311.1	2		2									2
C311.2	2		2									2
C311.3	2	2	2									2
C311.4	2	2	2									2
Average	**2**	**2**	**2**									**2**

Course Name: C312 -Water Supply and Treatment (15CV64) **Course Year: 2017-18**

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C312.1			2				1					
C312.2	1						2					
C312.3	1						2					
C312.4							1					
Average	**1**		**2**				**1.5**					

Course Name: C313 - Solid Waste Management (15CV651) **Course Year: 2017-18**

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C313.1			2				1					1
C313.2	2						2					
C313.3	2						2					
C313.4			2				1					
Average	**2**		**2**				**1.5**					**1**

Course Name: C314 -Water Resources Management (15CV661) **Course Year: 2017-18**

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C314.1	1					1	2					
C314.2	1					2	2					2
C314.3	1					1	2					2
C314.4	1					1	2					2
Average	**1**					**1.25**	**2**					**2**

Course Name: C315 -Software Application Laboratory(15CVL67) Course Year: 2017-18

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C315.1	2		2		2			2				2
C315.2	2		2		2							2
C315.3	2		2		2							2
C315.4	2		2		2							2
Average	**2**		**2**		**2**			**2**				**2**

Course Name: C316- Extensive Survey Project /Camp(15CVP68) Course Year: 2017-18

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C316.1	2	1				2	2		2			1
C316.2	2	1				2	2		2			1
C316.3	2	1				2	2		2			1
C316.4	2	1				2	2		2			1
Average	**2**	**1**				**2**	**2**		**2**			**1**

Course Name: C201- Engineering Mathematics-III (15MAT31)
Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C201.1			
C201.2			
C201.3			
C201.4			
C201.5			
Average			

Course Name: C202-Strength of Material (15CV32)
Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C202.1	1		
C202.2	1		
C202.3	1		
C202.4	1		
Average	**1**		

Course Name: C203- Fluid Mechanics (15CV33)
Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C203.1			
C203.2			
C203.3	1		
C203.4	1		
Average	**1**		

Course Name: C204- Basic Surveying (15CV34)
Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C204.1	1		
C204.2	1		
C204.3	1		
C204.4	1		
Average	**1**		

Course Name: C205- Engineering Geology (15CV35) Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C205.1		2	
C205.2		2	
C205.3		2	
C205.4		2	
Average		**2**	

Course Name: C206- Building Materials And Construction (15CV36) Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C206.1	1		
C206.2	1		
C206.3	1		
C206.4	1		
Average	**1**		

Course Name:C207- Basic Material Testing Laboratory(15CVL37), Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C207.1	1		
C207.2	1		
C207.3	1		
C207.4	1		
Average	**1**		

Course Name:C208- Basic Surveying Practice (15CVL38) Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C208.1			
C208.2			
C208.3			
C208.4			
Average			

Course Name: C209- Engineering Mathematics-IV (17MAT41)
Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C209.1			
C209.2			
C209.3			
C209.4			
C209.5			
Average			

Course Name:C210-Analysis of Determinate Structures (15CV42) Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C210.1	1		
C210.2	1		
C210.3	1		
C210.4	1		
Average	**1**		

Course Name: C211-Applied Hydraulics (15CV43)
Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C211.1			
C211.2			
C211.3			
C211.4			
Average			

Course Name:C212- Concrete Technology (15CV44)
Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C212.1		2	
C212.2		2	
C212.3		2	

Course		PSO2	
C212.4		2	
Average		**2**	

Course Name:C213- Basic Geotechnical Engineering (15CV45) Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C213.1		2	
C213.2		2	
C213.3		2	
C213.4		2	
Average		**2**	

Course Name:C214- Advanced Surveying (15CV46) Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C214.1			
C214.2			
C214.3			
C214.4			
Average			

Course Name:C215- Fluid Mechanics Laboratory (15CVL47) Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C215.1			
C215.2			
C215.3			
C215.4			
Average			

Course Name:C216-Engineering Geology Laboratory (15CVL48) Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C216.1			
C216.2			

Course			
C216.3			
C216.4			
Average			

Course Name:C301- Design of RC Structural Elements (15CV51) Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C301.1	2		
C301.2	2		
C301.3	2		
C301.4	2		
Average	**2**		

Course Name:C302-Analysis of Indeterminate Structures(15CV52) Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C302.1	2		
C302.2	2		
C302.3	2		
C302.4	2		
C302.5	2		
Average	**2**		

Course Name:C303- Applied Geotechnical Engineering (15CV53) Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C303.1		1	
C303.2		1	
C303.3	1	1	

Course		
C303.4	1	1
Average	**1**	**1**

Course Name:C304- Computer Aided Building Planning and Drawing (15CV54) Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C304.1	2		
C304.2	2		
C304.3	2		
C304.4	2		
Average	**2**		

Course Name:C305- Railways, Harbors, Tunnel and Airports (15CV552) Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C305.1			
C305.2			
C305.3			
C305.4			
Average			

Course Name:C306- Traffic Engineering (15CV561) Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C306.1			
C306.2			
C306.3			
C306.4			
Average			

Course Name: C307 -Geotechnical Engineering Laboratory (15CVL57) Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C307.1		2	
C307.2		2	

Course		PSO2	
C307.3		2	
C307.4		2	
Average		**2**	

Course Name: C308 -Concrete and Highway Materials Testing Laboratory (15CVL58) Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C308.1			
C308.2			
C308.3			
C308.4			
Average			

Course Name: C309 -Construction Management and Entrepreneurship (15CV61) Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C309.1			
C309.2			
C309.3			
C309.4			
Average			

Course Name: C310 -Design of Steel Structural Element (15CV62) Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C310.1	2		
C310.2	2		
C310.3	2		
C310.4	2		
Average	**2**		

Course Name: C311 - Highway Engineering (15CV63)
Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C311.1		2	
C311.2		2	
C311.3		2	
C311.4		2	
Average		**2**	

Course Name: C312 -Water Supply and Treatment (15CV64)
Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C312.1			1
C312.2			1
C312.3			1
C312.4			1
Average			**1**

Course Name: C313 - Solid Waste Management (15CV651)
Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C313.1			2
C313.2			1
C313.3			2
C313.4			1
Average			**1.5**

Course Name: C314 -Water Resources Management (15CV661)
Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C314.1			1
C314.2			1
C314.3			1
C314.4			1
Average			**1**

Course Name: C315 -Software Application Laboratory(15CVL67) Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C315.1	2		
C315.2	2		
C315.3	2		
C315.4	2		
Average	**2**		

Course Name: C316- Extensive Survey Project /Camp(15CVP68) Course Year: 2017-18

Course	PSO1	PSO2	PSO3
C316.1			2
C316.2			2
C316.3			2
C316.4			2
Average			**2**

Department of
Mechanical Engineering

Course Outcomes
Academic Year 2017-18

3rd SEM	
Course name:Engineering Mathematics III	
Subject code:15MAT31	
Co Index	**Course outcomes**
At the end of the course completion student will be able to;	
C201.1	Know the use of periodic singnals and Fourier series to analyze circuits and system communication.
C201.2	Explain the general linear system theory for continuous time singnals and digital signal processing using the Fourier Transform and Z-transform.
C201.3	Ability to know various statistical methods, Correlation, Regression analysis and curve fitting and employ numerical methods to solve algebraic and transcedental equations, Interpolation and integration.
C201.4	Gain the knowledge of Green's theorem, Divergence theorem and Stoke's theorem in various applications in the field of electromagnetic and gravitational fields and fluid flow problems and determine the extemals of functions and solve the problems of calculus of variations.

Course name:Materials Science	
Subject code:15ME32	
Co Index	**Course outcomes**
At the end of the course completion student will be able to;	
C202.1	Describe the mechanical properties of metals, their alloys and various modes of failure.
C202.2	Understand the microstructures of ferrous and non-ferrous materials to mechanical properties
C202.3	Explain the processes of heat treatment of various alloys.
C202.4	Understand the properties and potentialities of various materials available and material selection procedures

C202.5	Explain about the composite materials and their processing as well as applications.

Course name:Basic Thermodynamics	
Subject code:15ME33	
Co Index	Course outcomes
At the end of the course completion student will be able to;	
C203.1	Aquire the fundmentals of thermodynamics, zeroth law, temperature scale and concepts of haet and work
C203.2	Apply I and II law of thermodynamics, for thermodynamics systems.
C203.3	Explain the concepts of entropy, reversibilty and exergy.
C203.4	Discuss ideal, real gases and their mixtuers
C203.5	Study the properties of pure substance ,applications and thermodynamic relations

Course name:Mechanics of Materials	
Subject code:15ME34	
Co Index	Course outcomes
At the end of the course completion student will be able to;	
204.1	Understand simple, compound, thermal stresses and strains their relations, Poisson's ratio, Hooke's law, mechanical properties including elastic constants and their relations.
204.2	Determine stresses, strains and deformations in bars with varying circular, rectangular cross-sections subjected to normal and temperature loads and plane stress, principal stress, maximum shear stress and their orientations using analytical method and Mohr's circle.
204.3	Determine the dimensions and Stresses of structural members including beams, bars and rods for different loading conditions using Energy methods and also stress distribution in thick and thin cylinders.
204.4	Draw SFD and BMD for different beams including cantilever beams, simply supported beams and overhanging beams subjected to UDL, UVL, Point loads and couples.
204.5	Determine the dimensions of shafts based on Torsional strength, rigidity and flexibility and also elastic stability of columns using Rankin's and Euler's theory.

Course name:Metal Casting and Welding	
Subject code:15ME35A	
Co Index	Course outcomes
At the end of the course completion student will be able to;	
C205.1	Describe the casting process, preparation of molds, Molding Machines, Core, Gating, Riser system
C205.2	Compare crucible, Electric and Cupola Melting furnace and Casting using metal moulds,
C205.3	Explain Solidification process, Fettling & cleaning of castings and Casting of Non-Ferrous Metals.
C205.4	Describe Metal arc Welding, TIG, MIG, SAW & AHW processes, Resistance spot, seam, butt, projection, friction explosive, Thermit, Laser and EBW processes used in manufacturing..
C205.5	Describe the Metallurgical aspects in Welding and inspection methods for the quality assurance of components made of casting and joining process.

Course name:Computer Aided Machine Drawing	
Subject code:15ME36 A	
Co Index	Course outcomes
At the end of the course completion student will be able to;	
C206.1	Recall the basics of Engineering drawing. Identify different views of a required geometry and construct Sectional views and True shape of the section
C206.2	Demonstrate the knowledge of converting Pictorial view into orthographic views of Simple machine components.
C206.3	Design and draw Thread Forms, Fasteners, Keys, Joints, and Couplings using empirical relations as per ISO standards.
C206.4	Apply limits and tolerances to assemblies and choose appropriate fits for given assemblies.
C206.5	Construct the individual solid model using detailed part drawings to create an assembly and obtain orthographic views including sectional views using CAD 3D Modeling package.

Course name:Materials Testing Lab	
Subject code:15MEL37A	
Co Index	Course outcomes
At the end of the course completion student will be able to;	
C207.1	Able to Prepare metallographic specimen for microstructure analysis and Identify the microstructure of various metal specimens
C207.2	Able to Explain the various heat treatment processes and interpret the variations in hardness properties before and after heat-treatment.
C207.3	Able to Perform the wear test and determine the wear characteristics of ferrous, non-ferrous and composite materials for different parameters.
C207.4	Able to Explain NDT techniques and perform various NDT tests for analyzing defects.
C207.5	Able to Conduct destructive testing experiments on Tensile, compression, Hardness, Bending, Torsion, impact tests to analyze and interpret mechanical properties of the specimens.

Course name:Foundry and Forging Lab	
Subject code:15MEL38A	
Co Index	Course outcomes
At the end of the course completion student will be able to;	
C208.1	Demonstrate various tools involved in foundry and forging lab.
C208.2	Demonstrate various skills in preparation of moulding sand for conducting tensile, shear and compression tests using universal sand testing machine.
C208.3	Demonstrate skills in determining permeability, clay content and grain fineness number of base sands.
C208.4	Demonstrate skills in preparation of mould box using various types of patterns.
C208.5	Demonstrate skills in preparation of forging models involving upsetting, drawing and bending operations.

4th Sem 2017-18
Course name:Engineering Mathematics IV (15MAT41)

Subject code:15MAT41	
Co Index	Course outcomes
At the end of the course completion student will be able to;	
C209.1	Use appropriate single step and multi-step numerical methods to solve first and second order ordinary differential equations arising in flow
C209.2	Explain the idea of analyticity, potential fields residues and poles of complex potentials in field theory and electromagnetic theory.
C209.3	Employ Bessel's functions and Legendre's polynomials for tacking problems arising in continuum mechanics, hydrodynamics and heat
C209.4	Describe random variables and probability distributions using rigorous statistical methods to analyze problems associated with

Course name : Kinematics of Machinery	
Subject code:15ME42	
Co Index	Course outcomes
At the end of the course completion student will be able to;	
C210.1	Definations of mechanisms, kinematics Links, Pairs , Degree of Freedom and illustrate the Mechanism. Inversion of four bar mechanisms.
C210.2	Sketch and solve velocity and acceleration analysis by graphical method , instantaneous centre method and Kleins construction for various
C210.3	Aanalytical methods Velocity and accelerations of four bar mechanisms using complex algebra method. Fraudistains equation.
C210.4	Difnation of gears, gear basics and diravations, Types of gears. Calculation of gearing ratio of various gear trains.Torque calculations in
C210.5	Sketch and solve different cam profile and different Followers with different displacements. Analysis of arc cam with flat faced follower.

Course name:Applied Thermodynamics	
Subject code:15ME43	
Co Index	Course outcomes
At the end of the course completion student will be able to;	
C211.1	Apply Thermodynamic concepts to Gas Power Cycles and Propulsion Systems.
C211.2	Evaluate the Performance of Vapour Power Cycles.
C211.3	Understand the Combustion Thermodynamics of Fules and Testing of IC Engines.
C211.4	Determine performance parameters of Refrigeration and Air-Conditioning systems.
C211.5	Understand the working principle of Reciprocating Compressors and Steam Nozzles.

Course name: Fluid mechanics	
Subject code:15ME44	
Co Index	Course outcomes

	At the end of the course completion student will be able to;
212.1	Understand fluid properties and fluid statics
212.1	Apply the primciples of fluid kinematics and dynamics for the fluid flow problems
212.1	Applications of laminar & turbulent flow principles to pipe flow problems.
212.1	Apply principles of dimenstional analysis and concepts of boundary layer theory
212.1	Intrepret the basic concepts of compressible flow and CFD

Course name:Machine Tools and Operations	
Subject code:15ME45B	
Co Index	Course outcomes
At the end of the course completion student will be able to;	
C213.1	Explain the construction & specification of various machine tools.
C213.2	Describe various machining processes pertaining to relative motions between tool & work piece.
C213.3	Discuss different cutting tool materials, tool nomenclature & surface finish.
C213.4	Apply mechanics of machining process to evaluate machining time.
C213.5	Analyze tool wear mechanisms and equations to enhance tool life and minimize machining cost.

Course name:Mechanical Measurements and Metrology	
Subject code:15ME46B	
Co Index	Course outcomes
At the end of the course completion student will be able to;	
C214.1	Understand the standards of geometrical measurements.
C214.2	interpret the gauges, its design and types of comparators.
C214.3	Describe various parameters of screw thread measurements
C214.4	Explain gear tooth measurements, laser interferometers and Coordinate measuring machines
C214.5	Illustrate generalised measurement systems and measurement of force, torque, pressure, strain and temperature.

Course name:Mechanical Measurements andMetrology Lab	
Subject code:15MEL47B	
Co Index	Course outcomes
At the end of the course completion student will be able to;	

C215.1	To calibrate pressure gauge, thermocouple, LVDT, load cell, micrometer
C215.2	To measure angle using Sine Center/ Sine Bar/ Bevel Protractor, alignment using Autocollimator/ Roller set.
C215.3	To demonstrate measurements using Optical Projector/Tool maker microscope, Optical flats.
C215.4	To measure cutting tool forces using Lathe/Drill tool dynamometer.
C215.5	To measure Screw thread parameters using 2-Wire or 3-Wire method, gear tooth profile using gear tooth venire /Gear tooth micrometer

Course name:Machine Shop	
Subject code:15MEL48B	
Co Index	**Course outcomes**
At the end of the course completion student will be able to;	
C216.1	Perform the machine tools operations (Lathe, Milling & Shaper)
C216.2	Perform gear tooth cutting using milling machine.
C216.3	Understand the formation of cutting tool parameters of single point & Multipoint cutting tools
C216.4	Demonstrate precautions and safety norms followed in Machine Shop.
C216.5	Exhibit interpersonal skills towards working in a team.

5th Sem 2017-18

Course name:Management and Engineering Economics	
Subject code:15MAT51	
Co Index	**Course outcomes**
At the end of the course completion student will be able to;	
C301.1	Understanding the basic concepts of management and development of effective planning process.
C301.2	Illustrate different organizational structures and appraise proper staff selection process as well as directing and controlling.
C301.3	To analyze and apply tactics, strategy, intuition, analysis and types of returns.
C301.4	Analyze the value of an asset using Present worth, Annual worth and Future worth comparisons using cash flow diagrams.
C301.5	Evaluate the cost of a final product and estimate various depreciation values of commodities

Course name:DYNAMICS OF MACHINERY	
Subject code:15ME52	
Co Index	**Course outcomes**
At the end of the course completion student will be able to;	

C302.1	Determine the forces and couples for static and dynamic conditions of four bar and slider crank mechanisms to keep the system in
C302.2	Determine magnitude, angular position of balancing masses under static and dynamic condition of rotating masses in same / different
C302.3	Determine equilibrium speed, sensitiveness, isochronisms, effort and power of porter, Hartnell governors and gyroscopic couple and
C302.4	Understand types of vibration, SHM and methods of finding natural frequencies of simple mechanical undamped free vibration (SDOF)
C302.5	Determine equation of motion, natural frequency, damping factor, logarithmic decrement of damped free vibration (SDOF) systems and

Course name:Turbo machines	
Subject code:15ME53	
Co Index	**Course outcomes**
At the end of the course completion student will be able to;	
C303.1	Understand the basic quantities related to power absorbing and generating machines.
C303.2	Comprehend thermodynamic relations applied to turbo machines.
C303.3	Analyse the performance of steam turbines.
C303.4	Evaluate the work interactions and characterstics of hydraulic turbines.
C303.5	Intrepret the working of pumps and compressors.

Course name:DESIGN OF MACHINE ELEMENTS-I	
Subject code:15ME54	
Co Index	**Course outcomes**
At the end of the course completion student will be able to;	
C304.1	To COMPREHEND the basic procedure of mechanical design process and choose materials.
C304.2	APPLY the codes and standards in design process.
C304.3	DETERMINE the stress and strain for the element subjected to static, impact and fatigue loading.
C304.4	SKETCH and SOLVE power transmitting shafts under combined and fluctuating loads, fasteners and power screws.
C304.5	DESIGN and SKETCH the permanent (riveted joints, welded joints) and detachable joints (cotter & knuckle joints, keys and couplings)

Course name:Human Resource Management	
Subject code:15ME553	
Co Index	**Course outcomes**
At the end of the course completion student will be able to;	
C3053.1	Understand the functions & principles of Human Resource Management and process of Job analysis

C3053.2	Discuss the objectives of Human Resource planning, Recruitment and selection process
C3053.3	Explain the process involved in Placement, Training and development activities
C3053.4	Describe the characteristics of an effective appraisal system and compensation planning.
C3053.5	Summarise the issues related to employee welfare, grievances and discipline

Course name:NTM	
Subject code:15ME554	
Co Index	**Course outcomes**
At the end of the course completion student will be able to;	
C3054.1	Understand the compare traditional and non-traditional machining process and recognize the need for Non-traditional machining process.
C3054.2	Understand the constructional features, performance parameters, process characteristics,applications, advantages and limitations of USM,
C3054.3	Identify the need of Chemical and electro-chemical machining process along with the constructional features, process parameters, process
C3054.4	Understand the constructional feature of the equipment, process parameters, process characteristics, applications, advantages and
C3054.5	Understand the LBM equipment, LBM parameters, and characteristics. EBM equipment and mechanism of metal removal, applications,

Course name:ENERGY and ENVIRONMENT	
Subject code:15ME562	
Co Index	**Course outcomes**
At the end of the course completion student will be able to;	
C3062.1	summarize the basic concepts of energy ,its distribution and general scenario.
C3062.2	explain different energy storage systems,energy management,audit and economic analysis.
C3062.3	summarize the environment ecosystem and its need for awareness.
C3062.4	Identify the various types of environment pollution and their effects.
C3062.5	discuss the social issues of the environment with associated acts.

Course name:FM LAB	
Subject code:15MEL57	
Co Index	**Course outcomes**
At the end of the course completion student will be able to;	
C307.1	Calibrate flow measuring devices.
C307.2	Determine major and minor losses for flow through pipes.

C307.3	Test performance of centrifugal, reciprocating pumps and multistage pumps.
C307.4	Test performance of impact of jet on vanes and hydraulic turbines.
C307.5	Test performance of reciprocating air compressor and centrifugal air blower.

Course name:Energy Conversion Lab	
Subject code:15MEL58	
Co Index	**Course outcomes**
At the end of the course completion student will be able to;	
C308.1	perform experiments to determine the properties of fuels and oils
C308.2	conduct experiments on internal combustion engines and draw characteristics
C308.3	test basic performance parameters of internal combustion engines and implent the knowledge in industry
C308.4	identify exhaust emission,factors affecting them and report the remedies.
C308.5	exhibit his competency towards preventive maintenance of I c engines

6th Sem 2017-18

Course name:FINITE ELEMENT ANALYSIS	
Subject code:15ME61	
Co Index	**Course outcomes**
At the end of the course completion student will be able to;	
C301.1	Understand the concepts behind formulation methods in FEM.
C301.2	Identify the application and characteristics of FEA elements such as bars, beams, plane and iso-parametric elements.
C301.3	Develop element characteristic equation and generate global equation.
C301.4	Apply suitable boundary conditions to a global equation for static and dynamic problems .
C301.5	Evaluate displacements, stress and strains for different mechanical elements.

Course name:Computer Integrated Manufacturing - 15ME62	
Subject code:15ME62	
Co Index	**Course outcomes**
At the end of the course completion student will be able to;	
C310.1	Define Automation, CIM, CAD, CAM and explain the differences between these concepts. Solve simple problems of transformations of
C310.2	Explain the basics of automated manufacturing industries through mathematical models and analyze different types of automated flow

C310.3	Analyze the automated flow lines to reduce down time and enhance productivity.
C310.4	Explain the use of different computer applications in manufacturing, prepare part programs for simple jobs on CNC machine tools and
C310.5	Visualize and appreciate the modern trends in Manufacturing like additive manufacturing, Industry 4.0 and applications of Internet of

Course name:Heat Transfer-15ME63	
Subject code:15ME63	
Co Index	**Course outcomes**
At the end of the course completion student will be able to;	
C311.1	Discus the basic modes of heat transfer and compute steady and unsteady state heat conduction
C311.2	Intrepret heat transfer through extended surfaces and critical thickness of insulation
C311.3	Apply emperical correlations to solve free and forced convection heat transfer
C311.4	Explain the primciples of radiation heat transfer, phenomena of boiling and condenstaion
C311.5	Design of heat exchangers using LMTD and NTU method

Course name:DESIGN OF MACHINE ELEMENTS-II-15ME64	
Subject code:15ME64	
Co Index	**Course outcomes**
At the end of the course completion student will be able to;	
C312.1	Understand and Design various elements involved in a mechanical system involving springs, curved beams, belts, and pulleys. Apply
C312.2	Analyze various forces acting on the elements of a mechanical system and design them using appropriate techniques, codes, and standards.
C312.3	Design and select transmission elements like gears, belts, pulleys, bearings from the manufacturers' catalogue for different applications.
C312.4	Design completely a mechanical system such as brakes and clutches integrating machine elements.
C312.5	Develop assembly and working drawings of various mechanical systems involving machine elements like belts, pulleys, gears, springs,

Course name:Metal Forming -15ME653	
Subject code:15ME653	
Co Index	**Course outcomes**
At the end of the course completion student will be able to;	
C3133.1	Understand the concept of stress, strain & different metal forming process.
C3133.2	Approach forging processes both analytically and numerically
C3133.3	Approach rolling & drawing processes both analytically and numerically

C3133.4	Approach extrusion & sheet metal forming both analytically and numerically
C3133.5	Develop approaches and solutions to analyze HERF & Powder Metallurgy forming processes and the associated problems and flaws.

Course name:Industrial Safety-15ME662	
Subject code:15ME662	
Co Index	Course outcomes
At the end of the course completion student will be able to;	
C3142.1	Understand the various fundamental concepts of Industrial Safety & Regulations.
C3142.2	Recognize the classes of fires, types of Extinguishers used, prevention & protection of fire.
C3142.3	Discuss the purpose of PPE's, safety precautions while working with Machine tools & Material handling.
C3142.4	Identify the effects, hazards, causes of Electric current, types of electric shocks, current shocks, prevention & procedures of Electrical
C3142.5	Explain the fundamentals such as prevention's & precautions of Chemical Safety, safety audit, confined space entry & Risk Management.

Course name:Total Quality Management-15ME663	
Subject code:15ME562	
Co Index	Course outcomes
At the end of the course completion student will be able to;	
C3144.1	Explain the various approaches of TQM
C3144.2	Infer the customer perception of quality
C3144.3	Analyze customer needs and perceptions to design feedback systems
C3144.4	Apply statistical tools for continuous improvement of systems
C3144.5	Apply the tools and technique for effective implementation of TQM

Course name:FM LAB	
Subject code:15MEL57	
Co Index	Course outcomes
At the end of the course completion student will be able to;	
C315.1	Determine thermal conductivity of metal rod and composite wall.
C315.2	Demonstrate and calculate effectiveness of metallic fin, free and forced convection.
C315.3	Illustrate surface emissivity and stefan boltzmann constant of a test plate.
C315.4	Conduct experiment on phase change processes and transient conduction.

C315.5	Analyze LMTD and NTU method of parallel and counterflow heat exchanger.
C315.6	Performance of vapour compression refrigeration and vapor compression air conditioner.

Course name:Modeling and Analysis Lab(FEA)-15MEL68	
Subject code:15MEL68	
Co Index	Course outcomes
At the end of the course completion student will be able to;	
15C316.1	Demonstrate the basic features of an analysis package.
15C316.2	Use the modern tools to formulate the problem, and able to create geometry, descritize, apply boundary condition to solve problems of
15C316.3	Demonstrate the deflection of beams subjected to point, uniformly distributed and varying loads further to use the available results to draw
15C316.4	Analyze the given problem by applying basic principle to solve and demonstrate 1D and 2D heat transfer with conduction and convection
15C316.5	Carry out dynamic analysis and finding natural frequencies for various boundary conditions and also analyze with forcing function.

7th Semester 2017 - 18

Course name:Engineering Economy	
Subject code:10ME71	
Co Index	Course outcomes
C401.1	To analyze and apply tactics, strategy, intuition, analysis and types of returns.
C401.2	Analyze the value of an asset using present worth, annual worth and future worth using revenue and cost dominated cash flows.
C401.3	Evaluate the cost of a final product using various costs involved in the manufacturing of a component and analyze the financial aspects.
C401.4	Demonstrate knowledge on financial ratio analysis and profit planning as well as preparation of budgets.

Course name:Mechanical Vibrations	
Subject code:10ME72	
Co Index	Course outcomes
CO 402.1	COMPRIHEND the cause and effects of vibration, formulating the governing equations of motion of Single-Degree-Freedom Systems.

CO 402.2	DEVELOP schematic models and formulate the governing equations of motion in Two-Degree-Freedom Systems and determine the whirling speed of shaft with different end conditions, apply concept of vibration measuring instruments.
CO 402.3	EXAMINE the role of damping, stiffness and inertia in Multi-Degree-Freedom Systems comparing different methods (Holzer, Stodola, Rayleigh, Dunkerlay)
CO 402.4	ANALYZE and AQUIRE knowledge of machine supporting structures, vibration isolators and absorbs to maintain and monitor the conditions of vibrating systems.

Course name:Hydraulics and Pneumatics	
Subject code:10ME73	
Co Index	**Course outcomes**
CO 403.1	Memorize and Explain basics of hydraulic power, Pascal's law and its applications. Classify and Describe the construction, structure &
CO 403.2	Comprehend Design & Analyze Single& Double Acting Hydraulic Cylinder circuits for various applications and functions of their Control
CO 403.3	Comprehend basics of pneumatic system and its applicaitons. Classify and describe the construction, structure & working Principle of
CO 403.4	Recall the Signal Processing Elements such as OR & AND gates in pneumatic applications. Comprehend Multi cylinder applications,

Course name:Operation Research	
Subject code:10ME74	
Co Index	**Course outcomes**
C404.1	Understand the basic concepts of operations research as well as formulation and solution of linear & integer programming problems.
C404.2	Construct and solve transportation and assignment models.
C404.3	Develop and apply mathematical techniques in network models and sequencing problems.
C404.4	Develop the optimal strategies for queuing and game theory problems for complex engineering activities.

Course name:Total Quality Management	
Subject code:10ME758	
Co Index	**Course outcomes**
C4058.1	Understand the concepts and importance of quality as well as effective leadership to achieve TQM.

C4058.2	Recognize the need for customer satisfaction and demonstrate different techniques of continuous process improvement in the context of
C4058.3	Selection of appropriate quality control techniques and tools to achieve quality.
C4058.4	Develop the quality skills in organizational culture to build excellence using TQM practices for sustainable development.

Course name:Robotics	
Subject code:10ME766	
Co Index	Course outcomes
CO 313.1	Comprehend the importance of integrating mechanical, electrical and electronic systems in order to achieve better performance. Define
CO 313.2	Elucidate various electrical actuators and their applications. Distinguish between electrical and mechanical systems, Explain and discuss
CO 313.3	Summarize the evolution of microprocessor and its concepts. Review the basics of Boolean algebra, logical gates, gate network, binary &
CO 313.4	Comprehend and Describe organization of microprocessor with functions of different components of microprocessor. Explain basic

Course name:Design Laboratory	
Subject code:10MEL77	
Co Index	Course outcomes
C407.1	Understand the phenomena of vibration in various mechanical systems by knowing critical parameters responsible for vibration.
C407.2	Calibrate the given material by using experimental stress analysis and to find the value of stress at a given point.
C407.3	Understand the working principle of different types of governors and determining various governing parameters of the system.
C407.4	Know the principle and application of strain rosettes, strain gauges and to calibrate the given apparatus.
C407.5	Recognize the working principle and to sketch the pressure distribution in journal bearing.
C407.6	Experiment the problem of static and dynamic balancing of rotating masses.

Course name:CIM & Automation Laboratory	
Subject code:10MEL78	
Co Index	Course outcomes
CO408.1	Demonstrate the knowledge by writing the CNC program using G & M codes.
CO408.2	Identify type of machining centre for the geometry given, construct required geometry, machine and simulate machining operations using
CO408.3	Recall the concepts of CIM & Automation; Write program to ASRS to carry out ASRS function on simple components. Write Program to

CO408.4	Design robot cell setup, program the robot to perform pick and place operation, stacking of objects using teach pendent and off line
CO408.5	Demonstrate the knowledge by designing pneumatic, electro pneumatic and hydraulic circuits for different applications using software.

8th Semester 2017-18

Course name:Operation Management

Subject code:10ME81

Co Index	Course outcomes
C409.1	Understand functions of business organizations and factors related to productivity, decision process & linear programming
C409.2	Prediction and analysis of forecasting as well as determination and development of capacity and location decisions.
C409.3	Analysis of aggregate planning, evaluation & design of inventory management to manage projects.
C409.4	Appraise material requirement planning and development of procurement process using SCM techniques.

Course name:Control Engineering

Subject code:10ME82

Co Index	Course outcomes
C410.1	DISCUS and ILLUSTRATE control systems and develop the mathematical model of physical systems, DETERMINING the transfer
C410.2	ILLUSTRATE block diagrams, signal flow graphs, and EXAMINE transient and steady state response of different order systems. And
C410.3	SKETCH and EXAMINE frequency response of various systems using polar, nyquist, bode plots and MN circles.
C410.4	SKETCH and EVALUATE the stability of control system using root locus plots, state variable methods. DISTINGUISH between lag lead

Course name:Organizational Behaviour and Professional Communication

Subject code:10ME835

Co Index	Course outcomes
C4115.1	Understand human behavioral issues in organizations based on individual differences, attitude, interest values & ethics.
C4115.2	Demonstrate knowledge on learning aspects and illustrate factors influencing perception in discharging responsibilities at organization as
C4115.3	Differentiate theories of Motivation and demonstrate factors of group dynamics to work effectively in teams
C4115.4	Understand the impact and management of conflict & stress and to communicate effectively in organizations.

Course name:Automotive Engineering	
Subject code:10ME844	
Co Index	Course outcomes
C4124.1	Distinguish Engine Components, Cooling, Lubrication, fuels and Fuel Supply Systems For SI And CI Engines.
C4124.2	Interpret Superchargers, Turbochargers and Ignition Systems.
C4124.3	Various Power transmitssion systems in Automotives .
C4124.4	Illustrate the Automotive Suspension, Braking and Emission Control Systems.

Course name:Project Work	
Subject code:10ME85	
Co Index	Course outcomes
C413.1	Work in a team to select a problem for project work
C413.2	Review and evaluate the available Literature on the chosen problem
C413.3	Formulate the methodology to solve the identified problem
C413.4	Apply the principles ,tools and techniques & project management cost analysis and value analysis to solve the problem
C413.5	Prepare , demonstrate and present project report

Course name:Seminar	
Subject code:10ME86	
Co Index	Course outcomes
C414.1	Appraise with present technologies and trends in real world
C414.2	Formulate the data and present it in sophisticated manner.
C414.3	Develop communication skills, stage confidence and face spontaneous questionnaires

Department of

Electrical and Electronics Engineering

Course Outcomes

Academic Year 2017-18

Faculty: A.Shivamma
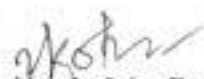
Subject: Engineering Mathematics-III

Subject Code: - 15MAT31

COURSE OUTCOME STATEMENT

C201.1	Know the use of periodic singnals and Fourier series to analyze circuits and system communication.
C201.2	Explain the general linear system theory for continuous time singnals and digital signal processing using the Fourier Transform and Z-transform.
C201.3	Ability to know various statistical methods, Correlation, Regression analysis and curve fitting and employ numerical methods to solve algebraic and transcedental equations, Interpolation and integration.
C201.4	Gain the knowledge of Green's theorem, Divergence theorem and Stoke's theorem in various applications in the field of electromagnetic and gravitational fields and fluid flow problems and determine the extemals of functions and solve the problems of calculus of variations.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO3
C201.1	3	3													
C201.2	2	2													
C201.3	2	2													
C201.4	2	2													
	2.25	2.25													

Head of the Department,
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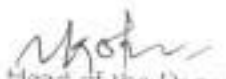(Formerly Vijayanagar Engg. College)
BELLARY-583 104.

Faculty: Dr. U M Netravati

Subject: Electric Circuit Analysis

Subject Code:15EE32

COURSE OUTCOME STATEMENT

	At the end of the course, students will have...
C212.1	Analyze the electrical circuits by various methods
C212.1	Evaluate the transient response of electric circuits
C212.1	Analyze the electrical circuits using Laplace transform.
C212.1	Explain the concepts of resonance and network functions of two port networks

								CO-PO/PSO Mapping								
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	-
C212.1	3	3	3	3									2		
C212.1	3	3	3	3									2		
C212.1	3	3	3	3									2		
C212.1	3	3	3	3									2		
	3	3	3	3									2		

Head of the Department,
Electrical & Electronics Engineering
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BELLARY-583 104.

Faculty: Deepa.B

Subject: Transformers & Generators

Subject Code: - 15EE33

COURSE OUTCOME STATEMENT

	At the end of the course, students will be able to ....
C203.1	demonstrate the construction, operation and performance of single phase and three phase transformers.
C203.2	explain the use of autotransformer, tap changing and tertiary winding transformer of operating transformer in parallel.
C203.3	discuss the armature reaction and commutation and their efficiency in a DC generator.
C203.4	analyse the construction, performance of synchronous machines.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	-
C203.1	3	3		2									2		
C203.2	3	3		2									2		
C203.3	3	2											2		
C203.4	2	3		3									2		
	2.75	2.75		2.33										2	

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Faculty:	vinay kumar Havinal	
Subject:	ANALOG ELECTRONIC CIRCUITS	
Code:	15EE34	**SEM:** 3RD **SEC:** A/
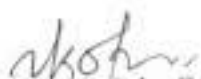
COURSE OUTCOME STATEMENT

At the end of the course, students will be able to ....

C304.1	Recall and Recognize rectifiers, clipping circuits, clamping circuits and Compute various BJT parameters, connections and configurations
C304.2	Describe and Demonstrate BJT Amplifier, Hybrid Equivalent and Hybrid Models
C304.3	Define, Demonstrate and Analyze Power amplifier circuits in different modes of operation and To understand the effect of positive feedback and to analyze and design Oscillators using BJ
C304.4	Recognize the importance of FET and MOSFET

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	•
C304.1	2	2	1	2								1	1	1	
C304.2	3	3	3	3								1	1	1	
C304.3	3	3	3	3								1	1	1	
C304.4	2	2	2	2								1	1	1	
	2.5	2.5	2.25	2.5								1	1	1	

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Faculty: B.Doddabasavanagoud

Subject: Digital system design

Subject Code: - 15EE35

COURSE OUTCOME STATEMENT

At the end of the course, students will be able to ....

C203.1	Define canonical forms, illustrate truth tables with examples, minimization of given logic using Karnaugh Maps, Quine- Mc'lusky Techniques, MEV technique
C203.2	Analysis of : Combinational logiccircuits such as decoders, encoders, multiplexers, adders, subtractors, parallel adders, look ahead carry adders and Binary Comparators
C203.3	Analysis of : Latches , Pulse triggered Flip-flops, Edge triggered flip-flops , Characteristic equations (L4: Analysis)
C203.4	Design of :Latches, registers, asynchronous counters, synchronous counters, sequential circuits, state diagrams, (L6: Design) Explanation of memories (L6: Explanation)

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	-
														2	
C203.1	3	3	2											2	
C203.2	2	3	2											2	
C203.3	3	2												2	
C203.4	3	3	2												
	2.75	2.75	2											2	

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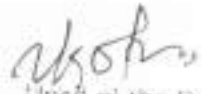(Formerly Vijayanagar Engg. College)
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Faculty:	Dr. Shashidhar SM		
Subject:		Electrical and Electronic Measurements (15EE36)	
Code:	15EE36	SEM: III SEC: A	

COURSE OUTCOME STATEMENT

At the end of the course, students will be able to ....

C206.1	Explain the importance of units and dimensions.
C206.2	Interpret nknown resistance,inductance and capacitance by various methods
C206.3	Discuss the concept of various measuring instruments like power, energy, power factor and frequency
C206.4	Illustrate different electronic instruments and display devices.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2		
C206.1	3	3		2						2		2	2			
C206.2	3	3	2	2						2		2	1			
C206.3	3	3	2	3						2		3	2			
C206.4	3	3	2	3						2		2	3			
	3	3	2	2.5						2		2.25	2			

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Faculty: **Shivamma.A**

Subject: **Engineering Mathematics-IV**

Subject Code: - **15MAT41**

COURSE OUTCOME STATEMENT

C209.1	Use appropriate single step and multi-step numerical methods to solve first and second order ordinary differential equations arising in flow data design problems.
C209.2	Explain the idea of analyticity, potential fields residues and poles of complex potentials in field theory and electromagnetic theory.
C209.3	Employ Bessel's functions and Legendre's polynomials for tacking problems arising in continuum mechanics, hydrodynamics and heat conduction.
C209.4	Describe random variables and probability distributions using rigorous statistical methods to analyze problems associated with optimization and sampling distributions.Apply the k
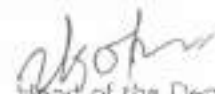
CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO3
C209.1	3	2													
C209.2	2	2													
C209.3	2	2													
C209.4	3	3													

Faculty: ELIA SUNDARAM H M / ZOYA

Subject: Power Generation and Economics

Code: 15EE42   **SEM: IV**   **SEC: A/B**

COURSE OUTCOME STATEMENT

	At the end of the course, students will be able to ....
C210.1	Describe the working of hydroelectric, steam, nuclear power plants and state functions of major equipment of the power plants.
C210.2	Classify various substations and explain the importance of grounding.
C210.3	Understand the economic aspects of power system operation and its effects.
C210.4	Explain the importance of power factor improvement.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	-
C210.1	1	2	2			2		1							
C210.2	2	2	2		2	2	1	1				1		2	
C210.3	2	2	2		2	2	1	1				1		2	
C210.4	2	2	2		2	2	1	1				1		2	
	1.75	2	2		2	2	1	1				1		2	

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Faculty: RAVIKUMAR H M

Subject: TRANSMISSION AND DISTRIBUTION

Code: 15EE43   **SEM: IV**   **SEC: A**

COURSE OUTCOME STATEMENT

At the end of the course, students will be able to ....

C211.1	Understand Various Components of Overhead Transmission Lines and underground cables
C211.2	Analyze the parameters of transmission lines for different configurations
C211.3	Illustrate the Performance of Overhead Transmission Lines and corona effect
C211.4	Discuss the types of distribution systems ,its quality &reliability

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	-
C211.1	3	2	2												
C211.2	3	3	3										2		
C211.3	3	3	3										2		
C211.4	3	1													
	3	2.25	2.6667										2		

Head of the Department,
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Faculty: Girish K.M

Subject: Electric Motors

Code: 15EE44 **SEM: IV** **SEC: A**

COURSE OUTCOME STATEMENT

At the end of the course, students will be able to ....

C212.1	Define the constructional features of Motors and select a suitable drive for specific application.
C212..2	Illustrate different test to be conducted for the assessment of the performance characteristics of motors.
C212.3	Classify the speed control of motor by different methods
C212.4	Explain the construction and operation of Synchronous motor and special motors

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	-
C212.1	3	2								1					
C212..2	3	2								1					
C212.3	3	3								1					
C212.4	3	3								1					
	3	2.5								1					

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Faculty: Dr. S B SHIVA KUMAR / ELIA SUNDARAM H M			
Subject: Electro Magnetic Field Theory			
Code: 15EE45	SEM: IV	SEC: A/B	

COURSE OUTCOME STATEMENT

	At the end of the course, students will be able to ....
C213.1	differentiate types of coordinate systems and use them for solving the problems of EMFT
C213.2	employ static electric fields, their behaviour in different media, associated laws, boundry conditions and electromagnetic potentials.
C213.3	analyse the behaviour of magnetic fields and magnetic materials.
C213.4	analyse time varying fields, propagation of electromagnetic waves in different media.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	-
C213.1	3	3	1												
C213.2	3	3	2												
C213.3	3	3	2												
C213.4	3	3	1												
	3	3	1.5												

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Faculty: B.Doddabasavanagoud/K R PRASAD		
Subject: OPAMP-LIC		
Code: 15EE46	SEM: IV	SEC: A

COURSE OUTCOME STATEMENT

	At the end of the course, students will be able to ....
C214.1	Discuss The Basics Of Linear IC Such As Op-Amp And Its Application and configurations
C214.2	Analyze the working of Active Filters and DC voltage regulators
C214.3	Analyze waveform Generators, Comparators ,Converters and Schmitt Triggereffect of positive feedback and to analyze and design Oscillators using BJT.
C214.4	Analyze Signal processing circuits, A/D, D/A Converters, PLL and Timer

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	
C214.1	3	3	2												
C214.2	2	3	2												
C214.3	3	2													
C214.4	3	3	2												
	2.75	2.75	2												

Head of the Department,
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BELLARY-583 104.

Direct & Indirect Attainment 2019-20	

SUBJEC' Relay and High Voltage LAB   CODE: 15EEL77
STAFF: RAVIKUMAR H M
SEMEST VII

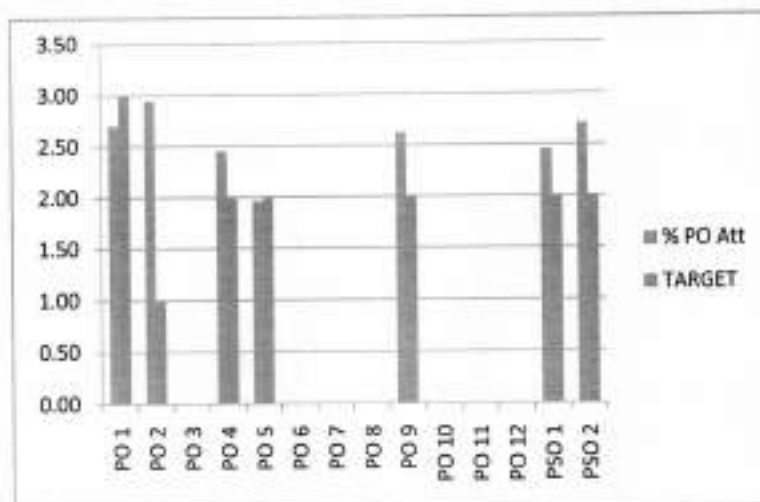| COURSE OUTCOME STATEMENT	
C408.1	Develop a program in MATLAB to assess the performance of medium and long transmission lines.
C408.2	Develop a program in MATLAB to obtain the power angle characteristics of salient and non-salient alternator.
C408.3	Develop a program in MATLAB to assess the transient stability under three phase fault at different
C408.4	Develop programs in MATLAB to formulate bus admittance and bus impedance matrices of interconnected power systems.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C408.1	3	1	3	2		2	2		2	2	2	1		2
C408.2	3	1	3	2		2	2		2	2	2	1		2
C408.3	3	1	3	2		2	2		2	2	2	1		2
C408.4	3	1	3	2		2	1		2	2	2	1		2

	% CO Attainment	CO Attainment Target
C408.1	89.98	60
C408.2	85.89	60
C408.3	93.48	60
C408.4	85.86	60
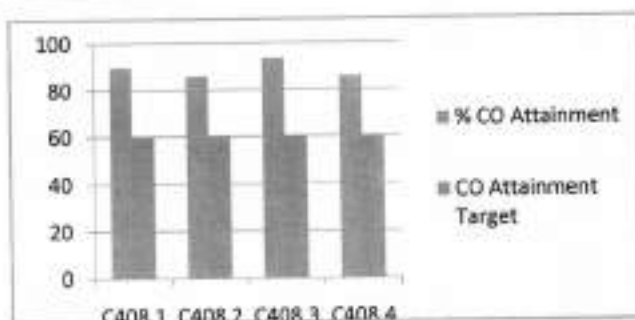
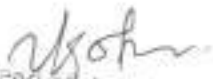| PO's	% PO Att	TARGET
PO 1	2.70	3
PO 2	2.94	1
PO 3		
PO 4	2.45	2
PO 5	1.96	2
PO 6		
PO 7		
PO 8		
PO 9	2.62	2
PO 10		
PO 11		
PO 12		
PSO 1	2.45	2
PSO 2	2.70	2

Faculty: Kotresh S/Shambulingan Goud

Subject: Electrical Machines Lab

Subject Code: 15EEL47

COURSE OUTCOME STATEMENT

	At the end of the course, students will be able to ....
C207.1	test DC machines to determine their characteristics and also to control the speed of DC motor.
C207.2	pre-determine the performance characteristics of DC machines by conducting suitable tests.
C207.3	perform load test on single phase and three phase induction motor to assess its performance.
C207.4	conduct test on induction and synchonous motor to predetermine the performance characteristics

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	-
C207.1	3	1		2		2	2		2	2		1		2	
C207.2	3	1		2		2	2		2	2		1		2	
C207.3	3	1		2		2	2		2	2		1		2	
C207.4	3	1		2		2	1		2	2		1			2
	3	1		2		2	1.75		2	2		1			2

Faculty: K RAGHAVENDRAPRASAD		
Subject: M&E		
Code: 15EE54	SEM: V	SEC: B

COURSE OUTCOME STATEMENT

At the end of the course, students will be able to ....

C301.1	Understand the fundamental concept of management and describe the functions of managers
C301.2	Describe the functions of entrepreneurs and their social responsibilities
C301.3	Compare institutional support by various state and central government agencies
C301.4	Apply concepts of project Management and design various stages of product development process

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	-
C301.1							3	3	3	3	3	3	3	#REF!	#REF!
C301.2							3	3	2	3	2	3	3		
C301.3							1	1	1	2	2	3	2		
C301.4								2	2	2	2	3	3		
							2.3333	2.25	2	2.5	2.25	3	2.75		

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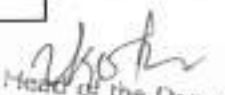BELLARY-583 104.

Faculty: Dr. B Doddabasavana Goud

SUBJECT:MICROCONTROLER

Subject Code: - 15EE52

COURSE OUTCOME STATEMENT

	On successful completion of the course, the students will able to .....
C311.1	ANALYSE SIGNALS USING DISCRET FOURIER TRANSFORM,UNDERSTAND CIRCULAR CONVOLUTION ITS RELATIONSHIP WITH LINEAR CONVOLUTION
C311.2	UNDERSTAND THE DECIMITION IN TIME AND FREQUENCY FFT ALGORITHM FOR EFFIDENT COMPUTATION OF DFT
C311.3	TO UNDERSTAND THE DESIGN OF FIR AND IIR FILTERS WITH DESIRED FREQUENCY RESPONSE
C311.4	TO DESIGN IIR AND DIGITAL FILTER STRUCTURE ,TO UNDERSTAND THE USE OF DSP TOOLS

							CO-PO/PSO Mapping									
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	-
C311.1	3	2	1	2								1	1	1	
C311.2	3	2	1	2								2	1	1	
C311.3	3	2	1	2								2	1	1	
C311.4	3	2	1	2								2	1	1	
	3	2	1	2								1.75	1	1	

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Faculty	Shasidhar R	
Subject	Power Electronics	
Code: 15EE53	**SEM: V**	**SEC: A**

COURSE OUTCOME STATEMENT

At the end of the course, students will be able to ....

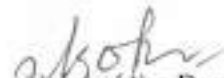|	
C303.1	Give an overview of applications power electronics and types of their operation.
C303.2	Compare different power transistors, their steady state and switching characteristics
C303.3	Analyse the operation of thyristor firing and commutation circuits .
C303.4	Design, analysis techniques, performance parameters and characteristics of Voltage controllers.

CO-PO/PSO Mapping

O Numb	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	0	PSO 1	PSO 2
C303.1	3	2										1	1		
C303.2	3	2	2									1	1		
C303.3	3	2	2									1	1		
C303.4	3	2	1									1	1		
0															
0															
	3	2	1.667									1	1		

Head of the Department,
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	Faculty: Hanumantha reddy
	Subject: signals and systems
	Code: 15EE54 SEM: V SEC: A/B

COURSE OUTCOME STATEMENT

	At the end of the course, students will be able to ....
C304.1	Discuss the continuous time and discrete time signals and systems
C304.2	Apply convolution techniques for determining the output of continuous time and discrete time LTI systems
C304.3	Analyze Fourier transform representation of continuous time and Discrete time non periodic signals and properties of fourier transform
C304.4	Apply Z transforms and properties of Z-transform for analysis of Discrete time system.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	
C304.1	3	2													
C304.2	3	2													
C304.3	3	3													
C304.4	3	3													
	3	2.5													

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Faculty: VINAYA KUMAR H

Subject: ELECTRICAL ENGINEERING MATERIALS

Code: 15EE552   **SEM: V**   **SEC: A**

COURSE OUTCOME STATEMENT

At the end of the course, students will be able to ....

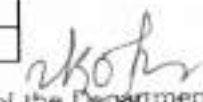|	
C305.1	Discuss electrical and electronics materials, their importance, classification and operational requirement
C305.2	Discuss conducting materials, dielectric materials, insulating materials, magnetic materials used in engineering, their properties and classification.
C305.3	Explain the phenomenon superconductivity, super conducting materials, plastic and their properties and application in engineering.
C305.4	Discuss materials used for Opto electronic devices.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	
C305.1	1	1										1			
C305.2	2	1										1			
C305.3	2	1										1			
C305.4	1	1										1			
	1.5	1										1			

Faculty: Shivakumar			
Subject: RES			
Code: 15EE563	**SEM: V**	**A**	

COURSE OUTCOME STATEMENT

	At the end of the course, students will be able to ....
C306.1	Discuss causes of energy scarcity and its solution, energy from sun, energy reaching the Earth's surface and solar thermal energy
C306.2	Discuss types of solar collectors, their configurations, solar cell system, its characteristics and their applications
C306.3	Discuss generation of energy from hydrogen, wind, geothermal system, solid waste and agriculture refuse, biomass, biogas.
C306.4	Discuss tidal energy resources, sea wave energy and ocean thermal energy and their power generation. ■

CO-PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
C306.1	2	2				1	2	2				2			
C306.2	2	2				1	2	1				1			
C306.3	2	2				1	2	1				2			
C306.4	2	2				1	2	1				1			
	2	2				1	2	1.25				1.5			

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Faculty: Dr. DBG/ALADALLI SHARANABASAPPA/ GAYATRI J/SHIVAKUMAR I

Subject: MICROCONTROLLER LAB

Subject Code: 15EEL57

COURSE OUTCOME STATEMENT

	At the end of the course, students will be able to ...
C307.1	Develop Assembly Language Programs
C307.2	Illustrate Embedded C Programs
C307.3	Interface the 8051 with hardware devices
C307.4	Inspect different waveforms using DAC interface.

CO-PO/PSO Mapping														
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C307.1	3	2	2	1	2	1				3		2		2
C307.2	3	2	3	1	2	1				3		2		2
C307.3	3	1	3	2	3	1			3	3		2		2
C307.4	3	1	3	2	3	1			3	3		2		2

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Faculty: Hanumantha reddy
Subject: CONTROL SYSTEMS
Code: 15EE61   SEM: V   SEC: A

COURSE OUTCOME STATEMENT

	At the end of the course, students will be able to ....
C309.1	Apply mathematical modelling of control systems, block diagram manipulation and signal flow graph methods to obtain transfer function of systems.
C309.2	Determine the transient and steady state time response of simple control systems
C309.3	Analyze the stability of control system using Root locus, Bode plot and Nyquist plot
C309.4	Design controller/compensator for the given specifications

CO-PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
C309.1	3	3		2	2							1			
C309.2	3	2										1			
C309.3	3	3	2	2	1							1			
C309.4	2	3	2	2	2							2			
	2.75	2.75	2	2	1.6667							1.25			

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Subject: POWER SYSTEM ANALYSIS-1			
Code: 15EE62	SEM: VI	SEC: A	

COURSE OUTCOME STATEMENT

	At the end of the course, students will be able to ....
C310.1	To explain the concept of one line diagram and its implementation in problems.
C310.2	To analysis the three phase symmetrical faults on synchronous machine and simple power systems.
C310.3	To analysis of synchronous machine and simple power systems for different unsymmetrical faults using symmetrical components.
C310.4	Discuss stability and types of stability for a power system and the equal area criterion for the evaluation of stability of a simple system.

CO-PO/PSO Mapping

PO Number	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	0	PSO 1	PSO 2
C310.1	3	3		1								1			
C310.2	3	3		2								1			
C310.3	3	3		2								1			
C310.4	3	3		2								1			
	3	3		1.75								1			

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BELLARY-583 104.

Faculty: Dr. B Doddabasavana Gouda

Subject: DIGITAL SIGNAL PROCESSING

Subject Code: - 15EE63

COURSE OUTCOME STATEMENT

	On successful completion of the course, the students will able to ...
C311.1	ANALYSE SIGNALS USING DISCRET FOURIER TRANSFORM,UNDERSTAND CIRCULAR CONVOLUTION ITS RELATIONSHIP WITH LINEAR CONVOLUTION
C311.2	UNDERSTAND THE DECIMITION IN TIME AND FREQUENCY FFT ALGORITHM FOR EFFICIENT COMPUTATION OF DFT
C311.3	TO UNDERSTAND THE DESIGN OF FIR AND BR FILTERS WITH DESIRED FREQUENCY RESPONSE
C311.4	TO DESIGN IIR AND DIGITAL FILTER STRUCTURE ,TO UNDERSTAND THE USE OF DSP TOOLS

							CO-PO/PSO Mapping									
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	-
C311.1	3	2	1	2									1	1	1	
C311.2	3	2	1	2									2	1	1	
C311.3	3	2	1	2									2	1	1	
C311.4	3	2	1	2									2	1	1	
	3	2	1	2									1.75	1	1	

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Faculty: ANUSUYA PATIL

Subject: ELECTRICAL MACHINE DESIGN

Subject Code: 15EE64

COURSE OUTCOME STATEMENT

	At the end of the course students will be able to:
C312.1	Classify & select proper material for the design of an electrical machine
C312.2	Design armature and field systems for D.C machines
C312.3	Creatively apply knowledge to design core, yoke, windings and cooling systems of transformers.
C312.4	Design stator and rotor of induction motors and synchronous motors

CO-PO/PSO Mapping														
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	-
C312.1	2	2	3					2	3				2		
C312.2	3	2	3					2	3				2		
C312.3	3	3	3					2	3				2		
C312.4	3	2	3					2	3				2		
AV	2.75	2.25	3					2	3				2		

Head of the Department
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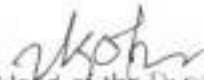
Faculty: Mr LINGANAGOUDA R

Subject: CAED

Subject Code: 15EE651

COURSE OUTCOME STATEMENT

	At the end of the course, students will be able to ....
C305.1	Understand CAD Application package for Electrical Drawing.
C305.2	Develop winding diagrams of Electrical Machines.
C305.3	Understand and Draw Electrical Building Wiring, Panel board wiring, Single line
C305.4	Draw and Realise the Sectional views of AC Machines.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	
															CO-PO/PSO Mapping
C305.1	3	2	1							2					
C305.2	3	3	2	1						2					
C305.3	3	2	3	2	1					2					
C305.4	3	3	3	2	1					2					
	3	2.5	2.25	1.666667	1					2					

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BELLARY-583 104.

Faculty: S.KOTRESH

Subject: SENSORS AND TRANSDUCERS

Code: 15EE662   **SEM: IV**   **SEC: A**

COURSE OUTCOME STATEMENT

At the end of the course, students will be able to ....

C306.1	To discuss need of transducers their classification,advantages and disadvantages
C306.2	Explain the working of different types of transducers and sensors,recent trends in sensor technology and their selections
C306.3	Describe the basics of signal conditioning and its equipments ,configuration of DAS &Data convertions
C306.4	Explain the measurement of various non electrical quantities and data transmission telemetry

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	
C306.1	3	2	2							2			1		
C306.2	3	2	2							2			1		
C306.3	3	3	2							2			1		
C306.4	3	3	2							2			1		
	3	2.5	2							2			1		

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Faculty: **Hanumantha Reddy**
Subject: **Control System Laboratory**
Subject Code: **15EEL67**

COURSE OUTCOME STATEMENT

	At the end of the course, students will be able to ...
C207.1	To determine the time and frequency domain reposes of a given second order system using software package or discrete components
C207.2	To design and analyze Lead, Lag and Lag – Lead compensators for given specifications.
C207.3	To draw the performance characteristics of ac and dc servomotors and synchro-transmitter receiver pair.
C207.4	To simulate the DC position and feedback control system to study the effect of P, PI, PD and PID controller and Lead compensator on the step response of the system.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	-
C207.1	2	2	1		1				1		2	2		2	
C207.2	3	3	3	2	2				2		2	2		2	
C207.3	2	1	2		3				2			2		2	
C207.4	3	3	3	3	3				2			3		2	
	2.5	2.25	2.25	2.5	2.25				1.75		2	2.25		2	

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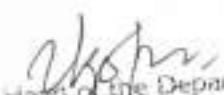
Faculty:	Dr. U M Netravati / Shashidar R
Subject:	Power Electronics Laboratory
Subject Code:	15EEL58

COURSE OUTCOME STATEMENT

	At the end of the course, students will be able to ...
C207.1	Obtain static characteristics of semiconductor devices to discuss their performance.
C207.2	Trigger the SCR by different methods
C207.3	Verify the performance of single phase controlled full wave rectifier and AC voltage controller with R and RL loads.
C207.4	Verify the performance of single phase full bridge inverter connected to resistive load. Control the speed of a DC motor, universal motor and stepper motors.
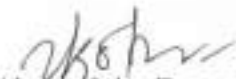
CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	-
													2		
C207.1	3	2	1										2		
C207.2	3	2	1										2		
C207.3	3	2	1										2		
C207.4	3	2	2												

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BELLARY-583 104.

Faculty: GIRISH KM
Subject: Testing and Commissioning of Po⟩Electrical Equipments
Code: 10EE756   SEM: VII   SEC: A

COURSE OUTCOME STATEMENT

At the end of the course, students will be able to ....

C304.1	Describe the process to plan, control and implement commissioning of electrical equipment's.
C304.2	Analyse the performance specifications of transformer and induction motor.
C304.3	Demonstrate the routine tests for synchronous machine, induction motor, transformer & switchgears
C304.4	Explain the operation of an electrical equipment's such as isolators, circuit breakers, induction motor and synchronous machines

CO-PO/PSO Mapping

PO Number	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	B	PSO 1	PSO 2
C304.1	1	2	2			2		1						
C304.2	2	2	2		2	2	1	1				1		2
C304.3	2	2	2		2	2	1	1				1		2
C304.4	2	2	2		2	2	1	1				1		2
	1.75	2	2		2	2	1	1				1		2

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	Faculty: U Shantha Kumar	
	Subject: Electrical Power Utilization	
	Code: 10EE72	**SEM: VII** **SEC: A**

COURSE OUTCOME STATEMENT

	At the end of the course, students will be able to ....
C404.1	Discuss Electric heating, Electric welding, air conditioning and electrolytic process
C404.2	Explain the terminology of illumination, laws of illumination, construction and working of electric lamps, interior and exterior lighting systems
C404.3	Paraphrase systems of electric traction, speed time curves mechanics of train movement and braking System.
C404.4	Recognize the importance of electric and hybrid electric vehicles.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	-
														3	
C404.1	3	2												3	
C404.2	3	3												3	
C404.3	3	3	2											2	
C404.4	3	3													3
	3	3	1												

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Faculty: U Shastha Kumar

Subject: Electrical Power Utilisation

Code: 10EE72   SEM: VII   SEC: A

COURSE OUTCOME STATEMENT

At the end of the course, students will be able to:

C404.1	Discuss electric heating, Electric welding, air conditioning and electrolytic process
C404.2	Explain the terminology of illumination, types of illumination, construction and working of electric lamps, interior and exterior lighting systems
C404.3	Recognize systems of electric traction, speed time curves mechanics of train resistance and braking System
C404.4	Recognize the importance of electric and hybrid electric vehicles

CO-PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C404.1	3	2												
C404.2	3	3												
C404.3	3	3	2											
C404.4	3	3	1											3

Faculty: HANUMANTHA RAO /KUMUDA B
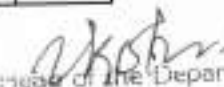
Subject: POWER SYSTEM SIMULATION LAB

Subject Code: 10EEL78   7A/B

COURSE OUTCOME STATEMENT

	At the end of the course, students will be able to ....
C408.1	Develop a program in MATLAB to assess the performance of medium and long transmission lines.
C408.2	Develop a program in MATLAB to obtain the power angle characteristics of salient and non-salient pole alternator.
C408.3	Develop a program in MATLAB to assess the transient stability under three phase fault at different locations in a of radial power systems.
C408.4	Develop programs in MATLAB to formulate bus admittance and bus impedance matrices of interconnected power systems.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	
C408.1	3	3	3	2	2				3				3	3	
C408.2	2	3	3	3	3				2				2	3	
C408.3	3	3	3	3	3				2				3	2	
C408.4	3	3	3	2	2				3				2	3	
	2.75	3	3			FALSE	FALSE		2.5					2.75	

Head of the Department,
Electrical & Electronics Engineering,
R. Y. M. Engineering College,
(Formerly Vijayanagar Engg. College)
BELLARY-583 104.

Faculty: Hanumantha Rao A
Subject: POWER SYSTEM OPERATION & CONTROL
Code: 10EE82   SEM: VIII

COURSE OUTCOME STATEMENT

At the end of the course, students will be able to ....

C410.1	Describe various levels of controls in power systems, architecture and configuration of SCADA.
C410.2	Develop and analyze mathematical models of Automatic Load Frequency Control.
C410.3	Discuss the Control of Voltage , Reactive Power and Voltage collapse.
C410.4	Explain security, contingency analysis, state estimation of power systems

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	—
C410.1	3	2	1		1					1				1	
C410.2	3	2	2		2					1				2	
C410.3	3	2			1					1				2	
C410.4	3	2			1					1				2	
	3	2	1.5		1.25					1				1.75	

Head of the Department,
Electrical & Electronics Engineering,
R. Y. M. Engineering College,
(Formerly Vijayanagar Engg. College)
BELLARY-583 104.

Faculty:KUMUDA

Subject: INDUSTRIAL DRIVES AND APPLICATIONS

Code: 10EE74   **SEM: VIII**   **SEC: B**

COURSE OUTCOME STATEMENT

At the end of the course, students will be able to ....

C410.1	Explain dynamics & different modes of operation of electrical drives.
C410.2	Suggest a motor & electric drive for specified industry and the control of DC motor using controlled rectifiers.
C410.3	Valuate the performance and control of induction motor drives for different conditions.
C410.4	Analyse the control of synchronous motor and stepper motor drives.

CO-PO/PSO Mapping
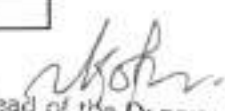
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	-
C410.1	3.	3	2												
C410.2	3	3	2										2		
C410.3	3	3	2										2		
C410.4	3	3	2										2		
	3	3	2										2		

Head of the Department,
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BELLARY-583 104.

Faculty: ANUSUYA PATIL		
Subject: RENEWABLE ENERGY RESOURCES		
Code: 10EE836	SEM: V	SEC: A/B

COURSE OUTCOME STATEMENT

At the end of the course, students will be able to ....

C306.1	Discuss causes of energy starcity and its solution, energy resources and availability of renewable energy
C306.2	Discuss energy from sun, energy reaching the Earth's surface, solar thermal energy and types of solar collectors, their configurations, solar cell system, its characteristics and their applications
C306.3	Discus generation of energy from hydrogen, wind, geothermal system, solid waste, agriculture refuses and production of energy from biomass, biogas.
C306.4	Discuss tidal energy resources, energy availability and power generation.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	
C306.1	1					3	3					2			
C306.2	1					3	3					2			
C306.3	2	1				3	3					1			
C306.4	2	1				3	3					1			
	1.5	1				3	3					1.5			

Head of the Department.
Electrical & Electronics Engineering,
R. Y. M. Engineering College.
(Formerly Vijayanagar Engg. Colle
BELLARY-583 104.

	Faculty: ANUSUYA PATIL
	Subject: RENEWABLE ENERGY RESOURCES
	Code: 10EE836 SEM: V SEC: A/B

	COURSE OUTCOME STATEMENT
	At the end of the course, students will be able to ...
C306.1	Discuss causes of energy scarcity and its solution, energy resources and availability of renewable energy
C306.2	Discuss energy from sun, energy reaching the Earth's surface, solar thermal energy and types of solar collectors, their configurations, solar cell system, its characteristics and their applications
C306.3	Discuss generation of energy from hydrogen, wind, geothermal system, solid waste, agriculture refuse and production of energy from biomass, biogas.
C306.4	Discuss tidal energy resources, energy availability and power generation.

CO-PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
C306.1	1					3	3						2		
C306.2	1					3	3						2		
C306.3	2	1				3	3						1		
C306.4	2	1				3	3						1		
	1.5	1				3	3						1.5		

Faculty: Sri K Raghavendra Rao / Sri Hanumantha Rao A

Subject: SEMINAR

Subject Code: 10EES86			SEC-A&B	
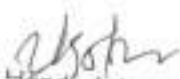
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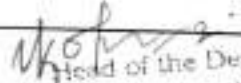
COURSE OUTCOME STATEMENT

	At the end of the course, students will be able to ....
C414.1	Identifying emerging & latest technical seminar topics through Literature Survey in the field of Electrical & Electronics Engineering and engage in independent and lifelong learning.
C414.2	Develop the effective presentation skills through power point & time management.
C414.3	Demonstrate Communication, discussion skills & engage in important questionnaire related to the seminar topic.
C414.4	Develop Documentation design and Report writing skills individually.

CO-PO/PSO Mapping														
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	
C414.1	3	3						3	3	3		3			
C414.2								3	3	3	3	1			
C414.3								3	3	3	3	2			
C414.4								3	3	3	3	2			
Average		3						3	3	3	3	2			

Head of the Department,
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PO Number		Program Outcome Description
PO 1	Engineering Knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem Analysis	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	Design/ Development of Solutions	Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and
PO 4	Conduct investigations of complex problems	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	Modern tool usage	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	The engineer and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	Environment and sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	Individual and team work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make
PO 11	Project management and finance	Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	Life-long learning	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
PSO1		Apply fundamental knowledge to identify ,formulate,design and investigate various problems of electrical and electronic circuits, power electronics and power circuits.
PSO2		Apply modern software tools for design,simulation and analysis of electrical systems to engage in life-long learning and successfully adapt in multidisciplinary emvironments.
-		
-		

Department of

Electronics and communication Engineering

Course Outcomes

Academic Year 2017-18

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: Dr. SUMANGALA B /PRABHAKAR METI	
Course Name: ENGINEERING MATHEMATICS-III	

Course Code: 15MAT31	Sem:	3	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ....
C201.1	Know the use of periodic signals and Fourier series to analyze circuits and system communications.
C201.2	Explain the general linear system theory for continuous time signals and digital processing using the fourier transform and z-transform.
C201.3	Employ appropriate numerical methods to solve algebraic and transcendental equations.
C201.4	Apply Green's theorem,Divergence theorem and Stokes theorem in various applications in the field of electro-magnetic and gravitational fields and fluid flow problems,Determine the externals of functions and solve the simple problems of the calculus of variations.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C201.1	3	3												
C201.2	2	2												
C201.3	2	2												
C201.4	2	2												
AVG	2.25	2.25												

Staff Signature

C.C.

Name of the Staff:	KHAJA MOINUDDIN , VEERA REDDY			
Course Name: ANALOG ELECTRONICS				
Course Code: 15EC32	Sem:	3	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C202.1	Acquire knowledge of Working principles, characteristics and Frequency response BJT and FET, feedback amplifier configurations and Power amplifier classifications
C202.2	Analyze the performance of BJT & FET amplifier, & Power amplifier
C202.3	Interpretation of performance characteristics of transistors amplifiers, frequency Response and Oscillators.
C202.4	Apply the knowledge gained from transistorized circuits, to design amplifiers and Oscillators

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C202.1	3													
C202.2	2	3											2	
C202.3				3							.			
C202.4		2	3										3	
AVG	2.50	2.50	3.00	3.00									2.50	

C.C.

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: A.VINAY, NAGHARAJ GOUDA H				
Course Name: DIGITAL ELECTRONICS				
Course Code: 15EC33	Sem:	3	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C203.1	Acquire knowledge of Combinational Logic. Simplification Techniques using Karnaugh Maps, Quine-McClusky Technique. Decoders, Encoders, Multiplexers, Adders and Subtractors.
C203.2	Analyse and describe Working of Latches, Flip-Flops, Registers, and Counters.
C203.3	Design and Develop Mealy and Moore Models for digital circuits

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C203.1	3		2											
C203.2	2	2	3											
C203.3			2											
AVG	2.50	2.00	2.33										-	

CO	PO	Mapping	Justification
C203.1	PO1	3	Students are able to understand fundamentals of Digital electronics using combinational circuits like encoders, decodrs ,Multiplexers and demultiplexers, adders and Subtractors.
	PO3	2	Students are able to understand and design Combinational circuits .
	PSO1	1	Students are able to develop combinational circuits using QM method.
C203.2	PO1	2	Students are able to understand fundamentals of Digital electronics using sequential circuits like flipflops,shift registers and counters .
	PO2	2	Students are able to formulate equation for flipflops,shift registers and counters.
	PO3	3	Students are able to design modulo n counters to full extent.
	PSO1	1	Students are able to develop combinational circuits using QM method.
C203.3	PO3	2	Students are able to Design and Develop Mealy and Moore Models for digital circuits.
	PSO1	1	Students are able to develop combinational circuits using QM method.

Course Coordinator

Staff Signature

C.C.

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: Mr. SHARANA BASAVARAJ B, Ms. ROHINI HM					
Course Name: Network Analysis					
Course Code: 15EC34	Sem:	3		Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
CO20\$ 1	Recall the fundamental knowledge of networks, KCL, KVL, Star & Delta, Source transformation & Source shifting techniques & apply it for problem solving.
CO20+2	Apply Super position, Reciprocity, Millman's, Thevenin's, Norton's & Maximum Power transfer theorems to various DC & AC Networks.
CO20\$ 3	Solve for Transient behavior and initial conditions of dc and ac networks; apply Laplace Transform to obtain the response of networks for step, ramp and impulse input.
CO20+4	Recall resonance in series and parallel resonant circuits & apply it for problem solving; Analyze two port network parameters (Z, Y, T & h) for electrical circuits.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO20–1	3	3	3										3	
CO20+2	3	3	3										3	
CO20+3	3	3	3										3	
CO20–4	3	2	2										3	
AVG	3.00	3.00	3.00										3.00	

C.C.

Name of the Staff: Mr. M.MD.ZAKIRULLA			
Course Name: ELECTRONICS INSTRUMENTATION			
Course Code: 15EC35	Sem: 3	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C205.1	Define and describe accuracy, precision, resolution, types of errors, statistical and probable error.(L1)
C205.2	Describe and demonstrate basic functional concepts of various analog and digital measuring instruments and microprocessor based instrument.(L3)
C205.3	Discuss and demonstrate functioning and types of oscilloscopes and signal generators, ac and dc bridges.(L3)
C205.4	Recognize and illustrate significance and working of different types of transducers and understand the importance of lifelong learning in the field of electronic instrumentation.(L3)

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C205.1	3	3										2		
C205.2	2	3										3		
C205.3	3	3										3		
C205.4	2	2										2		
AVG	2.50	2.75										2.50		

CO	PO	Mapping	Justification The topics that are discussed in this CO where
C205.1	PO1 S	3	students uses the basics of mathematics, science, & engineering fundamentals to understand, define, describe concept of accuracy, precision ,resolution, errors & types of errors
	PO2 S	3	students uses the first principles of mathematics, natural sciences & engineering fundamentals to understand, define, describe and analyze concept of accuracy, precision ,resolution, errors & types of errors
	PO12 M	2	Students also recognize need, prepare and engage in broadest contest of technological change.

C.C.

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: Mr. Sudarshan Banakar, Mr N Srikanth					
Course Name: Engineering Electromagnetics					
Course Code: 15EC36	Sem:	3	Year		2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ....
C206.1	Acquire knowledge and solve problems related to Basic Concepts of Electric Fields and analyze Different Charge and Current Configurations to derive Electromagnetic Field Equations.
C206.2	Analyze and formulate the concept of Gradient, Divergence, energy, potential and conductors.
C206.3	Develop the skills to analyze boundary problems using Poisson's & Laplace's equations and steady magnetic fields.
C206.4	Understand basic concepts of magnetic materials and analyze time varying fields, Maxwell equations and uniform plane wave.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C206.1	3	2											3	
C206.2	3	2											2	
C206.3	3	2	1										1	
C206.4	3	2	1										1	
AVG	3.00	2.00	1.00										1.75	

Justification

CO	PO	Mapping	Justification
C206.1	PO1	3	Students use basic knowledge of mathematics and science(physics) to understand the electric field and its equations.
	PO2	2	Students use fundamentals of electromagnetic to solve problems related to electric fields.
	PSO1	3	Students get practical exposure by testing the electric circuits in the AE laboratory.
C206.2	PO1	3	Students use fundamentals to understand concepts of conductors, energy and potential
	PO2	2	Students use fundamentals of physics and mathematics to formulate electric field equations using gradient and divergence useful to solve problems.
	PSO1	2	Students get practical exposure by testing the electric circuits in the AE laboratory.

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: Phanindra Reddy K, Veera Reddy, Srikanth N, Vani H				
Course Name: AE LAB				
Course Code: 15ECL37	Sem:	3	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C207.1	Design and test rectifiers, clipping circuits ,clamping circuits and voltage regulator
C207.2	Compute the parameters from the characteristics of JFET & MOSFET devices
C207.3	Design, test and evaluate BJT Amplifiers in CE Configuration &J FET/MOSFET Amplifiers Amplifiers
C 207.4	Design and test power amplifier & various types of oscillators

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C207.1	2		2										2	
C207.2	2													
C207.3	2	2	2										3	
C 207.4	2	3	3										3	
AVG	2.0	2.50	2.33										2.67	

CO	PO	Mapping	Justification
C207.1	PO1	2	CO1 is mapped to PO1 because knowledge of electronics circuit such rectifiers, clipping circuits, clamping circuits, Voltage Regulato techniques are widely used in finding solution of electronic engineerii problems.
	PO3	2	CO1 is mapped to PO3 As we are going to design various component lil rectifiers, clipping circuits, clamping circuits, Voltage Regulator circui whose concept are helpful in the field of electronics.
	PSO1	3	CO1 is mapped to PSO1 Because as we Design rectifiers, clipping circuit clamping circuits, Voltage Regulators circuits & Testing the circuit.
C207.2	PO1	2	CO2 is mapped to PO1 As the knowledge of engineering fundamentals a required to analyse the characteristics of JFET and MOSFET devices.

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: Vinay A, Sharana Basavaraj B, Manjunath K M

Course Name: DIGITAL ELECTRONICS LAB

Course Code: 15ECL38	Sem:	3	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C208.1	Demonstrate the truth table of various expressions and combinational circuits using logic gates.
C208.2	Design, test and evaluate various combinational circuits such as adders, subtractors, comparators, multiplexers and demultiplexers.
C208.3	Construct flips-flops, counters and shift registers.
C208.4	Design & Simulate full adder and up/down counters.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C208.1	3													
C208.2	2			3									2	
C208.3				3										
C208.4			2		3								3	
AVG	2.50		2.00	3.00	3.00								2.50	

CO	PO	Mapping	Justification
C208.1	PO1	3	Students use fundamentals of Digital electronics verify SOP, POS, De-Morgan's theorem using truth table
C208.2	PO1	2	Students use fundamentals to write truth table & simplify equations of various combinational circuits .
	PO4	3	Students use knowledge of kmap and other techniques to design various combinational circuits.
	PSO1	2	Students use knowledge of theory to design & test practical combinational circuits of various concepts.
C208.3	PO4	3	Students use knowledge of flip flops to design & test practical sequential circuits of various concepts.
C208.4	PO3	2	Students use fundamentals to design adder & counters used for simulating.
	PO5	3	Students are able to Design & simulate circuits using simulation tool.
	PSO1	3	Students get practical exposure by designing & testing the circuits using simulation tool.

Staff Signature

Course Coordinator

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: Dr. SUMANGALA B / AMBIKA					
Course Name: ENGINEERING MATHEMATICS-III					
Course Code: 15MAT41	Sem:	4	Year		2017-18

COURSE OUTCOME STATEMENTS	
	At the end of the course, students will be able to ….
C209.1	Use appropriate single step and multi-step numerical methods to solve first and second order ordinary differential equations arising in flow data design problems.
C209.2	Explain the idea of analyticity, potential fields residues and poles of complex potentials in field theory and electromagnetic theory.
C209.3	Employ Bessel's functions and Legendre's polynomials for tacking problems arising in continuum mechanics, hydrodynamics and heat conduction.
C209.4	Describe random variables and probability distributions using rigorous statistical methods to analyze problems associated with optimization and sampling distributions. Apply the knowledge of joint probability distributions and Markov chains in attempting engineering problems for feasible random events.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C209.1	3	2												
C209.2	2	2												
C209.3	2	2												
C209.4	3	3												
AVG	2.50	2.25												

C.C.

Staff Signature

Name of the Staff: Mrs. CHINNA V GOWDAR, Mr. SHRIDHAR S BILAGI				
Course Name: Microprocessors				
Course Code: 15EC42	Sem:	4	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C210.1	Explain the History of evaluation of Microprocessors, Architecture of 8086, 8088, 8087, CISC & RISC, Von-Neumann & Harvard CPU architecture and Write 8086 Assembly level programs using the 8086 instruction set
C210.2	Write modular programs using procedures and macros and Write 8086 Stack and Interrupts programming
C210.3	Interface 8086 to Static memory chips and 8255, 8254, 0808 ADC, 0800 DAC, Keyboard, Display and Stepper motors
C210.4	Use INT 21 DOS interrupt function calls to handle Keyboard and Display

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O 1	PS O 2
C210.1	3	2	2											2
C210.2	3	2	2											2
C210.3	2	3	2											2
C210.4	2	2	2											3
AVG	2.50	2.80	2.80											2.60

Name of the Staff: SUVARNA S PATIL, A.VINAY				

Course Name: Control Systems					

Course Code: 15EC43	Sem:	4	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C211.1	Develop the mathematical model of mechanical and electrical systems Understand time domain specifications for first and second order systems.
C211.2	Determine the stability of a system in the time domain using Route Harvitz criteria and root locus technique.
C211.3	Determine the stability of a system in the frequency domain using Nyquist and bode plots.
C211.4	Develop a control system in continuous and discrete time using state variable techniques.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C211.1	3	2	3											
C211.2	3	3												
C211.3	3	2												
C211.4	3	2	1											
AVG	3.00	2.25	2.00											

CO	PO	Mapping	Justification
C211.1	PO1	3	Write Differential equations to obtain Force-Voltage & Force-current analogous electrical networks.
	PO2	2	Solve for error coefficients for different types of inputs.
	PO3	3	Determine rise time, fall time, peak over shoot, delay time, settling time for given specifications.
C211.2	PO1	3	Solve for stability by using Routh's Criterion.
	PO2	3	Design Closed loop system for a given transfer funcion by using root locus technique
C211.3	PO1	3	Understanding the concept of Gain & phase margin.
	PO2	2	Calculate transfer function for a given Bode plot.& relative stability using Nyquist criterion
C211.4	PO1	3	Solve to obtain the A, B, C & D state matrices for given electrical network.
	PO2	2	Develop a Model of control system in continuous and discrete time using state variable techniques.
	PO3	1	Determine a control system in continuous and discrete time using state variable techniques.

Course Coordinator

Staff Signature

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DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff:Mr.Santosh Mugali/ Mr. Manjunath K .M					
Course Name: Signals and Systems					
Course Code: 15EC44	Sem:	4	Year	2017-18	

COURSE OUTCOME STATEMENTS	
C212.1	Define signal & system, Classify & operate various signals & systems.
C212.2	Analyze various LTI Systems using various tools like convolution, Difference and Differential Equations and Block Diagram representations.
C212.3	Analyze the Discrete and Continuous Time Systems using Fourier tools for various applications.
C212.4	Apply the knowledge of Z transforms & its properties for analysis of LTI systems.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C212.1	3	2												2
C212.2	3	3	2											2
C212.3	3	3											2	
C212.4	3	2	2										2	
	3	2.5	2										2.00	2.00

CO	PO	JUSTIFICATION
C212.1	1	Mapped with a value of 3 because it requires knowledge of mathematics ,science and the techniques are useful in solving complex engineering problems
	2	Mapped with a value of 2 because it is applicable in natural science and engineering sciences
C212.2	1	Mapped with a value of 3 because it requires knowledge of mathematics ,science and the techniques are useful in solving complex engineering problems
	2	Mapped with a value of 3 because it is applicable in natural science and engineering sciences as well as in reasarch field and advanced technologies
	3	Mapped with a value of 2 because helps in designing of complex system and understand its process
C212.3	1	Mapped with a value of 3 because it requires knowledge of mathematics ,science and the techniques are useful in solving complex engineering problems .
	2	Mapped with a value of 3 because it is applicable in natural science and engineering sciences as well as in reasarch field and advanced technologies .
C212.4	1	Mapped with a value of 3 because it requires knowledge of mathematics ,science and the

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Name of the Staff: Khaja Moinuddin, Sudharshan Banakar	

Course Name: Principles of Communication Systems				
Course Code: 15EC45	Sem:	4	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C213.1	Determine the performance of analog modulation schemes in time and frequency domains and systems for generation and detection of modulated analog signals.
C213.2	Characterize analog signals in time domain as random processes and in frequency domain using Fourier transforms.
C213.3	Characterize the influence of channel on analog modulated signals &determine the performance of analog communication systems.
C213.4	Understand the characteristics of pulse amplitude modulation, pulse position modulation and pulse code modulation systems.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C213.1	3	3	2										1	
C213.2	2	2											1	
C213.3	2	2											1	
C213.4	2	2											1	
AVG	2.25	2.25	2.00										1.00	

CO	PO	Mapping	Justification
C213.1	PO1	3	Students are able to understand performance of fundamentals of analog modulation schemes in time and frequency domains hence mapped to 3
	PO2	3	Students are able to formulate, analyze analog modulation schemes in time and frequency domains hence mapped to 3
	PO3	2	Students are able to design analog modulation schemes and detection of analog schemes hence mapped to 2
	PSO1	1	Students are able to test design electronics circuits using detection circuits moderately ,so mapped to 1
C213.2	PO1	2	Students are able to understand fundamental characteristics of analog signals using fourier transforms and random process hence mapped to 2
	PO2	2	Students are able to formulate, analyze analog modulation schemes of random process using mean covariance and autocorrelation functions hence mapped to 2

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Name of the Staff: Mr N Srikanth, Mr. Dalal Shivkumar					
Course Name: LINEAR INTEGRATED CIRCUITS					
Course Code: 15EC46	Sem:	4	Year		2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C214.1	Acquire the knowledge of op-amp to solve problems related to its characteristics and linear applications.
C214.2	Analyze the performance of Op-amp and its non- linear applications.
C214.3	Discuss and design various Active filters & different types of voltage regulators.
C214.4	Analyze the operations of PLL, 555 timer and its applications, DAC & ADC convertors.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C214.1	2	2	3											
C214.2		3	2											
C214.3	2	2	3											
C214.4	1	2	2											
AVG	1.67	2.25	2.50											

CO	PO	Mapping	Justification
C214.1	PO1	2	To explain various applications of op-amp using DC & AC amplifiers students need to make use of basic circuit fundamentals.
	PO2	2	Students will use knowledge of circuit analysis to formulate different amplifiers useful for solving engineering problems.
	PO3	3	Students will use knowledge of circuit analysis to design various applications of DC & AC circuits using Op-amp.
C214.2	PO2	3	Students will use knowledge of circuit analysis to formulate different non-linear Op-amp circuits useful for solving engineering problems.
	PO3	2	Students will be able to use basic engineering fundamentals to design various linear & non-linear applications of Op-Amp.
C214.3	PO1	2	To explain various operations of filters & regulators students need to make use of basic engineering fundamentals.
	PO2	2	Students will use knowledge of circuit analysis to formulate the characteristics of the filters.
	PO3	3	Students will use knowledge of circuit analysis to design solutions for the engineering problems on filters.
C213.4	PO1	1	To explain various non linear applications of op-amp using timer, ADC, DAC etc students need to make use of basic circuit and IC fundamentals.
	PO2	2	Students will use knowledge of circuit analysis to formulate the modes of the timer and techniques of converters.
	PO3	2	Students will use knowledge of circuit analysis to design solutions for the engineering problems on 555 timers.

Course Coordinator

C.C.

Staff Signature

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Name of the Staff: Mrs. Chinna V Gowdar /Mr. Sridhar Bilagi/Mr. Md. Zakirula/Vani H					
Course Name: Microprocessor Lab					
Course Code: 15ECL47	Sem:	4	Year		2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C215.1	Program a microprocessor to perform arithmetic, logical and data transfer applications.
C215.2	Understand assembler directives, DOS Interrupts, branch and loop operations.
C215.3	Interface a microprocessor to various devices for simple applications.
C215.4	Effectively utilize microprocessor peripherals, procedures and macros for modular programming

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C215.1	3	2	3											2
C215.2	2	2	3											2
C215.3	3	3	3											2
C215.4	2	2	3											2
AVG	2.50	2.25	3.00											2.00

CO	PO	Mapping	Justification
C215.1	PO1	3	Knowledge of engineering fundamental helps to Memorize logic and write programs using instructions.
	PO2	2	Students use different Logic & instructions to analyze and find solution for problem statement.
	PO3	3	Writing programs using data transfer, arithmetic, Boolean & logical instructions which help to design & develop problem statement.
	PSO2	2	Knowledge of assembly program helps the students to develop and program simple embedded system.
C215.2	PO1	2	Knowledge of engineering fundamental helps to Recall logic for code branch and loop construct
	PO2	2	Students uses knowledge of assembler directives, branch and loop construct to analyze and find solution for problem statement
	PO3	3	Implementation of branch and loop construct through the assembly language programs are used for design & develop problem statement.
	PSO2	2	Knowledge of branch and loop construct helps the students to solving problem& develops simple Code conversion.
C215.3	PO1	3	Knowledge of engineering fundamental helps to learn about stepper motor, Elevator, DAC

Name of the Staff: Sudharshan Banakar / Dalal Shivakumar / Khaja Moinuddin/ N Srikanth					
Course Name: LIC+Communication Lab					
Course Code: 15ECL48	Sem:	4		Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C216.1	Design the Filters (LPF, HPF), DAC, Adders, Differentiator and Integrator for the given specifications.
C216.2	Demonstrate the Pulse Sampling, Flat Top Sampling, Balance modulators and Frequency Synthesis using PLL.
C216.3	Analyze Multivibrators, Oscillators for the given specifications.
C216.4	Experiment Analog systems for AM, FM and Mixer.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C216.1	3	3	3	2									3	
C216.2	3	3	2	2									2	
C216.3	3	3	3	2									3	
C216.4	3	3	2	2									2	
AVG	3	3	2.5	2									2.5	

CO-PO Justification

CO	PO	Mapping	Justification
C216.1	PO1	3	As fundamentals of mathematics, modern physics is analyzed it is mapped to 3
	PO2	3	Problem analysis can be done in all circuits before designing it it given 3
	PO3	3	Designing of filters low pass ,high pass and DAC hence mapped to 3
	PO4	2	Investigations carried out few integrators and differentior circuits it are mapped to 2.
	PSO1	3	Analyzed various circuit design and implementation for filters, integrators, differentiators it is mapped to 3
C216.2	PO1	3	Sampling involves basic science and mathematics it is mapped to 3
	PO2	3	Sampling requies to identify problem and solution hence it is mapped to 3
	PO3	2	Designing of sampling,PLL hence mapped to 3
	PO4	2	Conducting complex investigation using balance modulators, PLL hence it is mapped to 2
	PSO1	2	Analyzed various circuit design and implementation for sampling,balance modulators PLL it is mapped to 3

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Name of the Staff: Mr. Dalal Shivakumar/ Ms. Ashiwini				
Course Name: MANAGEMENT & ENTREPRENEURSHIP				
Course Code: 15AL51	Sem:	5	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ....
C301.1	Apply the knowledge of management and planning (L3)
C301.2	Relate and employ the process of organizing, Staffing, Directing and Controlling. (L1 &L3)
C301.3	Identify the business opportunities to extend the concept of Entrepreneurship in Small Scale Industries. (L2, L5)
C301.4	Recognize the various financial institution support towards SSI and developing the project Report for the development of SSI.(L1,L2)

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C301.1								2	2	2	2	2		
C301.2								2	2	2	3	2		
C301.3								1	2	2	3	2		
C301.4								1	2	2	3	2		
AVG								1.50	2.00	2.00	2.75	2.00		

CO	PO	Mapping	Justification
C301.1	PO8	2	Apply ethical principles and commit to professional ethics and responsibilities in planning and management.
	PO9	2	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings in management and planning
	PO10	2	Communicate effectively with society at large, such as, being able to comprehend and write effective reports and design in planning and management
	PO11	2	Demonstrate knowledge and understanding of the engineering and management principles, as a member and leader in a team, to manage projects and in multidisciplinary environments of planning and management.
	PO12	2	Recognize Independent and life-long learning in the broadest context of technological change of planning and management.
C301.2	PO8	2	Apply ethical principles and commit to professional ethics and responsibilities inorganizing, Staffing, Directing and Controlling.
	PO9	2	Function effectively as an individual, and as a member or leader in

C.C.

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DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: SURENDRANATH H, MANJUNATH K M	

Course Name: DIGITAL SIGNAL PROCESSING					
Course Code: 15EC52	Sem:	5	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ....
CO302.1	Compute DFT using definition of dft and its properties.
CO302.2	Examine the use of DFT in linear filtering and to apply the fast fourier transform algorithm to reduce the computation time of dft.
CO302.3	Design FIR filters for the given specification and realize FIR filters with various structures.
CO302.4	Design the analog and digital IIR filters; use the knowledge of filters for realising IIR filters with various structures.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO302.1	3	3	2	2	3									
CO302.2	3	3	2	2	3									
CO302.3	3	3	3	3	3									
CO302.4	3	3	3	3	3									
AVG	3.00	3.00	2.50	2.50	3.00									

CO	PO	Mapping	Justification
CO302.1	PO1	3	Students use the knowledge of mathematics to the solution of complex engineering problems of DFT using definition and its properties.
	PO2	3	Student identify and analyze complex engineering problems of DFT using definition and its properties
	PO3	2	Student design, develop solutions of complex engineering problems of DFT using definition and its properties
	PO4	2	Students conduct investigations of complex problems of DFT using definition and its properties
	PO5	3	Students apply through modern tool usage of DFT using definition and its properties.
CO302.2	PO1	3	Students uses the knowledge of mathematics to evaluate the use of DFT in linear filtering to apply the FFT algorithm to reduce the computation of time of DFT
	PO2	3	Student identify and analyze complex engineering problems to

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DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: Dr. SAVITA SONOLI / Mrs. CHINNA V GOWDAR				
Course Name: Verilog HDL				
Course Code: 15EC53	Sem:	5	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ....
C303.1	Demonstrate Digital Circuit Design using Verilog programming by understanding different operators & data-types [L3].
C303.2	Model Digital Logic Circuit using different programming styles (data-flow, behavioral& structural) .[L4]
C303.3	Describe the art of mixing different types of descriptions, subroutines.[L4]
C303.4	Express the importance of programming by mixing both VHDL & Verilog and synthesis & mapping process.[L2]

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C303.1	3	2												2
C303.2	2	3	3											2
C303.3	3	2	2											3
C303.4	2	2	2											2
AVG	2.50	2.25	2.33											2.25

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DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: ANITHA A, A.VINAY			
Course Name: Information theory & Coding(ITC)			
Course Code: 15EC54	Sem: 5	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
CO304.1	Apply fundamental knowledge of informationb theory for entropy calculation for independent & depedent Sources
CO304.2	Identify and correct the error at the receiver side
CO304.3	illustrate coding and decoding block codes cyclic codes and convolutional encoder & Compute Souirce efficiency by different types of source coding
CO304.4	Demonstrate the fundamental limits of channel capacity for different types of channels and mutal informations.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO304.1	3	3	2										3	
CO304.2	3	3	3										3	
CO304.3	3	3											3	
CO304.4	3	3											2	
AVG	3.00	3.00	2.50										2.75	

C.C.

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Name of the Staff: PHANINDRA REDDY K, ROHINI H M				
Course Name: Operating Systems				
Course Code: 15EC553	Sem:	5	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ....
C305.1	Apply the basic fundamental knowledge of operating systems.
C305.2	Explain Process management, scheduling.
C305.3	Explain Memory management, file system concept.
C305.4	Apply knowledge of message passing & Deadlock.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2
C305.1	2	1	2											
C305.2	2		2											
C305.3	2	2	3											
C305.4	1		2											
AVG	1.75	1.50	2.25											

CO	PO	Mapping	Justification
C305.1	PO1	2	Fundamental knowledge of operating systems are the part of engineering fundamentals.
	PO2	1	Fundamental knowledge of operating systems are used to design system component that meets the specified needs.
	PO3	2	Fundamental knowledge of operating systems is helpful to design solution for complex engineering problems.
C305.2	PO1	2	Structure of Operating Systems is part of engineering fundamentals.
	PO2	2	Because structure of Operating Systems is necessary in the design solution for complex engineering problems.
C305.3	PO1	2	Process management, Memory management, virtual machines, scheduling & file system concepts are part of engineering

Name of the Staff: Phanindra Reddy K				
Course Name: OOPs With C++				
Course Code: 15EC562	Sem:	5	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ....
C306.1	Illustrate the basic fundamental knowledge of Programming in C++.
C306.2	Develop solutions to real world problems using Classes, Objects and functions.
C306.3	Design the operators to work with User Defined data types.
C306.4	Use concepts like Polymorphism, Inheritance for code reusability in Application programs and also perform operations on files.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C306.1	3	3	1											3
C306.2	3	3	3											3
C306.3	3	3	3											3
C306.4	3	3	3											3
AVG	3.00	3.00	2.50											3.00

CO	PO	Mapping	Justification
C306.1	PO1	3	The students will be able to acquire and use the basic fundamental knowledge of Programming in C++, viz Datatypes, Loop controls, pointers, functions, which is a prerequisite for any given programming language.
	PO2	3	The students will be able to review, analyze problems in a systematic manner with the gained knowledge.
	PO3	1	The students will be able to design, develop software solutions for the real world complex problems in the areas of human health, human & machine safety & security, and also for the environment sustainment.
	PSO2	3	The students will be able develop and apply the OOPs with C++ programming concepts and problem solving skills in the field of embedded system.
C306.2	PO1	3	The students will be able to acquire and use the basic fundamental knowledge of Programming in C++, viz Datatypes, Loop controls, pointers, functions, which is a prerequisite for any given programming language.
	PO2	3	The students will be able to review, analyze problems in a systematic manner with the gained knowledge.
	PO3	3	The students will be able to apply the developed software solutions for the real world complex problems in the areas of human health, human & machine safety & security, and also for the environment sustainment.

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Name of the Staff: SHRIDHAR S BILAGI					
Course Name: Microcontroller					
Course Code: 15EC563	Sem:	5	Year	2017-18	

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ....
C306.∫.1	Explain the difference between microprocessors & microcontrollers, architecture of 8051 MC, interfacing of 8051 to external memory, instructions set of 8051 interrupt system, operation of timers/counters and serial port of 8051.
C306.∫.2	Write 8051 ALP using instructions & also generate timings & waveforms using 8051 timers to send & receive serial data using 8051 serial port & to generate an external interrupt using switch.
C306.∫.3	Write 8051 C program to generate square wave on 8051 I/O port pin using interrupt and to send & receive serial data using 8051 serial port.
C306.∫.4	Interface simple switches, LEDs, ADC, LCD & stepper motor to 8051 via 8051 I/O ports.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C306.∫.1	2		2											
C306.∫.2	2	2	2											2
C306.∫.3	2		2											2
C306.∫.4			2	2									2	2
AVG	2.00	2.00	2.00	2.00									2.00	2.00

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Name of the Staff: Mr. Manjunath K M / Mrs. Suvarna Patil, Mr. Santosh M / Mrs. Aswini G			
Course Name: DSP lab			
Course Code: 15ECL57	Sem: 5	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C307.1	Plot the discrete time signals, convolutions and its relations.
C307.2	Understand and analyze the impulse response, difference equations and DFT computations of the given system.
C307.3	Able to design the filters.
C307.4	Interpretation of TMS320C6713 Processor with DSP Applications.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C307.1	3	3												3
C307.2	3	3	2											3
C307.3	3	2	3											3
C307.4	3	3	3											2
AVG	3.00	2.75	2.67											2.75

CO	PO	Mapping	Justification
C 307.1	PO1	3	Mapped with a value of 3 because it requires knowledge of mathematics ,science and the techniques are useful in solving complex engineering problems
	PO2	3	Mapped with a value of 3 because it requires knowledge of mathematics ,science and the techniques are useful in solving complex engineering problems
	PSO2	3	Mapped with a value of 3 because helps in designing of complex system and understand its process
C 307.2	PO1	3	Mapped with a value of 3 because it requires knowledge of mathematics ,science and the techniques are useful in solving complex engineering problems
	PO2	3	Mapped with a value of 3 because it requires knowledge of mathematics ,science and the techniques are useful in solving complex engineering problem
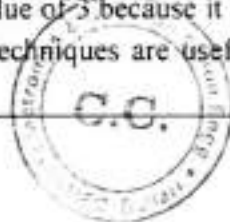
Name of the Staff: Mrs. CHINNA V GOWDAR, Mr. SUDHARSHAN B/Mr. PRASHANTH KENI			
Course Name: HDL lab			
Course Code: 15EC58	Sem:	5	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ....
C 368.1	Write the Verilog/VHDL programs to simulate Combinational circuits in Dataflow, Behavioral and Gate level
C368.2	Describe sequential circuits like flip flops and counters in Behavioral description and obtain simulation waveforms.
C368.3	Synthesize Combinational and Sequential circuits on programmable ICs and test the hardware.
C368.4	Write VHDLInterface the hardware to the programmable chips and obtain the required output

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O 1	PS O 2
C368.1	3	2	2		3									2
C368.2	3	2	2		2									2
C368.3	3	3	3		2									3
C368.4	1	2	2		2									2
AVG	2.33	2.33	2.33		2.33									1.47

CO	PO	Mapping	Justification
C368.1	PO1	3	Knowledge of engineering fundamental helps to Memorize Verilog/VHDL programs to simulate Combinational circuits in Dataflow, Behavioral and Gate level
	PO2	2	Students use different Dataflow, Behavioral and Gate level abstraction to analyze and find solution for problem statement.
	PO3	2	Writing programs using Dataflow, Behavioral and Gate level abstraction which help to design & develop problem statement.
	PO5	3	Apply appropriate techniques using different level abstraction to create solution for problem statement using EDA tools
	PSO2	2	Knowledge HDL helps the students to develop and program simple embedded system.
C368.2	PO1	3	Knowledge of engineering fundamental helps to Memorize flip flops and counters in Behavioral description.
	PO2	2	Students to analyze flip flops and counters in Behavioral description and find solution for problem statement.

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: SHARANAGOUDA.V.PATIL, PAWAN KUMAR R	

Course Name: DIGITAL COMMUNICATION				
Course Code: 15EC61	Sem:	6	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C309.1	Apply sampling and quantization to convert analog signals to digital signals
C309.2	Explain different digital modulation techniques
C309.3	Have detailed understanding of digital communication basics including matched filters, signal space methods and optimal receiver design
C309.4	Represent digital signals using Line codes,Explain spread spectrum modulation

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C309.1	3	3											2	
C309.2	2	2	3	3									2	
C309.3	2		2	3									2	
C309.4	2	3	2										2	
AVG	2.25	2.67	2.33	3.00									2.00	

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DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: Mr. VEERA REDDY , Mrs. MANJUVANI K M					
Course Name: ARM CONTROLLER & EMBEDDED SYSTEM					
Course Code: 15EC62	Sem:	6	Year		2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C310.1	Describe the architectural features and instructions of 32 bit microcontroller ARM Cortex M3.
C310.2	Apply the knowledge gained for Programming ARM Cortex M3 for different applications.
C310.3	Understand the basic hardware components and their selection method based on the characteristics and attributes of an embedded system.
C310.4	Develop the hardware /software co-design and firmware design approaches. Explain the need of real time operating system for embedded system applications.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C310.1	3	2												2
C310.2	3	3	3											3
C310.3	3	3	2											3
C310.4	3	3	2											3
AVG	3.00	2.75	2.33											2.75

C.C.

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DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: MR. LOKESH.K.S., MRS.ANITHA.A.			
Course Name: VLSI DESIGN			
Course Code: 15EC63	Sem: 6	Year	2017-2018

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
CO311.1	Demonstrate understanding of MOS Transistor theory,CMOS fabrication process flow & Technology scaling
CO311.2	Sketch the basic gates using the stick & layout Diagrams with the knowledge of physical Design Aspects.
CO311.3	Illustrate the subsystem Design Processes in VLSI Design & FPGA system Design
CO311.4	Interpret Testing & Testability issues in VLSI Design & Memory Elements.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C 311.1	2	1											2	
C 311.2	1	1	3										2	
C 311.3	1	2	3	3									2	
C 311.4	1	1	2	2									2	
AVG	1.25	1.25	2.66	2.5									2	

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DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: Dr. PRABHAVATHI S , PHANINDRA REDDY K	
Course Name: Computer Communication Network(CCN)	

Course Code: 15EC64	Sem:	6	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to …..
C 312.1	Understand the layering architecture of OSI reference model and TCP/IP protocol suite. ı
C 312.2	Understand the protocols associated with each layer.
C 312.3	Understand the different networking architectures and their representations.
C 312.4	Construct the various routing techniques and the transport layer services.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C312.1	3													
C312.2	3													2
C312.3	3	2	2											2
C312.4	3	3	3											2
AVG	3.00	2.50	2.50										ı	2.00

CO	PO	Mapping	Justification
C312.1	PO1	3	The students will be able to understand and apply the fundamental knowledge gained on computer networks.
C312.2	PO1	3	The students will be able to understand and apply the fundamental knowledge of TCP/IP Network model to the Internet
	PSO2	2	The students will be able to write programs on data transmission.
C312.3	PO1	3	The students will be able to understand and apply the fundamental knowledge of framing, MAC protocols , Wired and Wireless LANs.
	PO2	2	The students will be able to analyze the data transmission concepts related to framing, MAC Protocols, Wired and Wireless LANs.
	PO3	2	The students will be able to design, develop and apply the techniques involved in different networking architectures and their representations .
	PSO2	2	The students will be able to develop networking architectures
C312.4	PO1	3	The students will be able to understand and apply the fundamental knowledge of Internet Addressing schemes and Routing protocols.
	PO2	3	The students will be able to design, develop and apply the techniques involved in Internet Addressing schemes and Routing protocols.
	PO3	3	The students will be able to design, develop and apply the techniques involved in computer network's routing, switching and in security aspects.
	PSO2	2	The students will be able to write programs on routing the packets from source to destination

Course Coordinator

C.C.

Staff Signature

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: Mr. SHARANA BASAVARAJ B, NAGARAJ GOWDA H				
Course Name: DIGITAL SWITCHING SYSTEMS				
Course Code: 15EC654	Sem:	6	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
CO313.1	Explain hierarchy and Evolution of Digital Switching Systems.
CO313.2	Determine Telecommunication Traffic and Number of cross points for different Grading levels.
CO313.3	Describe Time, Space Switches and software technologies used in Digital Switching Systems.
CO313.4	Describe the Software aspects of switching systems and its maintenance.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO313.1	3	3	2										3	
CO313.2	3	3	3										3	
CO313.3	3	3											3	
CO313.4	3	3											2	
AVG	3.00	3.00	2.50										2.75	

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DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: Mrs. Chinna V Gowdar, Ms. Rohini H M					
Course Name: DSDV					
Course Code: 15EC663	Sem:	6	Year		2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
CO314.1	Construct the combinational circuits, using discrete gates and programmable logic devices.
CO314.2	Describe Verilog model for sequential circuits and test pattern generation.
CO314.3	Design embedded systems using small microcontrollers, larger CPUs/DSPs, or hard or soft processor cores, semiconductor memory for specific chip design.
CO314.4	Synthesize different types of processor and I/O controllers that are used in embedded system.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO314.1	2	3	3											2
CO314.2	3	2	2											3
CO314.3	2	3	3											2
CO314.4	2	3	3											2
AVG	2.25	2.75	2.75											2.25

CO	PO	Mapping	Justification
CO314.1	PO1	2	Knowledge of construction of combinational circuits, discrete gates and programmable logic devices are part of Engineering Fundamentals
	PO2	3	Knowledge of construction of combinational circuits, discrete gates and programmable logic devices are used to design system component that meets the specified needs.
	PO3	3	Knowledge of construction of combinational circuits, discrete gates and programmable logic devices are helpful to design solution for complex engineering problems.
	PSO2	2	Knowledge of construction of combinational circuits, discrete gates and programmable logic devices are used in Embedded System.
CO314.2	PO1	3	Verilog model for sequential circuits and test pattern generation are part of Engineering Fundamentals

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DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: VEERA REDDY,ROHINI HM, MANJUNATH K M / PRASHANTH KENI			
Course Name: EMBEDDED CONTROLLER LAB			
Course Code: 15ECL67	Sem: 6	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C315.1	Understand the instruction set of 32 bit microcontroller ARM Cortex M3, and the software tool required for programming in Assembly and C language.
C315.2	Interface external devices and I/O with ARM Cortex M3.
C315.3	Develop C language programs and library functions for embedded system applications.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C315.1	3	2												2
C315.2	3	3	3	2	2									3
C315.3	2	2	3											3
AVG	2.67	2.33	3.00	2.00	2.00									2.67

Name of the Staff: Mrs. Suvarna Patil/ Mrs. Manasa K Chigateri , Mr. Phanindra Reddy / Mr. Nagaraj Gowda H			
Course Name: Computer Networks lab			
Course Code: 15ECL68	Sem: 6	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ....
C316.1	Design and Simulate network elements with various protocols and standards.
C316.2	Use the modern network simulator tools for learning and practice of networking algorithms.
C316.3	Analyze and compare various networking algorithms.
C316.4	Demonstrate the working of various protocols and algorithms using C programming.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C316.1	2		3											
C316.2	2	2		3	3									
C316.3	3	3										2		
C316.4	2			3	3									3
AVG	2.25	2.50	3.00	3.00	3.00							2.00		3.00

CO	PO	Mapping	Justification
C316.1	PO1	2	The students will be able to understand and apply the fundamental Knowledge gained on network elements using various protocols and standards.
	PO3	3	The students will be able to design network elements using various protocols and standards.
C316.2	PO1	2	The students will be able to understand and apply the fundamental Knowledge gained on modern network simulator tools for learning and practice of networking algorithms.
	PO2	2	The students will be able to identify and analyze computer networking communication problems.
	PO4	3	The students will be able to investigate on wired and wireless networking communication issues and provide valid conclusions.
	PO5	3	The students will use the modern network simulator tools for learning and practice of networking algorithms.
C316.3	PO1	3	The students will be able to compare various networking algorithms.
	PO2	3	The students will be able to identify and analyze computer networking communication problems.

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DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: Dr.Prabhavati S / Mr.R Pawan Kumar, Suvarna S Patil				
Course Name: Computer Communication Network(CCN)				
Course Code: 10EC71	Sem:	7	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C401.1	Apply the fundamental knowledge of Data Communication Networks
C401.2	Explain the basics of various network models, apply the TCP/IP Network model to the Internet
C401.3	Analyze the basic concepts of Framing Noisy & Noiseless Protocols, Multiple Accesses Protocols, Wired & Wireless LAN's.
C401.4	Compare different Internet Addressing Schemes. Explain both Static & Dynamic Routing Protocols.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C 401.1	3		2											
C 401.2	3		3											2
C 401.3	3	2												2
C 401.4	2		3											2
AVG	2.75	2	2.66667											2

CO	PO	Mapping	Justification
C 401.1	PO1	3	The students will be able to understand and apply the fundamental knowledge gained on computer networks.
	PO3	2	The students will be able to design, develop and apply the techniques involved in computer network's routing, switching and in security aspects
C 401.2	PO1	3	The students will be able to understand and apply the fundamental knowledge of TCP/IP Network model to the Internet.
	PO3	3	The students will be able to design, develop and apply the techniques involved in computer network's routing, switching and in security aspects.
	PSO2	2	The students will be able to write programs on data transmission.
C 401.3	PO1	3	The students will be able to understand and apply the fundamental knowledge of framing, MAC protocols , Wired and Wireless LANs.
	PO2	2	The students will be able to analyze the data transmission concepts related to framing, MAC Protocols, Wired and Wireless LANs.
	PSO2	2	The students will be able to write programs on data transmission.
C 401.4	PO1	2	The students will be able to understand and apply the fundamental knowledge of Internet Addressing schemes and Routing protocols.
	PO3	3	The students will be able to design, develop and apply the techniques involved in Internet Addressing schemes and Routing protocols.
	PSO2	2	The students will be able to write programs on data transmission.

Course Coordinator

C.C.

Staff Signature

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DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: M.MD.ZAKIRULLA, Mrs. MANASA K CHIGATER					
Course Name: Optical Fiber Communication Systems					
Course Code: 10EC72	Sem:	7	Year		2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C402.1	Describe the basics of optical fiber communication & Transmission Characteristics of Optical Fiber.
C402.2	Explain different types & characteristics of optical source, detectors, fiber coupler & connectors.
C402.3	Explain optical Receiver operation& the concept of Analog & Digital Links in communication system
C402.4	Apply the WDM concepts and Components in the Networks. & gain the Knowledge about Optical Amplifiers and Networks.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C402.1	2	3	1	1									2	
C402.2	2	2	2										3	
C402.3	2	3	3	1									2	
C402.4	2	1	2										3	
AVG	2.00	2.25	2.00	1.00									2.50	

CO	PO	Mapping	Justification
C402.1	PO1	2	The student uses the basics of math's, science, & engineering fundamentals to define the concept of Ray theory, Numerical Aperture, Propagation of Modes in fiber and material, waveguide dispersions, and Fiber losses.
	PO2	3	Students will be able to analyze & find solution for Numerical Aperture ,No of modes in fiber, Attenuation, & material dispersion.
	PO3	1	Students will be able to understand block diagrams of Optical Fiber in Analog/Digital communications.
	PO4	1	Students will be able to conduct Experiment on Numerical Aperture in fiber communication
	PSO1	2	Students will be able to test the fiber.

C.C.

COURSE OUTCOMES 2016-17 PE

Name of the Staff: Mr.Dalal Shivakumar, Mr. Sharana Basavaraj B				
Course Name: Power Electronics				
Course Code: 10EC73	Sem:	7th	Year	2017-18

COURSE OUTCOME	DESCRIPTION
CO403.1	Outline the static, dynamic & control characteristics of various Power Semiconductor Devices & classify the power electronics circuits.
CO403.2	Describe the switching characteristics of Power Transistors, MOSFETS, IGBTS and the need for isolation of gate and base drives.
CO403.3	Summarize the need for high (di / dt) & (dv / dt) protections, performance parameters, firing circuits, switching characteristics & various commutation circuits for thyristor.
CO403.4	Explain the principle of operation of various Power Electronic Converters (AC Voltage Controllers, Choppers, Inverters and Controlled Rectifiers) for R-Load and RL-Load.

CO-PO/PSO MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO403.1	2													
CO403.2	2	3											2	
CO403.3	3	3											3	
CO403.4	2	3	3										3	
AVG.	2.5	3	3										2.5	

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DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: MRS.CHINNA V GOWDAR, LOKESH.K.S.				
Course Name: EMBEDDED SYSTEM DESIGN				
Course Code: 10EC74	Sem:	7	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C 404.1	Define Embedded system, major hardware and software components & basics of Design & Development process.(L1)
C 404.2	Classify memory devices, different caching schemes. discus design and development embedded life cycle models(L2)
C 404.3	Describe the Definition of Tasks, Threads, multiprocessing, , TCB, and OS Kernel, their responsibilities.(L2)
C 404.4	Examine the performance , quantification & evaluation of performance in embedded Designs.(L4)

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C 404.1	3	3												2
C 404.2		2	2											2
C 404.3		2	2	2										2
C 404.4		2	2	2										2
AVG	3.00	2.25	2.00	2.00										2.00

C.C.

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DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: Mrs.Suvarna S Patil , Mr.Santosh Mugali				
Course Name: DSPA&A				
Course Code: 10EC751	Sem:	7	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C405.1	Describe the Block Diagram of Digital Signal Processing. and its applications (L2)
C405.2	Demonstrate the Architecture of Programmable DSP's In General and also particularly TMS320C54XX processor (L3)
C405.3	Generalize the Instruction Set of TMS320C54XX Processor and Its Interfacing of Memory and Parallel I/O Peripherals .(L2)
C405.4	Illustrate The Implementation of Basic DSP and FFT Algorithms.(L3)

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C405.1	3	3	2											2
C405.2	3	2	2											2
C405.3	3	2	2	3									2	
C405.4	3	3	3	2									2	
AVG	3.00	2.50	2.25	2.50									2.00	2.00

CO	PO	Mapping	Justification
C405.1	PO1	3	Mapped with a value of 3 because it requires knowledge of mathematics ,science and the techniques are useful in solving complex engineering problems
	PO2	3	Mapped with a value of 3beacuse Identify complex engineering problems reaching substantiated conclusions using first principles of mathematics And natural sciences
	PO3	2	Mapped with a value of 2beacuse Solving Complex DSP Problems using Matlab Software and design the filters system components
	PSO2	2	Mapped with a value of 2 because Ability To design Filters like FIR and IIR Using MAT lab Tool
C405.2	PO1	3	Mapped with a value of 3 because it requires knowledge of mathematics ,science and the techniques are useful in solving complex engineering problems
	PO2	2	Mapped with a value of 2 because Ability To design DSP Multipliers
	PO3	2	Mapped with a value of 2 because it is applicable in natural science and engineering sciences
	PSO2	2	Mapped with a value of 2 because Ability To design DSP Multipliers

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

Name of the Staff: KHAJA MOINUDDIN, SHRIDHAR B				
Course Name: REAL TIME SYSTEM				
Course Code: 10EC762	Sem:	7	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C406.1	Explain the basics and importance of real-time systems and application of computer in control system
C406.2	Describe hardware required for developing a RTS and programming language basics
C406.3	Identify and Apply the functions of Real Time Operating System to real time system
C406.4	Discuss general approach for planning and designing of computer based system, Explain various methodologies and Apply in designing a real time system

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C406.1	2	2												
C406.2	2	2												
C406.3	2	3	2											
C406.4	2	2	3											
AVG	2.00	2.33	2.50											

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DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: Mr.Loksch K S , Ms. Manasa K Chigateri, Mr. Sharana Basavaraj B, Mr.Sudharshan B					
Course Name: VLSI lab					
Course Code: 18ECL77	Sem:	7	Year	2017 – 18	

COURSE OUTCOME STATEMENTS

At the end of the course, students will be able to.......

C407.1	Write the Verilog Code and Test Bench for An Inverter, Buffer, TG, Basic/Universal gates, Flip-flops, Adders, Counter, SAR and able to verify the simulation results
C407.2	Using the XILINX Tool able to synthesize & verify initial Timing diagram for Combinational circuits such as Buffer, basic gates, Coders, MUX, Digital Sequential circuits such as Flip-flops, counters etc.
C407.3	Sketch the Schematic & layout of Inverter, Basic gates Using EDA Tool.
C407.4	Outline the Schematic & layout of Amplifiers such as CS, CD, Differential Amplifier & OP-Amp etc

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C407.1	3	2	2	3	2								3	
C407.2	3	3	3	3	2								3	
C407.3	3	3	2	3	3								3	
C407.4	3	2	2	3	3								3	
AVG	3	2.5	2.25	3	2.5								3	

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

Name of the Staff: MR. Dalal Shivakumar, Mrs. A. Anitha, Mr sharanagouda v patil, Mr Zakirulla				
Course Name: POWER ELECTRONICS LAB				
Course Code: 10ECL78	Sem:	7	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C408.1	Sketch the static V-I Characteristics of various Power Semiconductor Devices like SCR, DIAC, MOSFET & IGBT.
C408.2	Design the various firing circuits (RC, UJT & Digital) with their input and output waveforms.
C408.3	Experiment the various Power Electronic Converters (AC Voltage Controllers, Choppers, Inverters and Controlled Rectifiers) for R and RL Loads
C408.4	Operate various motors (DC, Universal & Stepper) and test the commutation circuits (LC & Auxillary).

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C408.1	3	2	2	3	2								3	3
C408.2	3	3	3	3	2								3	3
C408.3	3	3	2	3	3								3	3
C408.4	3	2	2	3	3								3	3
AVG	3.00	2.50	2.25	3.00	2.50								3.00	3.00

CO	PO	Mapping	Justification
	PO1	3	The student uses the basic knowledge of Engineering to understand the Power Circuits Switching systems.
	PO2	2	The students are able to understand the concepts of SCR working Principle.
	PO3	2	The students are able to know the V-I characteristics of power semiconductor devices like SCR, MOSFET, DIAC & IGBT.
	PO4	3	The students are able to design and learn the experiments of SCR
	PO5	2	The students are able to design the experiments by using modern tool usage.
	PSO1	3	Knowledge of various switching systems used in electronics circuits and communication system.
C 408.1	PSO2	3	Ability to develop and design the experiments in the field of embedded

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DEPARTMENT OF ELECTRONICS &COMMUNICATIONENGINEERING

Name of the Staff: Md. ZAKIRULLA, Mr. PRASHANTH KENI					
Course Name: WIRELESS COMMUNICATION					
Course Code: 10EC81	Sem:	8 A & B	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ....
C409.1	Distinguish the overall 1G, 2G , 3G & 4G , Cellular System components and describe the concepts of wireless Network Architecture. (L2)
C409.2	Identify Cellular concept of Cell fundamentals, Capacity expansion techniques operation of GSM & TDMA Techniques and GSM channel concept. (L1)
C409.3	Explain the basics of GSM system operation, GSM Traffic cases & Discriminate the overall wireless Modulation and coding techniques Hardware's (L2)
C409.4	Describe CDMA Technology , CDMA channel concept and Summarize the wireless LAN 802.11x,802.15x & PAN application & Architecture. (L2)

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C409.1	2	2	2									2		
C409.2	2	2		2								2		
C409.3	2	2											2	
C409.4	2	2	2	2	2							2		
AVG	2.00	2.00	2.00	2.00	2.00							2.00	2.00	

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Name of the Staff: MR. VINAY .A., MRS. MANASA K CHIGATERI			
Course Name: DIGITAL SWITCHING SYSTEM			
Course Code: 10EC82	Sem: 8	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C 410.1	Explain the concepts of switching system and its developments.
C 410.2	Illustrate the switching traffic and its solution.
C 410.3	Express the switching classification of software architecture and developments.
C 410.4	Describe the different operating system in digital switching system and its maintains.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C 410.1	2	3	3										2	
C 410.2	3	3	2										3	
C 410.3	2		3										2	
C 410.4			3	3									3	
AVG	2.33	3.00	2.75	3.00									2.5	

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Name of the Staff: KHAJA MOINUDDIN, SHARANAGOUDA.V.PATIL				
Course Name: NETWORK SECURITY				
Course Code: 10EC832	Sem:	8	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ....
C 411.1	Identify common network security vulnerabilities/attacks and Apply various Symmetric cryptography techniques for Encryption & Decryption
C 411.2	Explain concepts related to asymmetric cryptography and examines the techniques used to signing & Verifying digital signatures
C 411.3	Recognize web security services & mechanisms, Examine strategies intended for prevention and detection from intrusion
C 411.4	Identify the possible threats due to virus, worms and counter measures to these threats and discuss firewall requirements & employ a firewall.

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C 411.1	2	3												
C 411.2	2	2	2											
C 411.3	2		2											
C 411.4	2		2											
AVG	2.00	2.50	2.00											

C.C.

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Name of the Staff: Dr. SAVITA SONOLI, SHRIDHAR S BILAGI			
Course Name: RTOS			
Course Code: 10EC842	Sem: 8	Year	2017-18

COURSE OUTCOME STATEMENTS

	At the end of the course, students will be able to ….
C412.1	Analyze Real Time Embedded System to understand requirements & their relation to System Resources. (L4)
C412.2	Demonstrate CPU, I/O interface, Memory & Multi Resource Management for Embedded Applications using RTOS (L3)
C412.3	Explain Soft Real Time Services, Hardware & Firmware Components & Software Applications for RTOS.(L2)
C412.4	Interpret Debugging, Performance Tuning, Design Reliable & Available Software and Summarize the PIC microcontroller features and structures of practical implementations using RTOS.(L3)

CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C412.1	2	2	2											2
C412.2	2	2	2											2
C412.3	2	2	2											2
C412.4	2	2	2											2
AVG	2.00	2.00	2.00											2.00

Department of
Computer science and Engineering

Course Outcomes

Academic Year 2017-18

COURSE OBJECTIVES, COURSE OUTCOMES & MAPPING

Staff Name: Sai Madhavi.D/Sarvar Begum

10CS753 ✓

Subject: Java And J2EE

Sem:VII

Course Objectives:
To *Understand* the Fundamental concepts of Java Programming language and *exemplify* the concepts of inheritance, Exception, and applets.
To *implement* and *exemplify* multithreaded programming, Event handling and Server Programming using servlets.
To *use* the concepts of Database Access using JDBC/ ODBC, and Enterprise Java Beans while developing Java applications.
To *employ* the concepts on Java Server Pages, Remote Method Invocation and Front end development using swing.

COURSE OUTCOMES:

CO No	Description
C405.1	To *Understand* the Fundamental concepts of Java Programming language and *exemplify* the concepts of inheritance, Exception, and applets.
C405.2	To *implement* and *exemplify* multithreaded programming, Event handling and Server Programming using servlets.
C405.3	To *use* the concepts of Database Access using JDBC/ ODBC, and Enterprise Java Beans while developing Java applications.
C405.4	To *employ* the concepts on Java Server Pages, Remote Method Invocation and Front end development using swing.

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
1	3	1	2	1	1									
2	3	2	3	2	3									
3	3	2	3	2	3									
4	3	2	3	2	3									
AVG	3	1.75	3.5	1.75	3.25									

CO	PO	Justification
C405.1	PO1	Students will be able to understand the fundamentals of Java Programming language
	PO2	Students will be able to identify, formulate the problem using fundamentals of java programming knowledge
	PO3	Students will be able to develop solutions to programming problems by understanding the fundamentals of the Java programming language.
	PO4	Students will be able to design the experiments to provide the conclusion
	PO5	Students will be able to understand the working of the modern tool (Java / JCreater / Eclipse)
C405.2	PO1	Students will be able to understand the fundamentals of Java multithread programming, Event handling, and Swings
	PO2	Students will be able to identify, formulate the problem using different programming constructs of java programming knowledge
	PO3	Students will be able to develop solutions to programming problems by understanding the fundamentals of multithreaded programming, event handling etc.
	PO4	Students will be able to design the experiments using multithreaded programming, event handling to provide the valid conclusion
	PO5	Students will be able to understand the working of the modern tool (Java / JCreater / Eclipse)
C405.3	PO1	Students will be able to understand the fundamentals of JDBC and EJB

	PO2	Students will be able to identify, formulate the problem using JDBC and EJB
	PO3	Students will be able to develop solutions to programming problems by understanding the database programming and Enterprise Java Beans
	PO4	Students will be able to design the experiments using database programming and Enterprise Java Beans to provide the valid conclusion
	PO5	Students will be able to understand the working of the modern tool (Java / JCreater / Eclipse)
C405.4	PO1	Students will be able to apply the fundamental knowledge of JSP, RMI and server programming (Servlets)
	PO2	Students will be able to identify, formulate the problem using JSP, RMI and server programming
	PO3	Students will be able to develop solutions to programming problems by understanding the JSP programming, RMI programming and server programming
	PO4	Students will be able to design the experiments using JSP, RMI and server programming.
	PO5	Students will be able to understand the working of the modern tool (Java / JCreater / Eclipse)
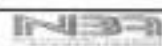
C# COURSE OUTCOMES & MAPPING

CO No	Description
CO1	Build applications on Visual Studio .NET platform by understanding the syntax and semantics of C#
CO2	Demonstrate Object Oriented Programming concepts in C# programming language
CO3	Design custom interfaces for applications and leverage the available built-in interfaces in building complex applications.
CO4	Illustrate the use of generics and collections in C#, Compose queries to query in-memory data and define own operator behaviour

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
1	3				2									
2	1	3			2									
3			3		2									
4	1		3		2									
AVG	1.6	6	6		2									

CO No	Justification
1	The content relevance of CO306.1 with the PO1 is high so the mapping strength is given as 3. CO306.1 is all about the C# programming which requires the basic Engineering programming knowledge (PO1). The content relevance of CO306.1 with the PO5 is Moderate so the mapping strength is given as 2. CO306.1 is all about the C# programming, students will be using Modern tool(PO5) Visual Studio 2015 for writing and executing their programs
2	The content relevance of CO306.2 with the PO1 is low so the mapping strength is given as 1. CO306.1 is all about demonstrating Object Oriented Programming concepts in C# programming language which requires the basic Engineering programming knowledge (PO1). The content relevance of CO306.2 with the PO2 is high so the mapping strength is given as 3. CO306.2 is all about the demonstrating Object

	Oriented Programming concepts in C# programming language, for which problem analysis (PO2) must be done. The content relevance of CO306.2 with the PO5 is Moderate so the mapping strength is given as 2. CO306.2 is all about the demonstration of Object Oriented Programming concepts in C# programming language which requires Modern tool (PO5) Visual Studio 2015.
3	The content relevance of CO306.3 with the PO3 is high so the mapping strength is given as 3. CO306.3 is all about Design custom interfaces for applications which maps to the PO3 and for which Modern tool (PO5) Visual Studio 2015 is required.
4	The content relevance of CO306.4 with the PO1 is low so the mapping strength is given as 1. CO306.4 is all about the C# programming which requires the basic Engineering programming knowledge (PO1). The content relevance of CO306.4 with the PO3 is high so the mapping strength is given as 3. CO306.3 is all about Design and writing programs for the complex engineering problems (PO3) and for which Modern tool (PO5) Visual Studio 2015 is required so the mapping strength for PO5 is given 2

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Advanced Computer Architecture(10CS74)

Course objectives

	At the end of the course Students are able to
C404.1	Distinguish various computer architecture and to solve hazards in ILP.(analyse,apply)
C404.2	Implement modern design structures of Pipelined and Multiprocessors systems.(create)
C404.3	Acquainted with recent computer architecture in cache and memory systems(analyse)
C404.4	Design EPIC and VLIW reports that imply some emergent topics supporting material essence (create)

CO-PO/PSO MAPPING 2016-17 (Odd Sem)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C404.1	2	2		3										
C404.2			3	2										
C404.3	3	3		3										
C404.4			3	2										
AVERAGE	2	2	2.75	2.25										

*Note: - 1:- Slight (Low)   2:- Moderate (Medium)   3:- Substantial (High).

JUSTIFICATION and ASSESSMENT TOOLS

To distinguish computer architecture and to solve hazards in ILP.(analyse,apply)

PO1: apply the knowledge of mathematics to distinguish computer architecture in terms of power,cost,performance,speed etc.,which is moderate hence strength is 2.

PO2:analysing classes of computers using fundaments of computer architecture which is moderate hence strength is 2.

PO4:Use the research based knowledge to compute and compare cost, speed, performance of different architecture and to decide the best architecture which is high hence strength is 3.

Assessment tools:IA-1/Assignments-1/Lab programs/Mini projects

To implement modern design structures of Pipelined and Multiprocessors systems.(create)

PO3:Design of Pipelined and Multiprocessors systemsarchitecture which is high hence strength is 3.

PO4:Use the research based knowledge to decide the best pipelined and multiprocessor systems which is moderate hence strength is 2.

Assessment tools:IA-2/Assignmants-2/mini-projects /Lab programs

To acquainted with recent computer architecture in cache and memory systems(analyse)

PO1: apply the knowledge of mathematics for optimization of cache performance which is high hence strength is 3.

PO2:analyse different optimization levels of cache which is high hence strength is 3.

PO4: Use the research based knowledge to decide cache performance which is high hence strength is 3.

To design EPIC and VLIW reports that imply some emergent topics supporting material essence (create)

PO3:Design of EPIC and VLIW systemsarchitecture which is high hence strength is 3.

PO4:Use the research based knowledge to compare EPIC and VLIW which is moderate

hence strength is 2.

Assessment tools:IA-2/Assignmants-2/mini-projects /Lab programs

Assessment tools:IA-2/Assignmants-2/mini-projects /Lab programs

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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Academic Year 2017-18

15CS553

COURSE OUTCOMES & MAPPING

CO No	Description
C305.1	Interpret and demonstrates the advanced Java concepts like enumerations, annotations and collections in developing modular and efficient programs
C305.2	Use the String class and its methods to deal with Strings successfully.
C305.3	Demonstrate how servlets and JSP fit into Java-based web application architecture
C305.4	Illustrate database access and details for managing information using the JDBC API

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
1	3	2	1		2									
2	3	2	1		2									
3	3	2	2		3									
4	3	2	2		3									
AVG	3	2	1.5		2.5									

CO No	Justification
C305.1	• **PO1:** Students will be able to understand the fundamental concepts like enumerations, annotations and collections in Java Programming language. • **PO2:** Students will be able to identify, formulate the problem using fundamental concepts of java programming knowledge. • **PO3:** Students will be able to develop solutions to IT problems by using the fundamentals of the Java programming language. • **PO5:** Students will be able to understand the working of the modern tool (Java / JCreater / Eclipse).
C305.2	• **PO1:** Students will be able to understand the basics of String class and its various methods.

	• **PO2:** Students will be able to identify, formulate the problem using fundamentals of String Operations. • **PO3:** Students will be able to use java's String class and its various methods to develop solutions to IT problems. • **PO5:** Students will be able to understand the working of the modern tool (Java / JCreater / Eclipse).
C305.3	• **PO1:** Students will be able to understand the essentials of Servlets and JSP in Web Application Programming. • **PO2:** Students will be able to identify, formulate the problem using basics of Servlets and JSP. • **PO3:** Students will be able to use java's Servlets, JSP and its various methods to develop web applications. • **PO5:** Students will be able to understand the working of the modern tool (Java / JCreater / Eclipse).
C305.4	• **PO1:** Students will be able to understand the fundamentals of JDBC. • **PO2:** Students will be able to identify, formulate the problem using JDBC. • **PO3:** Students will be able to develop solutions to programming problems by understanding the database program. • **PO5:** Students will be able to understand the working of the modern tool (Java / JCreater / Eclipse).

LAB COURSE OUTCOMES & MAPPING

DBMS lab

CO No	Description
C308.1	Create, update and query on the database.
C308.2	Demonstrate the working of different concepts of DBMS
C308.3	Implement, analyse and evaluate the project developed for an application.

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
1	2	3	3		3	2					2			2
2	2	2			3	2					2			2
3	2	2	3	2	3	2			3	2	2			2
4														
AVG	2	2.3	3	2	3	2			3	2	2			2

COURSE OUTCOMES & MAPPING

Staff Name: Nagaveni Biradar/Sarvar Begum

Subject: DAA/15CS43   **Sem: IV**

CO No	Description
C211.1	Able to understand various problem solving techniques.
C211.2	Able to analyse the efficiency of various algorithms.
C211.3	Able to apply appropriate methods to solve a given problem through algorithm representations.
C211.4	Able to understand problems related to polynomial time algorithms.

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
C211.1	3													
C211.2	3	3		2										
C211.3	3	3	3	2										
C211.4	3													
AVG	3	3	3	2										

CO No	Justification
C211.1	Students are able to learn the basic concepts of algorithms,So CO1 is mapped to Engineering knowledge(PO1)
C211.2	Students are able to understand, analyse any given problem by using various algorithmic design techniques . So CO2 is mapped to PO1,PO2. Students are able to conduct investigation of given algorithms in terms their efficiencies. So CO2 is mapped to PO4
C211.3	Students are able to analyse the given problem statement. So CO3 is mapped to PO2.Students are able to design the algorithms by using various algorithmic design techniques.. So CO3 is mapped to PO3 Students are able to conduct investigation of given algorithms in terms their efficiencies. So CO2 is mapped to PO4
C211.4	Students are able to understand the concepts related to algorithms which are solved in Polynomal time
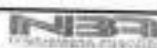
COURSE OUTCOMES & MAPPING

Staff Name: Nagaveni Biradar/Sarvar Begum

Subject: DAA Lab /15CSL47

Sem: IV

CO No	Description
C217.1	Design algorithms using appropriate design techniques (brute-force, divide and conquer, greedy, dynamic programming, etc.)
C217.2	Implement a variety of algorithms such assorting, graph related, combinatorial, etc., in a high level language
C217.3	Analyze and compare the performance of algorithms using language features.
C217.4	Apply and implement learned algorithm design techniques and data structures to solve real world problems.

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
C217.1	3	3	3	2	3									
C217.2	3	3	3	2	3									
C217.3	3	3		2	3									
C217.4	3	3	3	2	3									
Average	3	3	3	2	3									

PO No	Justification
PO1	Students are able to understand the basics of algorithms, basics of using java Programs using eclipse.
PO2	Students are able to analyse the various algorithms using the concepts of java programming language
PO3	Students are able to implement the various algorithms using the concepts of java programming language
PO4	Students are able to conduct investigation of given algorithms in terms their efficiencies.
PO5	Students are able to use the modern tool like JDK, Eclipse

CN-LAB

Academic Year 2017-18   15CSL57

Computer network LAB COURSE OUTCOMES & MAPPING

CO No	Description
C01	Able to Analyze, Compare and implement various networking protocols.
C02	Able to Implement and study the performance of GSM using MAC layer and of CDMA using stack called Call net on NS2/NS3
C03	Able to implement error detecting code using CRC-CCITT (16- bits) and shortest path between vertices using bellman-ford algorithm in java.
C04	Able to implement client server program using TCP/IP sockets, RSA algorithm to encrypt and decrypt the data and congestion control using leaky bucket algorithm in java language.

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
1	2	3	3		3							3	3	
2	2	3	3		3							3	3	
3	2	3	3		3							3	3	
4	2	3	3		3							3	3	
AVG	3	3	3		3							3	3	

CO No	Justification
1	Students are able to understand, Analyze, Compare various networking protocols so CO is mapped to PO1, PO2, PO3, PO5 and PO12.
2	Students are able to Implement and study the performance of GSM using MAC layer and of CDMA using stack called Call net on NS2/NS3 so CO is mapped to PO1, PO2, PO3, PO5 and PO12.
3	Students are able to implement error detecting code using CRC-CCITT (16- bits) and shortest path between vertices using bellman-ford algorithm in java so CO is mapped to PO1, PO2, PO3, PO5 and PO12.
4	Students are able to implement client server program using TCP/IP sockets, RSA algorithm to encrypt and decrypt the data and congestion control using leaky bucket algorithm in java language so CO is mapped to PO1, PO2, PO3, PO5 and PO12.

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COURSE OUTCOMES & MAPPING

CO No	Description
C402.1	Able to describe the basics of embedded systems and understand various instructions of ARM processors.
C402.2	Able to analyze and design various embedded system programs.
C402.3	Able to understand the basics of RTOS
C402.4	Able to understand different embedded systems development environments and analyze different simulators used in embedded systems

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
C402.1	2	2	2											
C402.2		3	3	2										
C402.3	1	2	2	2										
C402.4		2	2		3							1		
AVERAGE	1.5	2.25	2.25	2	3							1		

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
C402.1	33%	33%	34%											
C402.2		35%	35%	30%										
C402.3	10%	30%	30%	30%										
C402.4		25%	25%		35%							15%		
AVERAGE	1.5	2.25	2.25	2	3							1		

Level 1 -5%-18%------------------1
Level 2- 19%-34%----------------2
Level 3 – 35% and above---------3

CO No	Justification
1	PO1 PO2 and PO3 are contributing 33% so Contribution is 2
2	PO2 and PO3 are contributing 33% so Contribution is 3 PO4 are contributing 33% so Contribution is 2
3	PO1 are contributing 10% so Contribution is 1 PO2,3,4 are contributing 30% so Contribution is 2
4	PO2,3 are contributing 25% so Contribution is 2 PO5 are contributing 35% so Contribution is 3 PO12 are contributing 15% so Contribution is 1

Sub:Embedded Computing Systems   10CS72   VII Sem
Staff: 1.Shiva Kumar.V
       2.KS.Raghukumar.

Academic Year 2017-18 ODD Sem

Staff Name: Pampapathi B M	Sem:VII	Sec: B
Course Name: C# and .NET Programming	Course Code: 10CS761	

COURSE OUTCOMES & MAPPING

CO No	Description
CO406.1	To Understand the basics of .NET framework , .NET namespaces and Assemblies.
CO406.2	To Understand C# language fundamentals and design , develop C# applications.
CO406.3	To Understand , analyze and use C# language interfaces , collections and use the Knowledge of object oriented Concepts.
CO40.4	To understand , analyze and use C# delegates , events , exceptions , .NET Remoting and Serializations.

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
1	2	---	2	---	---	---	---	---	---	---	---	---	-----	-----
2	3	3	3	---	3	---	---	---	---	---	---	---	-----	-----
3	1	1	---	---	---	---	---	---	---	---	---	---	-----	-----
4	---	2	---	2	---	---	---	---	---	---	---	---	-----	-----
AVG	2	2	2.5	2	3									

WEB-Programming-COURSE OUTCOMES & MAPPING -ODD-7th.

CO No	Description
CO1	Able to describe fundamentals of web and identify ,demonstrate the different mark up languages and style sheets
CO2	Able to define and evaluate CSS, Java Scripts and dynamic documents
CO3	Able to define and demonstrate the various syntax of XML, PERl and CGI
CO4	Able to identify and demonstrate the various operations of PHP and Ruby Rails

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
1		2		2								2	2	
2	3	3	3	3								3	3	
3	2	2	2	2								2	2	
4	3	3	3	3								3	3	
AVG	2.66	2.5	2.66	2.5							2.5	2.5	2.66	

CO No	Justification
1	The depth of understanding and applying CO1 is demonstrated by doing the static web pages using simple tags in Web mini project
2	The depth of understanding, applying and analyzing CO2 is demonstrated by doing the static web pages using simple tags in Web mini project, Lab assignments, Class Assignments
3	The depth of understanding, applying CO3 is demonstrated by doing lab exercises, writing assignments, doing mini projects
4	The depth of understanding, applying CO4 is demonstrated by doing lab exercises, writing assignments, doing mini projects

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COURSE OUTCOMES (LAB) 2017-18 (Odd Sem)

III NW Lab
10CSL77
NW - LAB

COURSE OUTCOME	DESCRIPTION
C407.1	Able to design networks and implement them using TCP and UDP protocols
C407.2	Able to analyze simulator and plot the behavior through graph ,ping messages ,ESS mobile station.
C407.3	Able to implement networks algorithm on like RSA, CRC, Leaky bucket.
C407.4	Able to implement network protocols as TCP and UDP on client server.
C407.1	Able to design networks and implement them using TCP and UDP protocols

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C407.1					3								2	
C407.2					3								3	
C407.3		2	3	2								3	3	
C407.4				2					3				3	

CO No	Justification
1	Po5 is high , here we apply the nw simulators are used,
2	Po5 is high , here we apply the nw simulators are used,
3	Po3 is moderate , here we apply the nw simulators are used, Po2 is high we apply problem analysis Po5 is moderate , here we apply the nw simulators are used, Po2 is moderate we apply life long learning
4	Po4 is high , here we apply the nw fundamentals, Po9 is moderate we apply problem analysis

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Academic Year 2017-18

10CS71

COURSE OUTCOMES & MAPPING — ODD

CO No	Description
CO401.1	Able to analyze the system requirements and design models using UML.
CO402.2	Able to create the OO design of a system from the requirements model.
CO403.3	Able to develop a software by implementing the OO design models.
CO404.4	Able to implement patterns in developing a solution to a problem.

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
1			2	3	3	1			3	2	2	1		1
2						2			2					1
3						2			2	3	3			2
4			3	1	1				3	3	2	1		2
AVG			3	2	2	2			2	3	3	1		1.5

CO No	Justification
1	The content relevance of C403.1 with the PO4, PO5 and PO9 are high, PO3, PO10 and PO11 are moderate and PO6, PO12 and PSO2 are low.
2	The content relevance of C403.2 with the PO6 and PO9 are moderate and PO1 is low.
3	The content relevance of C403.3 with the PO10, and PO11 are high, PO6, PO9 and PSO2 are moderate.
4	The content relevance of C403.4 with the PO3, PO9 and PO10 are high, PO11, and PSO2 are moderate and PO4, PO5 and PO12 are low.

COURSE OUTCOMES 2017-18

Staff Name: D.V.Swetha Ramana/Naveen Kumar B	Sem: VII	Sec: A
Course Name: Web Programming Lab	Course Code:10CSL78	Total Contact Hours : 52

At the end of the course, students will be able to	
CO408.1	Apply XHTML, Javascript, XML, CSS, XSLT,and able to design a webpage.
CO408.2	Apply perl programs to develop more interactive webpages.
CO408.3	Utilize PHP, mysql and rails application to develop webpages with database connectivity.
CO408.4	Design and develop an interactive webpage.

CO-PO mapping Matrix

Web Programming Laboratory (10CSL78)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS O1	PS O2
CO408.1	3	3	3										-----	-----
CO408.2	3	3	3										-----	-----
CO408.3	3	3	3										-----	-----
CO408.4		3	3	3								1	-----	-----

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COURSE OUTCOMES & MAPPING

Double

Staff Name: Dr. THR/DVSR/HC	Semester:		VII	Odd				Sec:	A	B
Course Name: OOMD	Course Code:	1	0	C	S	7	1			
Verified By:	Date of preparation: 03/08/2017									
Academic year	**2017–2018**									

CO No	Description
CO401.1	Able to analyze the system requirements and design models using UML.
CO402.2	Able to create the OO design of a system from the requirements model.
CO403.3	Able to develop software by implementing the OO design models.
CO404.4	Able to implement patterns in developing a solution to a problem.

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
1			2	3	3	1			3	2	2	1		1
2						2			2					1
3						2			2	3	3			2
4			3	1	1				3	3	2	1		2
AVG			3	2	2	2			2	3	3	1		1.5

Program Coordinator

(Sign with Date)

(Swetha Ramona. V)
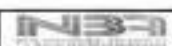
COURSE OUTCOMES & MAPPING

Staff Name: DVSR/KSA	Semester:		V/VII	Odd				Sec:	A	B
Course Name: OOMD	Course Code:	1	5	C	S	5	5	1		
Lab Course Name: WP	Lab Course Code:	1	0	C	S L	7	8			
Verified By:	Date of preparation: 03/08/2017									
Academic year	**2017–2018**									

CO No	Description
C305.1	Describe the concepts of object-oriented and basic class modeling.
C305.2	Understand the facets of the unified process approach to design and build a software system.
C305.3	Draw class diagrams, sequence diagrams and interaction diagrams to solve problems.
C305.4	Choose and apply a befitting design pattern for the given problem.

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
1	3													2
2	3													2
3		3	3											3
4				3								2		3
AVG	3	3	3	3								2		2.5

Program Coordinator
(Sign with Date)

COURSE OUTCOMES & MAPPING

CO No	Description
CO1	Observe the evaluation of storage technology and identify the functions to build data centre.
CO2	Analyze RAID levels and the components of Intelligent storage system, Network attached storage system and Direct attached storage system.
CO3	Analyze Content attached storage system and the significance of storage virtualization.
CO4	Analyze and Design storage solutions that effectively meet security, resilience and availability requirements for a variety of business needs.

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	PSO1	PSOS2
1	2	3	–	–	–	–	–	–	–	–	–	–	2	
2	–	3	–	–	–	–	–	–	–	–	–	–	2	
3	–	3	–	–	–	–	–	–	–	–	–	–	2	
4	–	3	3	2	–	–	–	–	–	–	–	–	2	
AVG	2	3	3	2	–	–	–	–	–	–	–	–	2	

Subject → SAN
Sem → 7th Sem
Subject code → 10CS765

CO No	Justification
CO1	• Students are able to apply the knowledge of storage area networks, a network engineering specialization to provide solutions of the evolving business needs and data centres. Hence the CO1 is moderately correlated to PO1: Engineering Knowledge. The mapping strength is demonstrated in the above table as '2'. • Students are able to identify, formulate and review the literature of the storage technology using the concepts of data computing, operating system and computer networks/interfaces. Hence the CO1 is **substantially** correlated to PO2: Problem analysis. The mapping strength is demonstrated in the above table as '3'. • Students are able to apply, identify, formulate and review the literature of the storage technology using the concepts of data computing, operating system and computer networks/interfaces. CO1 is **moderately** correlated to PSO1: Computer Networking. The mapping strength is demonstrated in the above table as '2'.
CO2	• Students are able to identify, formulate and review the literature of the storage technology using the concepts of data computing, operating system and computer networks/interfaces. Hence the CO2 is **substantially** correlated to PO2: Problem analysis. The mapping strength is demonstrated in the above table as '3'.
CO3	• Students are able to identify, formulate and review the literature of the storage technology using the concepts of data computing, operating system and computer networks/interfaces. Hence the CO3 is **substantially** correlated to PO2: Problem analysis. The mapping strength is demonstrated in the above table as '3'.

Double

Advanced Computer Architecture(10CS74)

Course objectives

	At the end of the course Students are able to
C404.1	Distinguish various computer architecture and to solve hazards in ILP.(analyse,apply)
C404.2	Implement modern design structures of Pipelined and Multiprocessors systems.(create)
C404.3	Acquainted with recent computer architecture in cache and memory systems(analyse)
C404.4	Design EPIC and VLIW reports that imply some emergent topics supporting material essence (create)

CO-PO/PSO MAPPING 2016-17 (Odd Sem)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C404.1	2	2		3										
C404.2			3	2										
C404.3	3	3		3										
C404.4			3	2										
AVERAGE	2	2	2.75	2.25										

*Note: - 1:- Slight (Low)   2:- Moderate (Medium)   3:- Substantial (High).

JUSTIFICATION and ASSESSMENT TOOLS

To distinguish computer architecture and to solve hazards in ILP.(analyse,apply)

PO1: apply the knowledge of mathematics to distinguish computer architecture in terms of power,cost,performance,speed etc.,which is moderate hence strength is 2.

PO2:analysing classes of computers using fundaments of computer architecture which is moderate hence strength is 2.

PO4:Use the research based knowledge to compute and compare cost, speed, performance of different architecture and to decide the best architecture which is high hence strength is 3.

Assessment tools:IA-1/Assignments-1/Lab programs/Mini projects

To implement modern design structures of Pipelined and Multiprocessors systems.(create)

PO3:Design of Pipelined and Multiprocessors systemsarchitecture which is high hence strength is 3.

PO4:Use the research based knowledge to decide the best pipelined and multiprocessor systems which is moderate hence strength is 2.

Assessment tools:IA-2/Assignmants-2/mini-projects /Lab programs

To acquainted with recent computer architecture in cache and memory systems(analyse)

PO1: apply the knowledge of mathematics for optimization of cache performance which is high hence strength is 3.

PO2:analyse different optimization levels of cache which is high hence strength is 3.

PO4: Use the research based knowledge to decide cache performance which is high hence strength is 3.

To design EPIC and VLIW reports that imply some emergent topics supporting material essence (create)

PO3:Design of EPIC and VLIW systemsarchitecture which is high hence strength is 3.

PO4:Use the research based knowledge to compare EPIC and VLIW which is moderate

EVEN SEM

2017-2018

OOC--COURSE OUTCOMES & MAPPING   SUB:OOC – Even – 4th.

CO No	Description
CO204.1	Able to describe, distinguish procedure and object oriented concepts.
CO204.2	Able to design and demonstrate real time applications using object oriented programming
CO204.3	Able to analyze and solve the multiprocessing , threading issues and inter process communication
CO204.4	Able to design and develop GUI based applications using eclipse

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
1	3													
2			3											
3		3												
4		2	2		3									
AVG	3	2.5	2.5		3									

CO No	Justification
CO204.1	CO204.1 is mapped to PO1 with the mapping strength 3 because the concepts correlation is high
CO204.2	CO204.2 is mapped to PO3 with the mapping strength 3 because the concepts correlation is high
CO204.3	CO204.3 is mapped to PO2 with the mapping strength 3 because the concepts correlation is high
CO204.4	CO204.4 is mapped to PO2.PO3 and PO5 with the mapping strength 2,2 and 3 because the concepts correlation is Moderate, Moderate and high

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TIME TABLE-2018-19 ODD SEMESTER(WEF 01-08-2018)

SEM:- V   SECTION:- A   ROOM NO:-LH-03

	9.00 – 9.55	9.55-10.50	10.50 - 11.00	11.00 - 11.55	11.55-12.50	12.50 - 02.15	2.15 - 3.10	3.10 – 4.05	4.05-5.00
MON	.NET/CC	DBMS	B	OOMD/ADV-JAVA	ATC	L	ME	OOMD/ADV-JAVA	ATC
TUE	DBMS	ME	R	ATC	CN	U	OOMD/ADV-JAVA	DBMS	.NET/CC
WED	CN	CN-A1/DBMS-A2				N	ME	ATC	CN
THU	ME	DBMS	E	OOMD/ADV-JAVA	.NET/CC	C	CN-A2/DBMS-A3		
FRI	ATC	CN	A	DBMS	OOMD/ADV-JAVA	H	CN-A3/DBMS-A1		
SAT	.NET/CC	CN	K	ME	.NET/CC		Tutorial Class	Tutorial Class	Remedial Class

Subject Handled by Faculty

Subject Code	Subject Name	Faculty Name	Subject Code	Subject Name	Faculty Name
15CS51	MANAGEMENT AND ENTREPRENEURSHIP	SHIVA PRASAD KM	15CS553	PROFESSIONAL ELECTIVE 1 (ADVANCED JAVA AND J2EE)	Dr.VEERAGANGADHARA SWAMY TM
15CS52	COMPUTER NETWORKS	SAPNA B KULKARNI/SURESH.K	15CS564	OPEN ELECTIVE 1(DOT NET FRAMEWORK FOR APPLICATION DEVELOPMENT)	ROSHAN D
15CS53	DATA BASE MANAGEMENT SYSTEM	Dr H.GIRISHA	15CS565	CLOUD COMPUTING	PRASANA KUMAR SHIVA RADDI
15CS54	AUTOMATA THEORY AND COMPUTABILITY	JAGADEESH G M	15CSL57	COMPUTER NETWORK LABORATORY	SAPNA B KULKARNI/ PRASANA KUMAR RADDI
15CS551	OBJECT ORIENTED MODELLING & DESIGN	MANJULA PATIL	15CSL58	DATA BASE MANAGEMENT SYSTEM LABORATORY WITH MINI PROJECT	SARVAR BEGUM/Dr SAIMADHAVI D

CO-ORDINATOR   HOD-CSE   PRINCIPAL

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COURSE OUTCOMES & MAPPING – SE(EVEN)

CO No	Description –
CS202.1	Understand the basics concepts of software engineering and requirements of software
CS202.2	Analyze and Design a software system, component, or process to meet desired needs within realistic constraints.
CS202.3	Apply the techniques, skills, and engineering tools necessary for engineering practice
CS202.4	Illustrate professional and ethical responsibility

CO	Programme outcome												Specific outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
1	3											3		3
2			3				3	3				3		3
3				3								3		3
4								3				3		3
AVG	3		3		3		3					3		3

CO No	Justification
1	CO01 is mapped to PO1(Engineering Knowledge) as it is necessary to have basic engineering knowledge to solve the software problem so it relevance is high (3)and it also mapped to PO12(Life long Learning) it is life long learning Process so its relevance is high(3)
2	CO2 is mapped to PO3(Design/Development of solution) it is necessary to analyze and to design a complex software system it relevance is high(3) and we have to follow the professional ethics and we have to assesses social ,cultural and safety aspects while design & its a life long process so the PO 7,8,12 have high relevance(3)
3	CO3 is mapped to PO5 and PO12 as it necessary to select and apply appropriate techniques and tools to solve the complex engineering problems so its relevance is high(3)
4	CO4 is mapped to PO8 (Ethics) as it necessary to follow and apply ethical principles and professional ethics and also the norms of engineering practice so its relevance is high(3)

Name : Suresh

Subject : Software Engineering (IV B-Sec)

MICROPROCESSORS AND MICROCONTROLLERS
SEMESTER – IV
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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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M&M

Subject Code		15CS44	IA Marks	20
Number of Lecture Hours/Week		Academic Year 2017-18	Exam Marks	80
Total Number of Lecture Hours		50	Exam Hours	03

CO No	Description
C204.1	Differentiate between microprocessors and microcontrollers (L2)
C204.2	Design and develop assembly language code to solve problems(L6,L3)
C204.3	Gain the knowledge for interfacing various devices to x86 family and ARM processor(L1)
C204.4	Demonstrate design of interrupt routines for interfacing devices (L3,L6)

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
C204.1	2	2												
C204.2		2	3											
C204.3	3													
C204.4			3											
AVG														

CO No	Justification
C204.1	Differentiate between microprocessors and microcontrollers (L2),The topics enable the students to differentiate between microprocessors where they study the different architecture ,addressing mode and instructions
C204.2	Design and develop assembly language code to solve problems (L6,L3).Students are able to write assembly language programs based on the problem statements given.
C204.3	Gain the knowledge for interfacing various devices to x86 family and ARM processor(L1). Students are able to identify various interfacing techniques.
C204.4	Demonstrate design of interrupt routines for interfacing devices(L3,L6).Students are able to identify, analyse and implement various interfacing techniques by writing suitable interfacing programmes

```
#include <stdio.h>
# include < math.h>
#define MAXSIZE 10.
 void main()
 {
  float x[MAXSIZE];
  int i, n;
  float *ptr, average, variance, std-diveation, sum=0, sum=0
                                    sum=0;
  printf(" Enter the value of N\n");
  scanf("%d", &n);
  printf("Enter %d real number\n", n);
  for (i=0; i<n; i++):
  {
  scanf("%f", &x[i]);
  }
  ptr = x;
  /* compute the sum of all elements */.
  for (i=0; i<n; i++).
  {
  sum = sum + *ptr;
   ptr++;
  }
  average = sum/n;
  ptr=x;
   /* compute variance and standard deviation/
   for (i=0; i<n; i++)
   {
      sum1 = sum1 + pow((*ptr - average), 2);
```

15CS46

COURSE OBJECTIVES, COURSE OUTCOMES & MAPPING

Staff Name: Dr. Anuradha / Raghu Kumar KS / NaveenKumar B. / Vinutha Prashanth

Subject: Data Communication   Sem: IV

Course Objectives:
• Comprehend the transmission technique of digital data between two or more computers and a computer network that allows computers to exchange data.
• Explain with the basics of data communication and various types of computer networks;
• Illustrate TCP/IP protocol suite and switching criteria.
• Demonstrate Medium Access Control protocols for reliable and noisy channels.
• Expose wireless and wired LANs along with IP version.

COURSE OUTCOMES:

CO No	Description
C214.1	Able to understand the transmission technique of digital data between two or more computers and a computer network that allows computers to exchange data.
C214.2	Able to understand basics of data communication and various types of computer networks and Illustrate TCP/IP protocol suite and switching criteria
C214.3	Able to apply Medium Access Control protocols for reliable and noisy channels.
C214.4	Expose wireless and wired LANs along with IP version.

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
1	3	3	2										2	
2	2	3	3	2									3	
3	2	3	3	3									3	
4	2	2	2	2									2	
AVG	2.25	2.75	2.5	2.33									2.5	

C214.1: course outcome1 mapping to PO1, PO2, PO3, PO5 and PSO1 between the ranges of 20% to 30%

C214.2: course outcome1 mapping to PO1, PO2, PO3, PO5 and PSO1 between the ranges of 20% to 30%

C214.3: course outcome1 mapping to PO1, PO2, PO3, PO5and PSO1 between the ranges of 20% to 30%

C214.4: course outcome1 mapping to PO1, PO2, PO3, PO5 and PSO1 between the ranges of 25%

LEVEL of CO-PO mapping

Level 1- 5% to 14%   -1

Level 2 -15% to 25% -2

Level 3- 26% to above- 3

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COURSE NAME: DIGITAL COMMUNICATION
COURSE CODE : 15CS46   COURSE INDEX : C214 ACADEMIC YEAR: 2017-18
STAFF NAME   : RAGHU KUMAR K.S   IV-B

Double

JUSTIFICATION OF CO-PO

CO Index	Course Outcomes:
C214.1	Able to understand the transmission technique of digital data between two or more computers and a computer network that allows computers to exchange data.
C214.2	Able to understand basics of data communication and various types of computer networks and Illustrate TCP/IP protocol suite and switching criteria
C214.3	Able to apply Medium Access Control protocols for reliable and noisy channels.
C214.4	Expose wireless and wired LANs along with IP version.

CO Index	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C214.1	3	3	2		3								2	
C214.2	2	3	3		3								3	
C214.3	2	3	3		3								3	
C214.4	2	2	2		2								2	
AVERAGE	2.25	2.75	2.5		2.75								2.5	

C214.1: course outcome1 mapping to PO1, PO2, PO3, PO5 and PSO1 between the ranges of 20% to 30%

C214.2: course outcome1 mapping to PO1, PO2, PO3, PO5 and PSO1 between the ranges of 20% to 30%

C214.3: course outcome1 mapping to PO1, PO2, PO3, PO5and PSO1 between the ranges of 20% to 30%

C214.4: course outcome1 mapping to PO1, PO2, PO3, PO5 and PSO1 between the ranges of 25%

LEVEL of CO-PO mapping

Level 1- 5% to 14%   -1

Level 2 -15% to 25% -2

Level 3- 26% to above- 3

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BELLARY
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE NAME: DIGITAL COMMUNICATION
COURSE CODE : 15CS46   COURSE INDEX : C214 ACADEMIC YEAR: 2016-17
STAFF NAME   : RAGHU KUMAR K.S   IV-B

SL.NO	Course objectives:
1	Comprehend the transmission technique of digital data between two or more computers and a computer network that allows computers to exchange data.
2	Explain with the basics of data communication and various types of computer networks;
3	Illustrate TCP/IP protocol suite and switching criteria.
4	Demonstrate Medium Access Control protocols for reliable and noisy channels.
5	Expose wireless and wired LANs along with IP version.

CO Index	Course Outcomes:
C214.1	Able to understand the transmission technique of digital data between two or more computers and a computer network that allows computers to exchange data.
C214.2	Able to understand basics of data communication and various types of computer networks and Illustrate TCP/IP protocol suite and switching criteria
C214.3	Able to apply Medium Access Control protocols for reliable and noisy channels.
C214.4	Expose wireless and wired LANs along with IP version.

CO Index	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C214.1	3	3	2										2	
C214.2	2	3	3	2									3	
C214.3	2	3	3	3									3	
C214.4	2	2	2	2									2	
AVERAGE	2.25	2.75	2.5	2.33									2.5	

Signature of Staff   **Course Coordinator**

Academic Year 2017-18

LAB COURSE OUTCOMES & MAPPING

MICROPROCESSOR AND MICROCONTROLLER LABORATORY
[As per Choice Based Credit System (CBCS) scheme] (Effective
from the academic year 2016 -2017)
SEMESTER – IV

Subject Code		15CSL48	IA Marks	20
Number of Lecture Hours/Week		01 I + 02 P	Exam Marks	80
Total Number of Lecture Hours		40	Exam Hours	03

CO No	Description
C216.1	Learn 80x86 instruction sets and gains the knowledge of how assembly language works.L1
C216.2	Design and implement programs written in 80x86 assembly language . L5
C216.3	Know functioning of hardware devices and interfacing them to x86 family.L1
C216.4	Choose processors for various kinds of applications.L1

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
C216.1	2													
C216.2			3	3	3									
C216.3	3	3	3	3										
C216.4		2	3	3										
AVG	2.5	2.5	3	3	3									

CO No	Justification
1	Basic of all microprocessor architectures are discussed. It also discusses the instruction set architectures of various microprocessors
2	Includes the design and implementation details of ALP of 8086 and all the 32 bit microprocessors. Basic Programs are implemented using 8086 ALP programming.MASM is used as tool to implement the ALP.
3	Basics of all the Interfacing devices and the hardware circuitry is discussed .Programs relating to the interfacing using 8086 are executed.
4	Difference and implementation details of Various processors and architectures are discussed.

```
      ptr++;
   }
   variance = sum1/u;
   std_deviation = sqrt(variance);
   printf("\n sum of all numbers = %f\u", sum);
   printf("Average of all elements = %.2f\u", avge);
   printf("variance of all elements = %.2f\u", variance);
   printf("Standard deviation = %.2f\u", deviation);
   getch();
}
```

COURSE OUTCOMES & MAPPING - <u>CNSC</u>

The students should be able to:

CO No	Description
1	Discuss cryptography and its need to various applications.
2	Design and develop public key cryptography and RSA algorithms.
3	Design and develop key Management cryptography algorithms.
4	Understand IEEE 802.11 Wireless LAN security and need cyber Law.

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
1	1	2	2	2								2	2	
2	1	2	2	2								2	2	
3	1	2	2	2								2	2	
4	2	2										2	2	
AVG	1.25	2	2	2								2	2	

CO No	Justification
1	Students are able to learn, Analyse and design the solutions of cyber security algorithms, so CO1 is mapped to PO1 ,PO2,PO3 and PO4.
2	Students are able to learn, Analyse and design the solutions of Public key cryptographic Techniques, so CO1 is mapped to PO1 ,PO2,PO3 and PO4.
3	Students are able to learn, Analyse and design the solutions of Key management Techniques, so CO1 is mapped to PO1 ,PO2,PO3 and PO4.
4	Students are able to learn and Analyse the IEEE 802.11 wireless LAN Security and IT Act and Cyber laws,so CO1 is mapped to PO1 and PO2.

15CS662

COURSE OUTCOMES & MAPPING

Staff Name: Dr.Veer Gangadhar Swamy/Sarvar Begum/Vinutha Prashanth

Subject: Python Application Programming/15CS664   **Sem:** VI

Course Objectives:
• Learn Syntax and Semantics and create Functions in Python.
• Handle Strings and Files in Python.
• Understand Lists, Dictionaries and Regular expressions in Python.
• Implement Object Oriented Programming concepts in Python
• Build Web Services and introduction to Network and Database Programming in Python

CO No	Description
At the end of the Course the students will be able to	
C314.1	Examine Python syntax and semantics and be fluent in the use of Python flow control and functions
C314.2	Demonstrate proficiency St handling Strings and Files in Python
C314.3	Create, run and manipulate Python programs using core data structures like Lists, Dictionaries, Tuple and Regular expressions
C314.4	Interpret the concept of Object-Oriented Programming as used in Python and implement exemplary applications related to Network programming, Web Services and Databases in Python.

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
C314.1	3	2			3									
C314.2	3	2			3									
C314.3	3	2			3									
C314.4	3	2	2		3								2	
AVERAGE	3	2	2		3								2	

JUSTIFICATION:

PO No	Justification
PO1	Students will be able to understand the fundamentals of Python Programming language
PO2	Students will be able to identify, formulate the problem using fundamentals of Python programming knowledge
PO3	Students will be able to develop solutions to programming problems by understanding the fundamentals of the Python programming language.
PO5	Students will be able to understand the working of the modern tool(Python ,Eclipse, Liclipse

Sub: DMW
Code: 15CS651

COURSE OUTCOMES & MAPPING

CO No	Description
CO351.1	Able to learn basic concepts of data warehousing and modelling, data cubes, OLAP operations.
CO351.2	Able to understand data mining tasks, challenges, Data mining types and data quality
CO351.3	Able to generate frequent item set and alternative methods for generating frequent item set generation
CO351.4	Apply the techniques of clustering, classification, feature selection and visualization to real world data.

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
1	2								2	1		1		
2	2								2	1		1		
3		3	2						2	1				
4									2	1				
AVG														

CO No	Justification
CO351.1	CO1 → PO1 Covers Engineering knowledge about data warehousing & Modelling CO1 → PO9 → Team work
CO351.2	CO2 → PO2, PO9, PO10, PO12 Covers team work, & Communication through seminar & presentations
CO351.3	CO3 → PO2, PO3, PO9, PO10 Covers problem solving, design and development of algorithms.
CO351.4	CO4 → PO9, PO10 Students are able to work in team and communication skills

HEARTY WELCOME
TO

"Awareness Program on
State Scholarship Portal (SSP)"

For RYMEC Students

Date: 22 November 2019   **Time: 11:00 AM to 1:00 PM**

Venue: CSE Seminar Hall

Resource Persons:

Smt. P.Mamatha	Smt. Sakeena	Sri. Siddappa
Asst Director,Grade -1	District Officer	Taluk extension Officer
Taluk Tribal Welfare office,	Backward Classes	Minority Office,
Dr.B R Ambedkar Bhavan	Devaraj Arasu Bhavan,	Ballari
Ballari	Ballari	

In the gracious presence of

Sri J S Basavaraj	*Sri Aravatagi Prabhu*	*Sri K. M. Shiva Murthy*
Chairman, RYMEC, Ballari.	GB Member, RYMEC, Ballari.	GB Member RYMEC, Ballari.

Dr.K.Veeresh	**Dr.T Hanumantha Reddy**	**Dr. Savita Sonoli**
Principal, RYMEC, Ballari	Vice-Principal, RYMEC, Ballari	Vice-Principal, RYMEC, Ballari

***** *All are cordially invited to participate in the SSP Students awareness program* *****

COURSE OUTCOMES & MAPPING — OS

CO No	Description
CO604.1	To demonstrate the need for OS, different types & structure of the operating systems and outline the core function of the operating system.
CO604.2	To Apply suitable techniques for managing the different resources and compare the algorithms on which the core functions of the operating systems are built
CO604.3	To describe the usage of memory, file system, secondary storage and able to compare and evaluate the algorithms of these core functions of the OS.
CO604.4	To Realize the different concepts of OS in platform of usage through case studies

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
1	2	2												
2	2	2												
3	1	3												
4	1	3			2									
AVG	1.25	2.25			2									

CO No	Justification
CO604.1	Able to **explain (2)**, what Operating system are, **what**(1) they do and **how** (1) they are designed and constructed, **discuss(6)** common features, major components of O.S and Basic organization of computer. -**describe (2)** the services of an O.S provides to users, process and other systems. -**discuss (2)** the various ways of structuring an O.S.
CO604.2	Able to **describe (2)** the process concept, concurrency, process scheduling, inter-process communication (IPC), synchronization and deadlock handling, and **discussion (6)** on threads. -**describe**(2) the various features of processes, including scheduling, creation and termination of processes and processes communication. -**describe (2)** communication in client – server systems. -**What**(1) are multithreaded computer systems? -**discuss (6)** the API for the P-threads. -**describe**(2) the critical section problem to ensure the consistency of shared data, and for both hardware and software critical section problems. -**describe (2)** concurrent processes for completing the tasks, and different

	methods for preventing or avoiding deadlocks in a computer system.
CO604.3	Able to **describe (2)** various ways of organizing memory hardware and **discuss (6)** various memory management techniques, including paging and segmentation, also **describe** benefits of virtual memory system, page replacement algorithms and allocation of page frames. -able to **describe**(2) various ways of organizing memory hardware, address binding, dynamic loading, swapping, sharing and protection. -**describe**(2) the various benefits of virtual memory system, and explain the concept of demand paging, page replacement algorithms, and allocation of page frames. Able to **explain (2)** the functions of file system , secondary storage systems and **discuss (6)** access methods, file sharing, locking, protection. Explain (2) domain access protection.
CO604.4	. **Explore (6)** the history of the UNIX O.S and principles upon which Linux is designed. **Examine**(4) the Linux process model and **illustrate (2)** how Linux schedules processes and provides interprocess communication.

Computer Graphics and Visualization(15CS62)

Course objectives

	At the end of the course Students are able to
C310.1	Design and implement algorithms for 2D graphics primitives and attributes(mod1,mod2)
C310.2	Illustrate Geometric transformations on both 2D and 3D objects.(mod2,mod3)
C310.3	Apply concepts of clipping and visible surface detection in 2D and 3D viewing, and Illumination Models(mod3,mod4)
C310.4	Decide suitable hardware and software for developing graphics packages using OpenGL(mod5)

CO-PO/PSO MAPPING 2017-18 (Odd Sem)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C404.1	3	2	3	2	3									
C404.2		3	3	2	3									
C404.3	2	3	2	2	3									
C404.4	2	2	2	2	3									
AVERAGE	2.3	2.5	2.5	2	3									

*Note: - 1:- Slight (Low)   2:- Moderate (Medium)   3:- Substantial (High).

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

JUSTIFICATION

Students are able to learn the concepts of graphics so CO1 is mapped to PO1(Engg Knowledge)
Able to identify problems so CO1 is mapped to PO2
Able to design solutions for line drawing etc so CO1 is mapped to PO3
Able to conduct investigations of line and circle drawing algorithms so CO1 is mapped to PO4
Able to learn functions in OpenGL CO1 is mapped to PO5.

Able to identify problems so CO2 is mapped to PO2
Able to design solutions for 2D and 3D transformations so CO2 is mapped to PO3
Able to conduct investigations of algorithms so CO1 is mapped to PO4
Able to learn functions in OpenGL CO1 is mapped to PO5.

Students are able to learn the concepts of clipping so CO3 is mapped to PO1(Engg Knowledge)
Able to identify problems so CO3 is mapped to PO2
Able to design solutions for clipping visible surface detection in 2D and 3D viewing, and Illumination Models so CO3 is mapped to PO3
Able to conduct investigations of algorithms so CO3 is mapped to PO4
Able to learn functions in OpenGL CO1 is mapped to PO5.

Students are able to learn the concepts of graphics so CO4 is mapped to PO1(Engg Knowledge)
Able to identify problems so CO4 is mapped to PO2
Able to design solutions so CO4 is mapped to PO3
Able to conduct investigations algorithms so CO4 is mapped to PO4
Able to learn functions in OpenGL CO4 is mapped to PO5

COURSE OUTCOMES & MAPPING

CO No	Description
CO604.1	To understand the fundamental concept of system software such as assemblers, loaders, linkers and macro processors
CO604.2	To understand source file, object file and executable file structures and libraries and also lexical analyzers, parsers
CO604.3	To design and develop lexical analyzers, parsers
CO604.4	To understand and implement code generation

CO	Program Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
CO604.1	3											2		
CO604.2	3	3	3									2		
CO604.3		3	3									2		
CO604.4	3	3	3									2		
AVERAGE	2.5	2.7	3									2		

PO No	Justification
PO1	Applying the knowledge of mathematics, engineering fundamentals, so contribution towards CO1, CO2 and CO4 is more, so weight age given is 3
PO2	Identify and formulate contributes more to the given task, so weight age given for CO2, CO3 and CO4 is 2 ,3&4.
PO3	Design solutions for engineering problems that meet the specified needs with appropriate consideration, weight age given for CO2,3 &4 is 3.

Sub: SS & CD

Staff Name:
1. Sai Madhavi D
2. Sunitha S

COMPUTER GRAPHICS LABORATORY WITH MINI PROJECT(15CSL68)

CO No	Description The students should be able to:
C316.1	Apply the concepts of computer graphics
C316.2	Implement computer graphics applications using OpenGL
C316.3	Animate real world problems using OpenGL

CO	Programme Outcomes												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
C316.1	3	2	3	2	3			2	2	2		2		
C316.2	2	3	3	2	3			2	2	2		2		
C316.3		3	3	3	3			3	3	3	3	2		3
AVG	2.5	2.6	3	2.3	3			2.3	2.3	2.3	3	2		3

SS & CD LAB COURSE OUTCOMES & MAPPING

CO No	Description
C307.1	Design and implement programs using LEX & YACC tools.
C307.2	Evaluate different types of CPU scheduling algorithms used in Operating system.
C307.3	Implement page replacement memory management algorithms.
C307.4	Implement deadlock handling algorithms

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
1	2	2	3		2							2		2
2	3	3	3		2							2		2
3	3	3	3		2							2		2
4	3	3	3		2							2		2
AVG	2.75	2.75	3		2							2		2

CO No	Justification
1	Students are able to learn, Analyse , design and implement the **programs using LEX & YACC tools** so CO1 is mapped to PO1 ,PO2,PO3 , PO5 and PO12.
2	Students are able to **Evaluate different types of CPU scheduling algorithms used in Operating system** so CO1 is mapped to PO1 ,PO2,PO3 , PO5 and PO12.
3	Students are able to **Implement page replacement memory management algorithms** so CO1 is mapped to PO1 ,PO2,PO3 , PO5 and PO12
4	Students are able to **Implement deadlock handling algorithms** CO1 is mapped to PO1 ,PO2,PO3 , PO5 and PO12

USN: 1VE19ES012
Name: SACHIN TN RAJESAB
College: RVCE
Branch: CSE
Date of birth: 2001
E-Mail: sachin@gmail.com

Academic Year 2017-18 EVEN Sem

Staff Name: Pampapathi B M	Sem:VIII	Sec: B
Course Name: Network Management System	Course Code: 10CS834	

COURSE OUTCOMES & MAPPING

CO No	Description
C403.1	Able to understand basic knowledge of computer , telecommunication networks and basic communication architecture
C403.2	Able to identify goals, challenges of network management architecture for LAN,MAN,WAN and protocols used
C403.3	Able to understand and analyze NMS
C403.4	Ability to solve problem related to network management and applications.

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
1	3												3	
2		3							2				3	
3		3											3	
4			3					1					3	
AVG	3	3	3					1	2				3	

SA

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VIII   SA   10IS81

COURSE OUTCOMES 2017-18 (EvenSem)

CO No	Description
C409.1	Able to describe the basics of software architecture and understand architecture styles
C409.2	Able to analyze and design architecture styles and document the system
C409.3	Able to understand system quality attributes and understand how to improve quality attributes
C409.4	Able to understand architecture ,design pattrens

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
1			3		3							2		3
2									3			3		2
3					2				3					3
4					2				3			2		3
AVG			3		2.33				2.66			2.66		2.75

CO No	Justification
1	The content relevance of C409.1 with the PO3, PO5 and PSO2 are high, and PO12 is moderate.
2	The content relevance of C409.2 with the PO9 and PO12 are high and PSO2 is moderate.
3	The content relevance of C409.3 with the PO9 and PSO2 are high, and PO5 is moderate.
4	The content relevance of C409.4 with the PO9 and PSO2 are high, and PO5, and PO12 are moderate.

COURSE OUTCOMES & MAPPING –SOFTWARE TESTING 17-18

CO No	Description
C412.1	Able to understand basic concepts of software testing to identify test cases for the given problem statement
C412.2	Able to understand and apply the various levels of testing in creating an reliable product
C412.3	Able to understand the strategic planning and monitoring for systematic development of software
C412.4	Able to apply the concepts of testing and planning strategies for analysis and solving of real time problems

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
1	1												-----	3
2	1	2	2	3									-----	3
3								3	3	3	3	3	-----	3
4			3									3	-----	3
AVG	1	2	2.5	3				3	3	3	3	3		3

CO No	Justification

Justification for CO-PO Mapping

Course Outcomes	Units	No of Hours	Total No. of Hours per CO's	Total No. of Hours for Course	% contribution
C412.1	I	6	6		11.53
C412.2	II+III+IV+V	7+7+6+7	27	52	51.2
C412.3	VI+VII+VIII	4+3+3	10		38.84
C412.4	VI+VII+VIII	3+3+3	9		17.30

COURSE OUTCOMES & MAPPING –SOFTWARE TESTING 17-18

CO No	Description
C412.1	Able to understand basic concepts of software testing to identify test cases for the given problem statement
C412.2	Able to understand and apply the various levels of testing in creating an reliable product
C412.3	Able to understand the strategic planning and monitoring for systematic development of software
C412.4	Able to apply the concepts of testing and planning strategies for analysis and solving of real time problems

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
1	1												-----	3
2	1	2	2	3									-----	3
3								3	3	3	3	3	-----	3
4			3									3	-----	3
AVG	1	2	2.5	3				3	3	3	3	3		3

CO No	Justification

Justification for CO-PO Mapping

Course Outcomes	Units	No of Hours	Total No. of Hours per CO's	Total No. of Hours for Course	% contribution
C412.1	I	6	6		11.53
C412.2	II+III+IV+V	7+7+6+7	27	52	51.2
C412.3	VI+VII+VIII	4+3+3	10		38.84
C412.4	VI+VII+VIII	3+3+3	9		17.30

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACCREDITED BY NATIONAL BOARD OF ACCREDITATION

Academic Year 2017-18

COURSE OUTCOMES & MAPPING

CO No	Description
C402.1	Able to describe the basics of embedded systems and understand various instructions of ARM processors.
C402.2	Able to analyze and design various embedded system programs.
C402.3	Able to understand the basics of RTOS
C402.4	Able to understand different embedded systems development environments and analyze different simulators used in embedded systems

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
C402.1	2	2	2											
C402.2		3	3	2										
C402.3	1	2	2	2										
C402.4		2	2		3							1		
AVERAGE	1.5	2.25	2.25	2	3							1		

CO	Programme Outcome												Specific Outcome	
	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2
C402.1	33%	33%	34%											
C402.2		35%	35%	30%										
C402.3	10%	30%	30%	30%										
C402.4		25%	25%		35%							15%		
AVERAGE	1.5	2.25	2.25	2	3							1		

Level 1 -5%-18%----------------1
Level 2- 19%-34%----------------2
Level 3 – 35% and above---------3

CO No	Justification
1	PO1 PO2 and PO3 are contributing 33% so Contribution is 2
2	PO2 and PO3 are contributing 33% so Contribution is 3 PO4 are contributing 33% so Contribution is 2
3	PO1 are contributing 10% so Contribution is 1 PO2,3,4 are contributing 30% so Contribution is 2
4	PO2,3 are contributing 25% so Contribution is 2 PO5 are contributing 35% so Contribution is 3 PO12 are contributing 15% so Contribution is 1

COURSE OUTCOMES 2017-18 (Even Sem)

Staff Name: Swetha Ramana / Puneeth.GJ	Semester: 8	Sec: A /B
Course Name: System Modeling & Simulation	Course Code: 10CS82	Total contact hours: 52

COURSE OUTCOME	DESCRIPTION
C410.1	Able to describe the role of important elements of simulation and modeling paradigm.
C410.2	Able to understand the system concept and apply functional modelling method to model the activities of static and dynamic systems.
C410.3	Able to simulate the operation of dynamic stochastic systems and make improvement according to the simulation results.
C410.4	Able to identify the inputs, analyze, verify and validate the output for discrete-event simulation systems.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C410.1	3	3	2			1						1		2
C410.2	3	3	3	3		1				1		1		2
C410.3	3		3	3								1		2
C410.4	2			3								2		2
Average	2.75	3	2.66	3		1				1		1.25		2

(Swetha Ramana.V)
Program Coordinator
(Sign with Date)