St. JOSEPH'S COLLEGE OF ENGINEERING

OMR, CHENNAI-119

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

B.E. ELECTRICAL AND ELECTRONICS ENGINEERING

DETAILS OF COURSE CODE – 2013 REGULATION

I - YEAR

SEMESTER 1

S.NO	SUBJECT CODE	SUBJECT NAME	COURSE CODE
1	HS6151	Technical English I	C101
2	MA6151	Mathematics I	C102
3	PH6151	Engineering Physics - I	C103
4	CY6151	Engineering Chemistry - I	C104
5	GE6151	Computer Programming	C105
6	GE6152	Engineering Graphics	C106
7	GE6161	Computer Practices Laboratory	C107
8	GE6162	Engineering Practices Laboratory	C108
9	GE6163	Physics and Chemistry Laboratory - I	C109

SEMESTER 2

S.NO	SUBJECT CODE	SUBJECT NAME	COURSE CODE
1	HS6251	Technical English – II	C110
2	MA6251	Mathematics - II	C111
3	PH6251	Engineering Physics – II	C112
4	CY6251	Engineering Chemistry – II	C113
5	GE6251	Basic Civil and Mechanical Engineering	C114
6	EE6201	Circuit Theory	C115
7	GE6262	Physics and Chemistry Laboratory – II	C116
8	GE6263	Computer Programming Laboratory	C117
9	EE6211	Electric Circuits Laboratory	C118

II - YEAR

SEMESTER 3

S.NO	SUBJECT CODE	SUBJECT NAME	COURSE CODE
1	MA6351	Transforms and Partial Differential Equations	C201
2	EE6301	Digital Logic Circuits	C202
3	EE6302	Electromagnetic Theory	C203
4	GE6351	Environmental Science and Engineering	C204
5	EC6202	Electronic Devices and Circuits	C205
6	EE6303	Linear Integrated Circuits and Applications	C206
7	EC6361	Electronics Laboratory	C207
8	EE6311	Linear and Digital Integrated Circuits Laboratory	C208

SEMESTER 4

S.NO	SUBJECT CODE	SUBJECT NAME	COURSE CODE
1	MA6459	Numerical Methods	C209
2	EE6401	Electrical Machines – I	C210
3	CS6456	Object Oriented Programming	C211
4	EE6402	Transmission and Distribution	C212
5	EE6403	Discrete Time Systems and Signal Processing	C213
6	EE6404	Measurements and Instrumentation	C214
7	CS6461	Object Oriented Programming Laboratory	C215
8	EE6411	Electrical Machines Laboratory - I	C216

III - YEAR

SEMESTER V

S.No	Subject Code	Subject Name	COURSE CODE
1.	EE6501	Power System Analysis	C301
2.	EE6502	Microprocessors and Microcontrollers	C302
3.	ME6701	Power Plant Engineering	C303
4.	EE6503	Power Electronics	C304
5.	EE6504	Electrical Machines – II	C305
6.	IC6501	Control Systems	C306
7.	EE6511	Control and Instrumentation Laboratory	C307
8.	GE6563	Communication Skills – Laboratory Based	C308
9.	EE6512	Electrical Machines Laboratory – II	C309

SEMESTER VI

S.No	Subject Code	Subject Name	COURSE CODE
1.	EC6651	Communication Engineering	C310
2.	EE6601	Solid State Drives	C311
3.	EE6602	Embedded Systems	C312
4.	EE6603	Power System Operation and Control	C313
5.	EE6604	Design of Electrical Machines	C314
6.	EE6002	Power System Transients	C315
7.	EE6611	Power Electronics and Drives Laboratory	C316
8.	EE6612	Microprocessors and Microcontrollers Laboratory	C317
9.	EE6613	Presentation Skills and Technical Seminar	C318

IV – YEAR

SEMESTER VII

S.No	Subject Code	Subject Name	COURSE CODE
1.	EE6701	High Voltage Engineering	C401
2.	EE6702	Protection and Switchgear	C402
3.	EE6703	Special Electrical Machines	C403
4.	MG6851	Principles of Management	C404
5.	EI6704	Biomedical Instrumentation	C405
6.	EE6008	Microcontroller Based System Design	C406
7.	EE6711	Power System Simulation Laboratory	C407
8.	EE6712	Comprehension	C408
9.	EE6801	Electric Energy Generation, Utilization and Conservation	C409

SEMESTER VIII

S.No	Subject Code	Subject Name	COURSE CODE
1.	EE6801	Electric Energy Generation, Utilization and Conservation	C409
2.	EE6010	High Voltage Direct Current Transmission	C410
3.	GE6075	Professional Ethics in Engineering	C411
4.	EE6811	Project Work	C412

COURSE OUTCOMES (CO)
REGULATION 2013

SEMESTER I

COURSE CODE: C101 **AU CODE/SUBJECT: HS6151 /Technical English - I**

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C101.1	Would have developed communication skills for academic and professional purposes.
C101.2	Would have acquired the ability to speak effectively in English in real-life situations.
C101.3	Would have inculcated reading habit and have developed effective reading skills.
C101.4	To ensure to use the electronic media such as internet and supplement the learning materials used in the classroom.
C101.5	To improve the active and passive vocabulary and to write letters and reports effectively in formal and business situations.

COURSE CODE: C102 **AU CODE/SUBJECT: MA6151 /Mathematics – I**

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C102.1	To develop the use of matrix algebra techniques this is needed by engineers for practical applications.
C102.2	To be knowledgeable in the area of infinite series and their convergence so that he/ she will be familiar with limitations of using infinite series approximations for solutions arising in mathematical modeling.
C102.3	To be familiar with functions of several variables which is needed in many branches of engineering.
C102.4	To know the concepts of improper integrals, Gamma, Beta and Error functions which are needed in engineering applications.
C102.5	To acquaint with mathematical tools needed in evaluating multiple integrals and their usage.

COURSE CODE: C103 **AU CODE/SUBJECT: PH6151/ Engineering Physics -I**

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C103.1	To understand various types of lattices, crystals, graphite and structures.
C103.2	To understand the properties of matter and laws related to them.
C103.3	To understand various theories, time dependent and independent equations.
C103.4	To understand the properties and various applications of ultrasonic waves.
C103.5	To understand the principle of various types of fiber optic cables, sensors, communication systems and their applications and to understand the principle of various types of emission and applications of LASERs.

COURSE CODE:C104 AU CODE/SUBJECT: CY6151/Engineering Chemistry – I

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C104.1	To be conversant with basics of polymer chemistry.
C104.2	To acquire sound knowledge of second law of thermodynamics and second law based derivations of importance in engineering applications in all disciplines.
C104.3	To acquaint with concepts of important photo physical and photochemical processes and spectroscopy.
C104.4	To develop an understanding of the basic concepts of phase rule and its applications to single and two component systems and appreciate the purpose and significance of alloys.
C104.5	To acquaint the students with the basics of nano materials, their properties and applications.

COURSE CODE:C105 AU CODE/SUBJECT: GE6151/ Computer Programming

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C105.1	To know the organization of a digital computer and be exposed to the number systems.
C105.2	Learn to think logically and write pseudo code or draw flow charts for problems and be exposed to the syntax of C.
C105.3	Learn to use arrays and strings in C.
C105.4	Learn to use functions and pointers in C.
C105.5	Learn to use structures and unions in C.

COURSE CODE:C106 AU CODE/SUBJECT: GE6152/Engineering Graphics

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C106.1	To understand and visualize the three dimensional objects and curves used in objects.
C106.2	To understand the projection of points, lines and plane surfaces and determin the true length.
C106.3	To understand the projection of solids such as prisms, pyramids, cylinder and cone.
C106.4	To understand the sections of solids in vertical position at various inclinations and to develop various lateral surfaces of solids.
C106.5	To understand the principles of isometric projection of various solids.

COURSE CODE:C107 AU CODE/SUBJECT: GE6161/Computer Practice Lab–I

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C107.1	To know the basic operations in word like document creation, table creation, formatting and conversion.
C107.2	To do the mail merge and letter preparation and to draw the flow chart.
C107.3	To create various charts and to use formula in formula editor.
C107.4	To use object, picture, graphics and to use sorting functions in spread sheet.
C107.5	To know about the various data types, expression, condition, arrays, structures and unions.

COURSE CODE:C108 AU CODE/SUBJECT: GE6162/Engineering Practices Laboratory

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C108.1	Abe to comprehend the concept of wiring with the help of various electrical elements.
C108.2	Abe to understand the working principle of Fluorescent Lamp by appropriate connection of elements.
C108.3	Abe to analyze the concept of functioning of a bulb whose control is at two different places.
C108.4	Abe to know the measurement of basic electrical quantities and the devices required for their measurements.
C108.5	Abe to comprehend the purpose of earthing of electrical equipment.

COURSE CODE:C109 AU CODE/SUBJECT: GE6163/ Physics and Chemistry Laboratory - I

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C109.1	To test basic understanding of physics concepts applied in optics, thermal physics and properties of matter and to determine Young's modulus of the material for uniform and non-uniform bending.
C109.2	To determine specific resistance of a given coil and viscosity of the liquid.
C109.3	To determine Spectrometer dispersive power of a prism.
C109.4	To acquire practical skills in the determination of water quality parameters through volumetric and instrumental analysis.
C109.5	To acquaint the students with the determination of molecular weight of a polymer by vacometry.

SEMESTER II

COURSE CODE:C110 AU CODE/SUBJECT: HS6251/Technical English – II

Enlistment of Course Outcomes:

Learners should be able to

Course Outcomes	STATEMENT
C110.1	Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, argue using appropriate communicative strategies.
C110.2	write effectively and persuasively and produce different types of writing such as narration,
C110.3	description, exposition and argument as well as creative, critical, analytical and evaluative writing.
C110.4	read different genres of texts, infer implied meanings and critically analyse and evaluate them for ideas as well as for method of presentation.
C110.5	listen/view and comprehend different spoken excerpts critically and infer unspoken and implied meanings.

COURSE CODE:C111 **AU CODE/SUBJECT: MA6251/Mathematics – II**

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C111.1	To apply the concepts of curl, divergence and basic theorems in vector calculus in cubes and rectangular parallelepipeds.
C111.2	To find the solution for first order and higher order differential equations with constant coefficients.
C111.3	To understand the Laplace transforms and their properties and their application in test signals, theorems and solutions in linear ODE with constant coefficients.
C111.4	To know the functions of complex variable and construct analytic functions and apply bilinear transformation
C111.5	To do the complex integration by using Cauchy's theorems and formula, Taylor and Laurent's expressions and residue theorem.

COURSE CODE:C112 **AU CODE/SUBJECT: PH6251/Engineering Physics – II**

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C112.1	Able to understand the conductors in metals using classical theory and quantum theory .
C112.2	Able to understand semiconductors , their properties and conductivity. Apply it to determine their band gap, variation of Fermi level with temperature for extrinsic and intrinsic semiconductors. Apply hall effect to identify the type of semiconductors.
C112.3	Able to understand the properties of different types of magnetic materials – Diamagnetic, Paramagnetic, Ferromagnetic, Antiferromagnetic,Ferrites. Understands the phenomenon of superconductivity, its types and properties of superconductors and applications in SQUID, Cyrotron and magnetic levitation.
C112.4	Able to understand the properties of dielectric materials, various types of polarization and loss in dielectric materials. Apply the properties of dielectrics in fabrication of capacitors and transformer cores.
C112.5	Able to understand the different types of materials, metallic glass, SMA , Nanomaterials and CNT. Their properties and fabrication and apply to develop alloys of various composition with desirable properties.

COURSE CODE:C113 AU CODE/SUBJECT: CY6251/Engineering Chemistry – II

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C113.1	Able to understand about the boiler feed water, scale deposits in boilers, sludge formation in boilers, boiler corrosion, caustic embrittlement, priming and foaming, internal and external treatment of water and desalination process
C113.2	Able to understand the concept of Electrochemical cell, origin of electrode potential, electrochemical series and its significance, Nernst equation ,corrosion and its types, prevention of corrosion – sacrificial anode method ,impressed current method, paints ,electroplating and electroless plating
C113.3	Able to understand the concept of nuclear energy, nuclear fission and fusion, nuclear reactor and its types, storage devices like solar cells ,wind energy and batteries.
C113.4	Able to understand the concept of abrasives and its types, refractories, properties of refractories, preparation and properties of cement and glass.
C113.5	Able to understand the concept of classification of fuels, analysis of coal, manufacture of metallurgical coke, manufacture of synthetic petrol, fractional distillation of petroleum, preparation and properties of natural gas, compressed natural and flue gas analysis.

COURSE CODE: C114 AU CODE/SUBJECT: GE6251/ Basic Civil & Mechanical Engineering

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C114.1	To understand the types, classifications and principles of surveying and to know civil engineering materials.
C114.2	To understand the types, bearing capacity of foundations, types of masonry, bridges, dams and their design and landscapes.
C114.3	To understand the various types of power plants.
C114.4	To understand the various types of IC engines.
C114.5	To understand the principle of vapour compression and absorption in refrigeration and air conditioning.

COURSE CODE: C115 AU CODE/SUBJECT: EE6201/ Circuit Theory

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C115.1	To understand the connections of resistors, basic circuit laws and their application in mesh and nodal analysis.
C115.2	To understand the network reduction techniques and various theorems for a.c. and d.c. circuits.
C115.3	To understand the types of resonance, coupling factor, bandwidth and quality factor in couple circuits.
C115.4	To understand the transient response for various dc circuits.
C115.5	To understand the balanced and unbalanced sources, types of loads and power and power factor measurements in three phase circuits.

COURSE CODE:C116 AU CODE/SUBJECT: GE6262/ Physics and Chemistry Laboratory – II
Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C116.1	Able to understand the thin film interference and diffraction types. Able to understand the concept of temporary hardness, permanent hardness and total hardness by using EDTA.
C116.2	Able to understand the concept about the basic properties of matter like stress, strain and types of modulii. Able to understand the concept about the amount and various types of alkalinity present in the given water sample..
C116.3	Able to understand the concept of optics like reflection, refraction , diffraction by using spectrometer prism. Able to understand the concept about the amount of copper present in brass.
C116.4	Able to understand the concept of coefficient of viscosity of the liquids. Able to understand the concept of determining the strength of given substance by precipitation titration using conductivity meter.
C116.5	Able to understand the concept about the basic properties of matter like stress, strain and types of modulii. Able to understand the concept of emf and finding the emf values by using potentiometer.

COURSE CODE: C117 AU CODE/SUBJECT: GE6263/ Computer Programming Laboratory
Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C117.1	To have a basic knowledge in Unix OS, basic shell commands and Unix editor.
C117.2	To do basic operations in shell program.
C117.3	To do programs in conditional, loops and tests.
C117.4	To have a basic knowledge in dynamic storage allocation.
C117.5	To do programs in pointers, functions and file handling.

COURSE CODE: C118 AU CODE/SUBJECT: EE6211/Electric Circuits Laboratory
Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C118.1	Able to understand and experimentally verify the electric circuit laws.
C118.2	Able to identify network theorems and their application to network reduction techniques.
C118.3	Analyze the response characteristics of resonant circuits and passive filters
C118.4	Analyze the single and three phase electric networks and study the instruments used for commercial measurement of electrical power.
C118.5	Study the two port networks and determine their parameters.

SEMESTER III

COURSE CODE: C201 AU CODE/SUBJECT: MA6351/Transforms and Partial Differential Equations

Enlistment of Course Outcomes:

On completion of this course, the students will be

Course Outcomes	STATEMENT
C201.1	Able to form the partial differential equations, find the solutions of first order partial differential equations and higher order linear partial differential equations with constant coefficients
C201.2	Able to expand the periodic function as a general form and complex form of Fourier series. They can also find the Fourier series through harmonic analysis for discrete values of the function are given.
C201.3	Able to classify the partial differential equations. They can find the solutions to one dimensional wave equation, one dimensional and two dimensional heat conduction problems
C201.4	Able to find the Fourier transform and inverse Fourier transform of the function. They can understand the concepts of convolution theorem and Parseval's identity on fourier transform. They can also evaluate the certain type of integrals using Fourier transform technique.
C201.5	Able to find the Z-transform of sequence and inverse Z-transform of function. They can form the difference equations and solving them using Z-transforms technique.

COURSE CODE: C202 AU CODE/SUBJECT: EE6301/Digital Logic Circuits

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C202.1	To understand about the various number systems and its application in digital design
C202.2	To compare the performance characteristics of various logic families
C202.3	To understand, analyze and design combinational and sequential circuits.
C202.4	To identify and prevent various hazards and timing problems in a digital design and propose a cost effective solution.
C202.5	To introduce digital simulation for development of application oriented logic circuits.

COURSE CODE: C203 AU CODE/SUBJECT: EE6302 /Electromagnetic Theory

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C203.1	Understand the basics of vector algebra, vector calculus and orthogonal co-ordinate systems to analyze and understand the electromagnetic field concepts.
C203.2	To understand and compute electrostatics field, potential and energy for designing and finding solution for various electrical and electronics engineering problems.
C203.3	To understand and compute magnetostatic field, potential and energy for designing and finding solution for various electrical and electronics engineering problems.
C203.4	Understanding the various laws and concepts governing the combined electromagnetic field and their applications in finding solutions to combinatorial engineering problems.
C203.5	Understanding the fundamentals Concepts of electromagnetic wave propagation in various medium and its application in designing wave guides and transmission lines.

COURSE CODE: C204 AU CODE/SUBJECT: GE6351/Environmental Science and Engineering

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C204.1	Define Environment, ecosystem and biodiversity, classify types of ecosystems and outline the impacts to biodiversity.
C204.2	Define pollution, classify its types, analyze the causes and suggest control measures for pollution.
C204.3	Outline various natural resources; explain causes and impacts of destruction of resources.
C204.4	List various social issues related to land, water and energy; summarize the concerning government acts and rules to overcome these problems.
C204.5	Interpret population explosion and variation among nations, show the impacts of over population and illustrate the methods to mitigate the same.

COURSE CODE: C205 AU CODE/SUBJECT: EC6202/Electronic Devices and Circuits

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C205.1	An ability to understand the essence of the diode functions, grasp the techniques for the analysis of diode circuits and use diodes for various application
C205.2	An ability to develop a high degree of familiarity with the BJT, JFET,MOSFET, THYRISTOR,IGBT: its physical structure and operation terminal characteristics, circuit models.
C205.3	An ability to analyze the BJT terminal characteristics, utilize the circuit models to perform the rapid first-order analysis of BJT circuits and to design single-stage BJT amplifiers, analyze and design the basic discrete MOSFET circuits.
C205.4	An ability to analyze the modes of differential amplifiers, multistage amplifiers, and develop familiarity with the neutralisation methods and types of power amplifiers.
C205.5	An ability to define and analyze the four basic amplifiers models (voltage, current, transconductance and transresistance). Solve the amplifier's transfer functions and gain.

COURSE CODE: C206 AU CODE/SUBJECT: EE6303/ Linear Integrated Circuits and Applications

Enlistment of Course Outcomes:

On successful completion of this course, the student will be able to

Course Outcomes	STATEMENT
C206.1	Explain and Illustrate the fabrication of electronic devices and ICs.
C206.2	Discuss the op-amp's basic construction, characteristics, various configuration and countless applications of op-amp.
C206.3	Analyze and design basic op-amp circuits, particularly various linear and non-linear circuits, active filters, signal generators, and data converters.
C206.4	Design a timer, PLL, analog multiplier and VCO circuit as per specifications.
C206.5	Choose and design a Switched mode and Linear power supply.

COURSE CODE: C207 AU CODE/SUBJECT: EC6361/ Electronics Laboratory

Enlistment of Course Outcomes:

On successful completion of this course, the student will be able to

Course Outcomes	STATEMENT
C207.1	Able to understand the characteristics of semiconductor diode and their simple applications.
C207.2	Able to understand the characteristics of Transistor under different configuration
C207.3	Able to understand the operation of various power electronic converters
C207.4	Able to understand and design different types of Oscillators, Amplifier,filter
C207.5	Able to understand the operation of Astable and Monostable multivibrators and CRO

COURSE CODE:C208 AU CODE/SUBJECT: EE6311/ Linear and Digital Integrated Circuits Laboratory

Enlistment of Course Outcomes:

On successful completion of this course, the student will be able to

Course Outcomes	STATEMENT
C208.1	Design and implement combinational circuits(Adder, Substractor, Code convertors, Mux, Demux)
C208.2	Design and implement Asynchronous sequential circuits (Asynchronous counter)
C208.3	Design and implement Synchronous sequential circuits (Synchronous counter)
C208.4	Design and implement the linear circuits using OP-AMP (IC 741).
C208.5	Design and implement the f linear electronic circuits using Timer (IC 555) .

SEMESTER IV

COURSE CODE: C209 AU CODE/SUBJECT: MA6459/ Numerical Methods

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C209.1	The roots of nonlinear (algebraic or transcendental) equations, solutions of large system of linear equations and eigen value problem of a matrix can be obtained numerically where analytical methods fail to give solution.
C209.2	When huge amounts of experimental data are involved, the methods discussed on interpolation will be useful in constructing approximate polynomial to represent the data and to find the intermediate values.
C209.3	The numerical differentiation and integration find application when the function in the analytical form is too complicated or the huge amounts of data are given such as series of measurements, observations or some other empirical information.
C209.4	Since many physical laws are couched in terms of rate of change of one/two or more independent variables, most of the engineering problems are characterized in the form of either nonlinear ordinary differential equations or partial differential equations.
C209.5	The methods introduced in the solution of ordinary differential equations and partial differential equations will be useful in attempting any engineering problem.

COURSE CODE: C210 AU CODE/SUBJECT: EE6401/ Electrical Machines – I

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C210.1	Able to analyze the magnetic circuits & Calculate the induced EMF and understand the properties of magnetic materials.
C210.2	Able to understand the working of Transformer and analyze the operation of transformer in different loading condition
C210.3	Able to understand & analyze the concept of field energy and co-energy in single and multiple excited systems
C210.4	Understand the construction of D.C machines and operation of DC Generator
C210.5	Understand the operation of DC motor, Starting and speed control of DC motor, analyze the characteristics of dc motor & the braking system

COURSE CODE: C211 AU CODE/SUBJECT: CS6456/ Object Oriented Programming

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C211.1	Gain the basic knowledge on Object Oriented concepts in C++.
C211.2	Ability to develop applications using Object Oriented Programming Concepts.
C211.3	Ability to implement features of advanced programming to solve real world problems.
C211.4	Gain the basic knowledge on concepts in Java.
C211.5	Ability to implement features of exception handling.

COURSE CODE: C212 AU CODE/SUBJECT: EE6402/Transmission and Distribution

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C212.1	Explain the modern structure of power systems, a.c. and d.c. distributors, a.c. and d.c. transmission and operation of FACTS.
C212.2	Arrive the expressions for transmission line parameters and to know the application of GMD and GMR for various conductor configurations and explain the various effects of alternating current in conductors.
C212.3	Obtain the equivalent circuit based on distance and operating voltage for determining voltage regulation and efficiency and also to know the methods of improvement of voltage profile along with real and reactive power flow in transmission lines with the help of power circle diagrams.
C212.4	Know the types of insulator and cables and to analyze the voltage distribution, methods of improvement string efficiency and grading of cables.
C212.5	Develop the mechanical design of transmission lines with sag and tension calculation for different weather conditions and to know about tower spotting techniques along with substations and methods of grounding.

COURSE CODE: C213 AU CODE/SUBJECT: EE6403/Discrete Time Systems And Signal Processing

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C213.1	Classify the different types of signals and systems and explain the sampling process of continuous time signal.
C213.2	Apply z-transform and inverse Z transform and analyze discrete time systems.
C213.3	Apply Radix-2 Decimation in Time (DIT) and Decimation in Frequency (DIF) FFT Algorithm to Compute Discrete Fourier Transform.
C213.4	Explain different types of Infinite Impulse Response (IIR) filters and Finite Impulse Response (FIR) filters.
C213.5	Explain various architectures of Digital signal processors.

COURSE CODE: C214 AU CODE/SUBJECT: EE6404/Measurements and Instrumentation

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C214.1	The student will be able to have a clear knowledge of the basic laws governing the operation of the instruments, relevant circuits and their working. Also general instrument system, error, calibration will be obtained.
C214.2	Able to understand the analog and digital techniques used to measure voltage, current, energy and power etc.
C214.3	Able to have an adequate knowledge of comparison methods of measurement.
C214.4	Able to have adequate knowledge about storage & display devices.
C214.5	Able to have exposure in various transducers and data acquisition system.

COURSE CODE: C215 AU CODE/SUBJECT: CS6461/ Object Oriented Programming Laboratory

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C215.1	To develop programming skills like Function overloading, Simple class design and Template design in C++
C215.2	To develop programming skills like Operator overloading, friend functions, Overloading assignment operator, type conversions, Inheritance, run-time polymorphism.
C215.3	To develop programming skills in I/O, Throwing and Catching exceptions
C215.4	To develop programming skills in Simple class designs, Designing Packages, Interfaces and Inheritance in Java
C215.5	To develop programming skills in Exceptions handling, I/O and Design of multi-threaded programs in Java.

COURSE CODE: C216 AU CODE/SUBJECT: EE6411/Electrical Machines - I Laboratory

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C216.1	To develop programming skills like Function overloading, Simple class design and Template design in C++
C216.2	To develop programming skills like Operator overloading, friend functions, Overloading assignment operator, type conversions, Inheritance, run-time polymorphism.
C216.3	To develop programming skills in I/O, Throwing and Catching exceptions
C216.4	To develop programming skills in Simple class designs, Designing Packages, Interfaces and Inheritance in Java
C216.5	To develop programming skills in Exceptions handling, I/O and Design of multi-threaded programs in Java.

SEMESTER V

COURSE CODE: C301 AU CODE/SUBJECT: EE6501/Power System Analysis

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C301.1	Able to design per phase and per unit model of power system components and to compute the network matrices for the power system studies
C301.2	To formulate power flow equation in polar and rectangular coordinates and to apply numerical iterative techniques to arrive the power flow solution.
C301.3	To categorize different types of faults in power systems and to analyze symmetrical faults using Thevenins theorem and bus impedance matrix
C301.4	To model and analyze unsymmetrical faults in power systems using Fortescue's theorem.
C301.5	Able to understand and analyses the power system stability problems and to get the solution using numerical integration based methods

COURSE CODE: C302 AU CODE/SUBJECT: EE6502/ Microprocessors and Microcontrollers

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C302.1	Understand the hardware structure, pin details, interrupt structure,I/O ports, c, memory organizations of 8085 processors and how to draw timing diagram for 8085 instruction
C302.2	Understand the addressing modes and instruction set of 8085 μP and programming in 8085
C302.3	Understand the hardware structure, pin details, interrupt structure, I/O ports, data transfer concept, memory organizations of 8051microcontroller
C302.4	Understand the architecture, organizations, interfacing with ICs 8255, 8259, 8279, 8237, 8251, A/D,D/A converters with 8085 and 8051.
C302.5	Understand the programming in 8051 microcontroller and its applications

COURSE CODE: C303 AU CODE/SUBJECT: ME6701/ Power Plant Engineering

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C303.1	To know the layout of modern coal power plant and its major components, Binary Cycles and Cogeneration systems.
C303.2	To understand the concept of Otto, Diesel, Dual & Brayton Cycle - Analysis & Optimisation and Components of Diesel and Gas Turbine power plants.
C303.3	To know Basics of Nuclear Engineering, Layout and subsystems of Nuclear Power Plants, Working of Nuclear Reactors : Boiling Water Reactor (BWR), Pressurized Water Reactor (PWR), CANada DeuteriumUranium reactor (CANDU), Breeder, Gas Cooled and Liquid Metal Cooled Reactors. Safety measures for Nuclear Power plants.
C303.4	To study the concept Hydro Electric Power Plants – Classification, Typical Layout and associated components including Turbines. Principle, Construction and working of Wind, Tidal, Solar Photo Voltaic (SPV), Solar Thermal, Geo Thermal, Biogas and Fuel Cell power systems.
C303.5	To understand the concept of Power tariff types, Load distribution parameters, load curve, Comparison of site selection criteria, relative merits & demerits, Capital & Operating Cost of different power plants. Pollution control technologies including Waste Disposal Options for Coal and Nuclear Power Plants.

COURSE CODE: C304 AU CODE/SUBJECT: EE6503/ Power Electronics

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C304.1	Able to appreciate the importance of power electronics devices for high voltage applications by understanding the concepts of various power electronics switches.
C304.2	To learn the basic concepts of operation of single-phase and three-phase thyristor converters in steady state in continuous and discontinuous modes and be able to analyze basic converter topologies.
C304.3	Ability to Analyze, simulate and design DC - DC converters and understand their applications.
C304.4	Ability to Analyze, simulate and design DC - AC converters and understand different pulse width modulation techniques.
C304.5	Ability to understand the concepts of AC-AC converters, single phase and three phase cyclo converters and matrix converters

COURSE CODE: C305 AU CODE/SUBJECT: EE2302/ Electrical Machines II

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C305.1	Draw the constructional details and explain the performance of salient and non – salient type synchronous generators.
C305.2	Draw and explain the Principle of operation and performance of synchronous motor
C305.3	Draw and describe the construction, principle of operation and performance of induction machines.
C305.4	Describe the starting and speed control of three-phase induction motors.
C305.5	Explain the construction, principle of operation and performance of single phase induction motors and special machines.

COURSE CODE: C306 AU CODE/SUBJECT: IC6501/ Control Systems

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C306.1	An ability to understand the basic control systems, classification and mathematical modeling of the physical systems, and reduction of block diagram and signal flow graph representations. To develop the capabilities to convert the physical system into equations and to reduce the complex systems into simpler system.
C306.2	An ability to understand the time domain parameters such as input signal, error, characteristics, root locus design to analyze the stability and traditional controllers such as P/PI/PID design. This helps to attain the basic knowledge regarding the time domain related controller design and its analysis.
C306.3	An ability to analyze the system in frequency domain using the analytical approach as well as the graphical approaches, such as Bode plot, Polar plot, M and N Circles. This also helps to understand the correlation between the time and frequency domain and the design of compensators.
C306.4	An ability to analyze the stability of the system using the procedures, such as Routh array, Nyquest criterion, and the Lead, Lag, Lead-Lag compensators using Bode plot. This helps to attain the knowledge related to the compensator design and its stability analysis in time as well as frequency design.
C306.5	An ability to define and analyze the concept of state variables, State models for linear and time invariant Systems, Solution of state and output equation in controllable canonical form , Concepts of controllability and observability, Effect of state feedback. Which helps understand the conversion of the SISO system into MIMO and vice-versa.

COURSE CODE: C307 AU CODE/SUBJECT: EE6511/ Control and Instrumentation Laboratory

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C307.1	To provide strong foundation in basic science and mathematics necessary to formulate, solve and analyze Control and Instrumentation problems
C307.2	To provide good knowledge of Instrumentation systems and their applications.
C307.3	To provide necessary foundation on computational platforms and software applications related to the respective field of engineering.
C307.4	Able to understand the modeling and stability of an Electrical, Electronics and other physical systems.
C307.5	To be aware of various types of measurements, requirement of calibrations, errors in measurement and to perform accurate measurements for any engineering system.

COURSE CODE: C308 AU CODE/SUBJECT: GE6674/ Communication Skills Laboratory Based

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C308.1	Good command over English language and excel in career development.
C308.2	Ability to make presentations and participate in Debate and Group Discussion.
C308.3	Ability to answer questions during job interviews.
C308.4	Ability to improve reading skills ,writing skillsand speaking skills in English language using IT tools.
C308.5	Ability to improve vocabulary,grammar and analytical skills

COURSE CODE: C309 AU CODE/SUBJECT: EE6512/ Electrical Machines Laboratory – II

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C309.1	By conducting armature resistance test, open circuit test, short circuit test and ZPF test predetermine the different methods of voltage regulation of non salient pole type alternator.
C309.2	By conducting slip test predetermine the voltage regulation of salient pole type alternator.
C309.3	By conducting suitable test determine the impedances of an alternator.
C309.4	For variable field excitation plot the v and inverted v curves of an synchronous motor.
C309.5	Determine and predetermine the performance of single phase and three phase induction motors, calculate the equivalent circuit parameters and study of different types of A.C starters.

SEMESTER VI

COURSE CODE: C310 AU CODE/SUBJECT: EC6651/ Communication Engineering

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C310.1	To introduce different methods of analog communication and their significance
C310.2	To introduce Digital Communication methods for high bit rate transmission
C310.3	To introduce the concepts of source and line coding techniques for enhancing rating of transmission of minimizing the errors in transmission
C310.4	To introduce MAC used in communication systems for enhancing the number of users.
C310.5	To introduce satellite and optical communication

COURSE CODE: C311 AU CODE/SUBJECT: EE6601/ Solid State Drives

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C311.1	Understand the various types of drives, load torque characteristics and Apply the multi quadrant dynamics in hoist load system.
C311.2	Analyze the operation of steady state analysis of single phase and three phase fully controlled converter and Chopper fed separately excited dc motor drives and discuss the various control strategies of converter.
C311.3	Understand the operation and characteristics of various methods of speed control of converters fed induction motor drives.
C311.4	Understand the operation and performance of Synchronous motor and permanent magnet synchronous motor drives
C311.5	Design a current and speed controller for a closed loop solid state DC motor drives and develop the transfer function for DC motor, load and converter.

COURSE CODE: C312 AU CODE/SUBJECT: EE6602/ Embedded Systems

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C312.1	Analyze the basic build process of embedded systems, structural units in embedded Processor and selection of processor and memory devices depending upon the applications.
C312.2	Classify the types of I/O device ports and buses and different interfaces for data transfer.
C312.3	Model the Embedded Product Development Life Cycle (EDLC) by using Different techniques like state machine model, sequential program model and concurrent model and also their by identifying the issues in the embedded system Design.
C312.4	Analyze about the basic concept of Real Time Operating Systems and plan to scheduling of different task and compares the features of different types of Real Time Operating Systems
C312.5	Apply the knowledge of programming concepts of Embedded Systems for various applications like Washing Machine automotive and Smart Card System applications

COURSE CODE: C313 AU CODE/SUBJECT: EE6603/ Power System Operation and Control
Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C313.1	Analyze the various load characteristics, load forecasting methods and to understand the operation of power plant.
C313.2	Understand the modeling of power-frequency dynamics and design power-frequency controller
C313.3	Explain the interaction between reactive power and voltage and the various control methods.
C313.4	Solve economic dispatch problems and unit commitments problems in power systems
C313.5	Explain the need of computer controls to energy management using SCADA and its application for real time operation and control

COURSE CODE: C314 AU CODE/SUBJECT: EE6604/ Design of Electrical Machines
Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C314.1	Able to appreciate the importance of Electrical Engineering materials, Magnetic, thermal and electric loadings.
C314.2	Understand the concepts of magnetic equivalent circuit and will be able to develop the magnetic equivalent circuit and to understand and analyses the complete design procedure of DC Machine.
C314.3	Ability to understand and analyse the complete design procedure of 1Φ and 3Φ transformer and its cooling tank arrangements.
C314.4	Students will be able to understand, evaluate the design procedures related to 3Φ Induction Motor.
C314.5	Stator and rotor design of synchronous machines, analyze their thermal behavior, design of field systems for turbo alternators.

COURSE CODE: C315 AU CODE/SUBJECT: EE6002/ Power System Transients
Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C315.1	Able to design and analyze the response of electrical circuit transients comprising R, L, C and to extend this knowledge to understand the transient behavior of the real time power system.
C315.2	Able to analyze the resistance and load switching, the normal and abnormal switching circuits understand the consequences of switching transients in power system networks.
C315.3	To acquire a comprehensive knowledge about lightning discharges and its impact on power system components to design protection circuits.
C315.4	Ability to model the transmission line and to understand the wave propagation of voltage and current for different excitations. To analyze the transient behavior of a transmission line with the use of Bewley's lattice diagram
C315.5	Able to understand the transient response of a power system for the various types of faults on integrated power systems and also know the basic design and simulation of transient computations using EMTP.

COURSE CODE: C316 AU CODE/SUBJECT: EE6611/ Power Electronics and Drives Laboratory

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C316.1	Able to understand and analyse different types of power semiconductor devices and their switching characteristics.
C316.2	Able to analyse and understand the operation and characteristics of controlled rectifiers
C316.3	Able to analyse and understand the operation, switching techniques and basics topologies of DC-DC switching regulators.
C316.4	Able to analyse and understand the different modulation techniques of pulse width modulated inverters and AC voltage controller and various configurations.
C316.5	Able to analyse and simulate the different types of power converter circuits

COURSE CODE: C317 AU CODE/SUBJECT: EE6612/ Microprocessors and Microcontrollers Laboratory

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C317.1	To perform simple arithmetic and logical operations using 8085 Microprocessor and 8051 Microcontrollers.
C317.2	To perform simple program using control flow instructions of 8085 Microprocessors and 8051 Microcontrollers.
C317.3	To perform interfacing program using 8085 Microprocessor and 8051 Microcontrollers
C317.4	To study simple program of 8085 Microprocessor and 8051 Microcontrollers using simulator and emulator tools.
C317.5	To develop Mini Projects using 8085 Microprocessor and 8051 Microcontrollers.

COURSE CODE: C318 AU CODE/SUBJECT: EE6613/ Presentation Skills and Technical Seminar

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C318.1	To develop the communication skills by presenting seminar on engineering topic.
C318.2	To develop the soft skills by involving in activities like group discussion and team presentation.
C318.3	To develop the problem solving skills by grouping according to IQ.
C318.4	To act as a team player and to manage the team under any risky conditions.
C318.5	To improve the confidence by facing challenges from the crowd as well as from the individuals.

SEMESTER VII

COURSE CODE: C401 AU CODE/SUBJECT: EE6701/ High Voltage Engineering

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C401.1	Able to understand the sources and effects of switching surges, lightning and temporary over voltages, corona and its effects in power systems, various protection mechanisms against overvoltage. Able to understand and analyze the reflection and refraction of traveling waves in power systems.
C401.2	Able to understand the nature of various breakdown mechanisms in gas, liquid and solid dielectrics.
C401.3	Able to understand and analyze the various methods of generating high voltage AC, DC and impulse voltages and currents.
C401.4	Able to understand and analyze the various methods of measuring high voltage AC, DC and impulse voltages and currents.
C401.5	Able to understand and analyze the various methods of testing insulators,circuit breakers, bushings, Isolators and transformers, insulation coordination.

COURSE CODE: C402 AU CODE/SUBJECT: EE6702/Protection and Switchgear

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C402.1	To understand the basic concepts of protection such as need for protection, nature and causes of faults, quality of protection and schemes in protection.
C402.2	To understand and explain the basic operating principles of electromagnetic relays, universal torque equation of relays and their types.
C402.3	To understand the protection of various apparatus like CT, PT, transformer, motor, generator and busbar and also to analyse their (CT&PT) importance in protection.
C402.4	To realise the synthesis of various relays using static comparators and numerical relays
C402.5	To visualise the physic of arcing phenomenon, circuit breaking and to understand the basic construction and working of various circuit breakers.

COURSE CODE: C403 AU CODE/SUBJECT: EE6703/Special Electrical Machines

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C403.1	Able to understand the concepts, working and applications of synchronous reluctance motor and their types.
C403.2	To Understand the construction, working of different types of stepper motor and to analyse the complete drive system for the motor operation
C403.3	Able to understand the concepts, working and applications of switched reluctance motor and their types and different converter control configuration.
C403.4	To Analyze and understand the design aspects, construction, principle of operation, applications, methods of speed control of permanent magnet brushless DC motor.
C403.5	Analyze and understand the design aspects, construction and principle of operation, applications and methods of speed control of permanent magnet synchronous motor.

COURSE CODE: C404 AU CODE/SUBJECT: MG6851/Principles of Management

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C404.1	Provide an overview of the theory and practices of management and understand the role, characteristics and skills of a supervisor
C404.2	Ability to understand the characteristics skills and the principles of planning and decision making under different situations
C404.3	Ability to understand the steps in organizing and gives an overview about the career development and interview process
C404.4	Ability to understand the concepts of leadership and motivation theories and improvement of communication skills
C404.5	Ability to understand the budgetary and non-budgetary control techniques and various controls in the management

COURSE CODE: C405 AU CODE/SUBJECT: EI6704/Bio Medical Instrumentation

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C405.1	Understand the physiological systems and also the various components of a biomedical system.
C405.2	Understand the techniques and instruments used to measure blood pressure, cardiac output, blood pH and various pulmonary function measurements.
C405.3	Understand the working of different electrodes used to sense bio signals, know about the electrical safety in biomedical measurement, and also about electrical parameter acquisition.
C405.4	Understand the techniques for imaging such as CT scan, MRI, fluoroscopic and radiographic techniques.
C405.5	Understand the working of various life assisting devices.

COURSE CODE: C406 AU CODE/SUBJECT: EE6008/ Microcontroller Based System Design

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C406.1	Able to understand the architecture of PIC 16X and 17x series with its memory considerations, file structures, addressing modes and instruction sets.
C406.2	To learn the concepts of interrupts and its types with its timer programming and to analyse the soft key with its switch mechanism and display of strings.
C406.3	To understand the concept of buses like Inter-integrated circuit bus,SPI and peripheral interfacing like ADC,DAC and data handling circuit.
C406.4	To analyse the ARM architecture with its model and development tools and to understand the concept of addressing modes with its instruction sets and memory considerations
C406.5	To learn the pipeline organization of ARM processors along with ARM application programs

COURSE CODE: C407 AU CODE/SUBJECT: EE6711/Power System Simulation Lab

Enlistment of Course Outcomes:

The students will be able

Course Outcomes	STATEMENT
C407.1	To develop simple C programs for the following basic requirements: a) Formation of bus admittance and impedance matrices and network solution.
C407.2	To understand the concepts of power flow solution of small systems using simple method, Gauss-Seidel P.F. method, Unit Commitment and Economic Dispatch.
C407.3	To arrive the solutions through the standard algorithms and researches available and to confirm the same by implementing in the modern software packages available.
C407.4	To acquire experience in the usage of standard packages for the following analysis / simulation / control functions. a) Steady-state analysis of large system using NRPF methods. b)Quasi steady-state (Fault) analysis for balanced and unbalanced faults.
C407.5	To learn the basics of transient stability and Load Frequency dynamics and to check the same in the simulation of multimachine power system for effective control of power system.

COURSE CODE: C408 AU CODE/SUBJECT: EE6712/Comprehension

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C408.1	To provide strong foundation in basic science and mathematics necessary to formulate, solve and analyze electrical and electronics engineering problems.
C408.2	To provide good knowledge on application oriented electrical and electronics subjects.
C408.3	To provide necessary foundation on problem solving ability related to the electrical and electronics field of engineering.
C408.4	Able to understand the real time problems in Electrical and Electronics systems.
C408.5	To be aware of various types of questions asked in competitive exams and corresponding job opportunities.

SEMESTER VIII

COURSE CODE: C409 AU CODE/SUBJECT: EE6801/Electric Energy Generation Utilisation and Conservation

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C409.1	Students can able to understand and analyze the various concepts behind renewable energy resources, selection and application of electric drives for electric Traction.
C409.2	Students can able to understand the energy saving concept by different ways of illumination.
C409.3	Students can Understand the knowledge on different methods of electric heating and electric welding.
C409.4	Students can understand the basic concepts of Solar Radiation and Solar Energy Collectors
C409.5	Able to Understand the basic concepts of Wind Energy conversion and its utilization

COURSE CODE: C410 AU CODE/SUBJECT: EE6010/High Voltage DC Transmission.

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C410.1	Able to understand the significance of DC Transmission over AC transmission and acquire knowledge on the basics of High voltage DC current transmission technology.
C410.2	Understand and analyze the converter operation and performance and apply the concepts at HVDC stations in power system.
C410.3	Gain a thorough knowledge about the compounding and regulation of converters used in HVDC stations and their characteristics.
C410.4	To study the characteristics and effects of harmonics and to design filters to reduce harmonics thereby improving the stability of the power system.
C410.5	To model the HVDC systems using various software tools to understand its performance and to gain knowledge about cables, insulation and dielectrics used in HVDC systems.

COURSE CODE: C411 AU CODE/SUBJECT: GE6075/ Professional Ethics in Engineering

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C411.1	Define the dimensions or senses of engineering ethics and describe the various theories of moral development.
C411.2	Describe the similarities and contrast of engineering experiments Vs scientific experiments and to define the code of ethics of various professional societies.
C411.3	Understand significance of safety and risk assessment when developing engineering products.
C411.4	Understand the social responsibilities and intellectual property rights of engineers.
C411.5	Understand the process of how a Multinational company works and to describe about the role of engineers in computer ethics, environment ethics, and weapons development.

COURSE CODE:C412 AU CODE/SUBJECT: EE2452/Project Work

Enlistment of Course Outcomes:

Course Outcomes	STATEMENT
C412.1	Ability to research the solution for any practical problems arising in their field of study with the knowledge acquired through their course of study.
C412.2	Ability to plan, evaluate and design a solution to meet the dynamic change in needs of the society with insight knowledge of professional and ethical codes.
C412.3	Ability to meet the core competencies and demonstrate the knowledge of work with a cutting edge technology.
C412.4	Ability to meet the goals within a time limit in multidisciplinary fields by working individually or with a peer group and disclose the same with an effective report writing .

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAM SPECIFIC OUTCOMES

SEMESTER I

COURSE CODE: C101 AU CODE/SUBJECT: HS6151 /Technical English - I

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C101.1	0	1	0	2	0	1	0	0	1	3	1	1	1	2	1	1
C101.2	0	1	0	2	0	1	0	0	1	2	0	0	1	3	2	2
C101.3	0	1	0	1	0	1	0	1	2	2	1	1	1	3	1	1
C101.4	2	1	0	0	2	1	0	1	2	2	2	2	1	2	2	2
C101.5	1	3	0	1	2	1	0	1	2	2	1	3	1	2	1	1

COURSE CODE: C102 AU CODE/SUBJECT: MA6151 /Mathematics – I

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C102.1	3	2	1	3	2	1	1	1	1	1	1	1	3	2	2	0
C102.2	3	2	1	3	2	1	1	2	1	1	1	1	3	2	2	2
C102.3	3	2	1	3	2	1	1	1	1	1	2	2	3	2	2	0
C102.4	3	2	1	3	2	1	1	2	1	1	2	2	3	1	2	0
C102.5	3	2	1	3	2	1	1	1	1	2	2	1	3	1	2	1

COURSE CODE: C103 AU CODE/SUBJECT: PH6151/ Engineering Physics -I

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C103.1	3	3	2	3	2	1	1	1	1	1	1	2	3	2	2	1
C103.2	3	3	2	3	2	1	1	1	1	1	2	2	3	2	2	1
C103.3	3	3	2	3	2	1	1	1	1	1	1	2	3	2	2	2
C103.4	3	3	2	3	2	1	1	1	1	2	2	2	2	2	2	2
C103.5	3	3	2	3	2	1	1	1	1	2	1	2	2	2	2	1

COURSE CODE:C104 AU CODE/SUBJECT: CY6151/Engineering Chemistry – I

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C104.1	3	2	1	1	2	2	3	1	1	2	3	2	3	1	1	1
C104.2	3	1	2	2	1	1	1	1	0	2	2	2	3	1	2	1
C104.3	3	1	3	3	3	1	2	1	2	2	2	3	3	1	2	1
C104.4	3	2	2	3	2	1	1	0	2	2	1	1	3	2	2	1
C104.5	3	1	2	3	3	2	2	1	2	2	2	3	3	2	2	1

COURSE CODE:C105 AU CODE/SUBJECT: GE6151/ Computer Programming

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C105.1	3	1	1	2	1	1	0	1	1	2	2	2	3	2	2	1
C105.2	3	3	3	1	2	1	1	1	1	2	2	2	3	3	3	1
C105.3	3	3	3	1	2	1	1	1	1	2	2	2	3	3	3	1
C105.4	3	3	3	1	2	1	1	1	1	2	2	2	3	3	3	1
C105.5	3	3	3	1	2	1	1	1	1	2	2	2	3	3	3	1

COURSE CODE:C106 AU CODE/SUBJECT: GE6152/Engineering Graphics

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C106.1	3	1	1	1	3	3	1	3	2	3	1	3	3	2	2	1
C106.2	3	1	1	1	3	2	1	3	2	3	1	3	3	2	2	1
C106.3	3	1	2	1	3	3	1	3	2	3	1	3	3	3	2	1
C106.4	3	1	2	1	3	3	1	3	2	3	1	3	3	3	2	1
C106.5	3	1	2	1	3	3	1	3	2	3	1	3	3	3	3	2

COURSE CODE:C107 AU CODE/SUBJECT: GE6161/Computer Practice Lab–I

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C107.1	3	3	3	2	3	3	3	1	3	1	2	3	3	3	2	2
C107.2	3	3	3	3	2	3	3	2	3	2	3	2	3	3	1	1
C107.3	3	2	3	3	3	3	3	3	2	3	3	3	3	3	1	1
C107.4	3	3	3	2	3	3	2	1	3	1	2	3	3	2	2	2
C107.5	3	3	3	3	3	3	2	2	3	2	3	3	3	3	2	2

COURSE CODE:C108 AU CODE/SUBJECT: GE6162/Engineering Practices Laboratory

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C108.1	3	3	3	2	3	3	3	1	3	1	2	3	3	3	2	2
C108.2	3	3	3	3	2	3	3	2	3	2	3	2	3	3	1	1
C108.3	3	2	3	3	3	3	3	3	2	3	3	3	3	3	1	1
C108.4	3	3	3	2	3	3	2	1	3	1	2	3	3	2	2	2
C108.5	3	3	3	3	3	3	2	2	3	2	3	3	3	3	2	2

COURSE CODE:C109 AU CODE/SUBJECT: GE6163/ Physics and Chemistry Laboratory - I

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C109.1	2	1	2	2	2	1	1	0	2	2	2	2	3	1	1	1
C109.2	2	1	2	1	1	1	1	0	2	1	1	1	3	1	1	1
C109.3	2	1	2	1	2	2	2	0	1	1	1	1	3	2	1	1
C109.4	2	2	1	1	2	1	1	0	2	1	1	2	2	1	1	1
C109.5	2	2	1	1	1	2	2	0	1	1	2	1	2	2	1	1

SEMESTER II

COURSE CODE:C110 AU CODE/SUBJECT: HS6251/Technical English – II

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C110.1	0	2	0	2	0	2	0	0	1	3	0	0	2	2	2	2
C110.2	0	2	0	2	0	2	0	0	1	2	0	0	2	2	2	2
C110.3	0	2	0	2	0	2	0	0	2	2	0	0	2	2	2	2
C110.4	0	2	0	2	0	2	0	0	2	2	0	0	2	2	2	2
C110.5	0	3	0	2	0	2	0	0	2	2	0	0	2	2	2	2

COURSE CODE:C111 AU CODE/SUBJECT: MA6251/Mathematics – II

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C111.1	3	3	2	2	2	1	0	0	0	0	2	1	3	3	2	0
C111.2	3	3	2	2	2	1	0	0	0	0	2	1	3	3	2	0
C111.3	3	3	2	2	2	1	0	0	0	0	2	0	3	3	2	0
C111.4	3	3	2	2	2	1	0	0	0	0	2	0	3	3	2	0
C111.5	3	3	2	2	2	1	0	0	0	0	2	1	3	3	2	0

COURSE CODE:C112 AU CODE/SUBJECT: PH6251/Engineering Physics – II

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C112.1	2	2	2	3	3	1	2	0	0	0	0	2	3	3	3	2
C112.2	3	2	3	3	3	2	2	0	0	0	0	2	3	3	3	2
C112.3	3	2	3	3	2	2	3	0	0	0	0	2	3	3	3	2
C112.4	2	3	2	2	2	1	1	0	0	0	0	2	3	3	3	2
C112.5	2	2	2	2	2	2	2	0	0	0	0	2	3	3	3	2

COURSE CODE:C113 AU CODE/SUBJECT: CY6251/Engineering Chemistry – II

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C113.1	3	2	1	1	2	2	3	1	1	2	3	2	3	2	1	1
C113.2	3	2	2	2	1	1	1	1	2	2	2	2	3	2	2	1
C113.3	3	2	3	3	3	1	2	1	2	2	2	3	3	2	2	1
C113.4	3	2	2	3	2	2	2	1	2	2	1	1	3	2	2	1
C113.5	3	2	2	3	3	2	2	1	2	2	2	3	3	2	2	1

COURSE CODE: C114 AU CODE/SUBJECT: GE6251/ Basic Civil & Mechanical Engineering

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C114.1	3	2	3	2	2	3	2	0	0	3	0	3	3	2	2	1
C114.2	3	2	3	2	2	3	2	0	0	3	0	3	3	2	2	1
C114.3	3	2	2	2	2	3	3	0	0	3	0	3	3	2	2	1
C114.4	3	2	2	2	2	3	3	0	0	3	0	3	3	2	2	2
C114.5	3	2	2	2	2	3	3	0	0	3	0	3	3	2	2	2

COURSE CODE: C115 AU CODE/SUBJECT: EE6201/ Circuit Theory

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C115.1	3	3	3	3	2	1	2	1	2	1	1	2	3	3	2	1
C115.2	3	3	3	3	2	1	2	1	2	1	1	2	3	3	2	1
C115.3	3	3	3	3	2	1	2	1	2	1	1	2	3	3	2	1
C115.4	3	3	3	3	2	2	2	1	2	1	1	2	3	3	2	1
C115.5	3	3	3	3	2	2	3	1	2	1	2	3	3	3	2	1

COURSE CODE:C116 AU CODE/SUBJECT: GE6262/ Physics and Chemistry Laboratory – II

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C116.1	3	3	3	2	3	3	3	1	3	1	2	3	3	3	2	2
C116.2	3	3	3	3	2	3	3	2	3	2	3	2	3	3	1	1
C116.3	3	2	3	3	3	3	3	3	2	3	3	3	3	3	1	1
C116.4	3	3	3	2	3	3	2	1	3	1	2	3	3	2	2	2
C116.5	3	3	3	3	3	3	2	2	3	2	3	3	3	3	2	2

COURSE CODE: C117 AU CODE/SUBJECT: GE6263/ Computer Programming Laboratory

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C117.1	3	3	3	2	3	3	3	1	3	1	2	3	3	3	2	2
C117.2	3	3	3	3	2	3	3	2	3	2	3	2	3	3	1	1
C117.3	3	2	3	3	3	3	3	3	2	3	3	3	3	3	1	1
C117.4	3	3	3	2	3	3	2	1	3	1	2	3	3	2	2	2
C117.5	3	3	3	3	3	3	2	2	3	2	3	3	3	3	2	2

COURSE CODE: C118 AU CODE/SUBJECT: EE6211/Electric Circuits Laboratory

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C118.1	3	3	2	2	2	2	2	1	2	2	2	2	2	3	2	2
C118.2	2	2	2	3	2	2	2	2	1	3	2	2	3	2	2	2
C118.3	3	2	2	3	2	3	2	1	2	1	2	2	3	2	2	2
C118.4	2	2	2	2	2	2	2	1	1	1	3	1	2	3	2	2
C118.5	3	2	2	3	3	2	1	2	2	1	2	2	2	3	2	2

SEMESTER III

COURSE CODE: C201 AU CODE/SUBJECT: MA6351/Transforms and Partial Differential Equations

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C201.1	3	3	2	2	2	2	2	1	2	1	2	1	3	2	2	1
C201.2	3	3	2	2	2	2	1	1	2	1	2	1	3	2	2	2
C201.3	3	3	2	2	1	1	2	1	1	1	2	2	3	2	1	1
C201.4	3	2	1	2	1	1	1	1	1	1	3	1	2	2	2	2
C201.5	3	3	2	2	1	1	2	0	2	1	2	2	3	1	2	2

COURSE CODE: C202 AU CODE/SUBJECT: EE6301/Digital Logic Circuits

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C202.1	3	2	1	1	1	2	1	2	2	2	2	2	3	1	2	2
C202.2	3	2	3	3	2	2	2	3	2	1	2	2	2	2	2	2
C202.3	3	3	3	2	2	2	2	3	2	2	3	2	3	2	2	2
C202.4	3	3	3	3	3	2	3	3	2	2	2	2	3	2	2	2
C202.5	3	3	3	3	3	3	2	2	2	2	2	2	3	2	2	3

COURSE CODE: C203 AU CODE/SUBJECT: EE6302 /Electromagnetic Theory

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C203.1	3	3	2	2	2	2	2	1	1	2	1	2	3	3	2	1
C203.2	3	3	3	2	2	2	2	1	1	2	1	2	3	3	2	1
C203.3	3	3	3	2	2	2	1	0	1	2	1	2	3	3	2	2
C203.4	3	3	2	2	3	2	2	1	2	1	0	2	3	3	2	2
C203.5	3	2	2	2	3	2	2	1	2	2	1	2	3	3	2	1

COURSE CODE: C204 AU CODE/SUBJECT: GE6351/Environmental Science and Engineering

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C204.1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2
C204.2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
C204.3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
C204.4	3	3	3	3	2	2	2	2	2	2	3	2	3	3	2	3
C204.5	2	1	2	1	2	2	2	2	2	2	2	2	2	2	3	2

COURSE CODE: C205 AU CODE/SUBJECT: EC6202/Electronic Devices and Circuits

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C205.1	2	2	2	3	2	2	2	1	1	2	2	3	3	3	2	2
C205.2	2	2	2	3	2	2	2	1	1	2	2	3	3	3	3	2
C205.3	3	2	2	3	2	2	2	1	1	1	2	3	3	3	2	2
C205.4	3	2	2	3	2	2	2	2	1	2	2	3	3	3	2	2
C205.5	3	2	2	3	2	2	2	2	1	2	2	3	2	3	2	2

COURSE CODE: C206 AU CODE/SUBJECT: EE6303/ Linear Integrated Circuits and Applications

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C206.1	3	2	2	3	2	1	1	1	1	1	1	1	3	3	3	2
C206.2	3	2	2	3	2	1	1	1	2	1	1	1	3	3	3	2
C206.3	3	2	2	3	2	2	1	1	2	1	1	1	3	2	3	2
C206.4	3	2	3	3	2	2	2	2	1	2	2	2	3	3	2	1
C206.5	3	2	3	3	2	1	2	2	2	2	2	1	3	2	2	2

COURSE CODE: C207 AU CODE/SUBJECT: EC6361/ Electronics Laboratory

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C207.1	3	2	2	3	2	1	1	1	1	1	1	1	3	3	3	2
C207.2	3	2	2	3	2	1	1	1	2	1	1	1	3	3	3	2
C207.3	3	2	2	3	2	2	1	1	2	1	1	1	3	2	3	2
C207.4	3	2	3	3	2	2	2	2	1	2	2	2	3	3	2	1
C207.5	3	2	3	3	2	1	2	2	2	2	2	1	3	2	2	2

COURSE CODE:C208 AU CODE/SUBJECT: EE6311/ Linear and Digital Integrated Circuits Laboratory

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C208.1	3	3	2	2	1	1	1	1	1	0	0	0	3	3	2	1
C208.2	3	3	2	2	2	1	1	1	1	0	1	1	3	3	2	1
C208.3	3	3	3	3	2	2	2	0	1	1	1	1	3	3	2	1
C208.4	3	2	3	3	3	2	2	0	0	0	1	1	3	3	2	1
C208.5	3	2	3	3	3	1	3	1	1	0	2	2	3	3	2	1

SEMESTER IV

COURSE CODE: C209 AU CODE/SUBJECT: MA6459/ Numerical Methods

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C209.1	3	3	2	3	2	1	1	0	1	0	0	0	2	2	2	1
C209.2	3	3	2	3	2	1	1	0	1	0	0	0	2	2	2	1
C209.3	3	3	2	3	2	1	0	0	1	0	0	0	2	2	2	1
C209.4	3	3	2	3	2	1	1	0	1	0	0	0	2	2	2	1
C209.5	3	3	2	3	2	1	1	0	1	0	0	0	2	2	2	1

COURSE CODE: C210 AU CODE/SUBJECT: EE6401/ Electrical Machines – I

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C210.1	3	3	3	2	1	1	1	0	1	1	1	1	3	3	2	1
C210.2	3	3	3	2	1	1	1	1	2	1	1	2	3	3	2	1
C210.3	3	3	3	2	2	1	1	0	1	1	1	1	3	3	2	1
C210.4	3	3	3	2	1	1	1	0	1	1	1	1	3	3	2	1
C210.5	3	3	3	2	1	1	1	1	2	1	1	2	3	3	2	1

COURSE CODE: C211 AU CODE/SUBJECT: CS6456/ Object Oriented Programming

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C211.1	2	2	2	3	2	3	2	2	1	1	1	0	2	3	2	1
C211.2	2	2	2	3	2	2	2	1	1	1	1	1	2	3	2	1
C211.3	3	2	2	3	2	3	2	1	1	1	1	1	2	3	2	3
C211.4	3	2	2	3	2	3	2	2	1	1	1	0	2	3	2	1
C211.5	2	2	2	3	2	2	2	2	1	1	1	0	2	3	2	2

COURSE CODE: C212 AU CODE/SUBJECT: EE6402/Transmission and Distribution

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C212.1	3	2	2	1	1	1	1	1	1	1	1	1	3	3	2	1
C212.2	3	2	2	2	1	1	2	1	1	1	1	1	3	3	2	1
C212.3	3	2	3	2	1	1	1	1	1	1	1	1	3	3	2	1
C212.4	3	2	3	2	1	1	1	1	1	1	1	1	3	3	2	2
C212.5	3	2	3	2	1	1	1	1	2	2	1	1	3	3	3	2

COURSE CODE: C213 AU CODE/SUBJECT: EE6403/Discrete Time Systems And Signal Processing

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C213.1	3	2	2	0	3	2	2	1	2	0	1	2	3	3	2	1
C213.2	3	2	2	1	3	2	2	0	1	0	1	2	3	3	2	1
C213.3	3	2	2	2	3	2	2	1	0	0	1	3	3	3	2	1
C213.4	3	2	2	2	2	2	2	0	1	0	1	2	3	3	2	1
C213.5	3	1	1	0	3	2	2	1	0	0	1	3	2	3	2	1

COURSE CODE: C214 AU CODE/SUBJECT: EE6404/Measurements and Instrumentation

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C214.1	2	2	3	3	2	1	1	0	1	1	0	0	2	2	0	1
C214.2	2	2	3	3	2	1	2	0	1	1	1	0	2	2	2	1
C214.3	2	2	2	3	2	1	2	0	1	0	1	0	2	2	2	0
C214.4	2	2	2	3	2	1	1	0	1	0	0	0	2	2	2	2
C214.5	2	2	2	3	2	1	1	0	1	1	1	0	2	2	2	1

COURSE CODE: C215 AU CODE/SUBJECT: CS6461/ Object Oriented Programming Laboratory

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C215.1	3	3	2	2	1	0	1	0	0	0	0	0	3	3	0	1
C215.2	3	3	2	2	2	0	1	0	0	0	1	1	3	3	0	1
C215.3	3	3	3	3	2	0	2	0	0	1	1	1	3	3	0	1
C215.4	3	2	3	3	3	0	2	0	0	0	1	1	3	3	0	1
C215.5	3	2	3	3	3	0	3	0	0	0	2	2	3	3	0	1

COURSE CODE: C216 AU CODE/SUBJECT: EE6411/Electrical Machines - I Laboratory

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C216.1	3	3	2	2	1	0	1	0	0	0	0	0	3	3	0	1
C216.2	3	3	2	2	2	0	1	0	0	0	1	1	3	3	0	1
C216.3	3	3	3	3	2	0	2	0	0	1	1	1	3	3	0	1
C216.4	3	2	3	3	3	0	2	0	0	0	1	1	3	3	0	1
C216.5	3	2	3	3	3	0	3	0	0	0	2	2	3	3	0	1

SEMESTER V

COURSE CODE: C301 AU CODE/SUBJECT: EE6501/Power System Analysis

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C301.1	3	3	3	3	1	1	1	1	1	2	1	2	3	1	3	1
C301.2	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3	1
C301.3	3	3	3	3	3	2	1	2	2	2	1	2	3	3	3	1
C301.4	3	3	3	3	2	2	1	2	2	2	2	2	3	2	3	2
C301.5	3	3	3	3	3	2	1	1	2	2	2	2	3	3	3	2

COURSE CODE: C302 AU CODE/SUBJECT: EE6502/ Microprocessors and Microcontrollers

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C302.1	3	2	3	2	2	2	1	1	1	1	1	1	3	3	3	2
C302.2	3	2	3	2	2	2	1	2	1	1	1	1	3	3	3	2
C302.3	3	2	3	1	2	1	1	1	1	1	1	0	3	3	3	2
C302.4	3	3	3	2	3	2	1	2	3	1	1	3	3	3	3	3
C302.5	3	3	3	3	1	1	1	1	1	1	1	3	3	3	3	3

COURSE CODE: C303 AU CODE/SUBJECT: ME6701/ Power Plant Engineering

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C303.1	3	2	3	1	3	3	3	3	3	1	1	3	3	2	3	1
C303.2	3	2	1	1	1	1	1	1	2	1	1	2	3	2	2	1
C303.3	3	2	3	2	2	3	3	3	2	3	1	3	3	2	3	1
C303.4	3	3	3	3	3	3	3	3	2	3	1	3	2	3	3	1
C303.5	3	3	3	3	3	2	3	3	1	3	3	2	3	3	3	3

COURSE CODE: C304 AU CODE/SUBJECT: EE6503/ Power Electronics

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C304.1	3	3	2	2	3	1	1	1	1	3	2	2	3	2	2	1
C304.2	3	3	3	3	3	2	3	1	1	3	3	1	3	3	3	1
C304.3	2	3	3	3	3	2	3	1	1	3	3	1	3	3	3	1
C304.4	3	3	3	3	3	2	3	1	1	3	3	1	3	3	3	1
C304.5	3	3	3	3	3	2	3	1	1	3	3	1	3	3	3	1

COURSE CODE: C305 AU CODE/SUBJECT: EE2302/ Electrical Machines II

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C305.1	2	2	0	1	0	1	1	1	1	2	0	1	3	2	2	1
C305.2	3	2	1	1	0	1	1	1	1	2	0	2	3	2	2	1
C305.3	2	2	1	1	0	1	1	1	1	1	0	2	3	2	2	1
C305.4	2	1	0	0	0	1	0	0	1	1	0	2	3	2	2	1
C305.5	2	2	0	1	0	1	0	1	1	1	0	2	3	2	2	1

COURSE CODE: C306 AU CODE/SUBJECT: IC6501/ Control Systems

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C306.1	2	3	3	2	1	3	2	1	2	2	3	3	3	2	2	1
C306.2	2	2	3	2	1	2	1	1	3	2	2	3	3	3	2	1
C306.3	3	2	3	2	1	3	1	2	2	2	2	3	3	3	2	1
C306.4	2	3	2	2	1	3	1	2	2	3	3	3	3	3	2	1
C306.5	2	3	3	2	1	3	2	1	2	2	3	3	3	3	2	1

COURSE CODE: C307 AU CODE/SUBJECT: EE6511/ Control and Instrumentation Laboratory

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C307.1	3	3	2	2	1	1	1	1	1	0	0	0	3	3	2	1
C307.2	3	3	2	2	2	1	1	1	0	1	1	1	3	3	2	1
C307.3	3	3	3	3	2	1	2	1	1	1	1	1	3	3	2	1
C307.4	3	2	3	3	3	1	2	1	1	0	1	1	3	3	2	1
C307.5	3	2	3	3	3	2	3	1	1	1	2	2	3	3	2	1

COURSE CODE: C308 AU CODE/SUBJECT: GE6674/ Communication Skills Laboratory Based

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C308.1	3	3	2	2	1	0	1	0	0	0	0	0	3	3	0	1
C308.2	3	3	2	2	2	0	1	0	0	0	1	1	3	3	0	1
C308.3	3	3	3	3	2	0	2	0	0	1	1	1	3	3	0	1
C308.4	3	2	3	3	3	0	2	0	0	0	1	1	3	3	0	1
C308.5	3	2	3	3	3	0	3	0	0	0	2	2	3	3	0	1

COURSE CODE: C309 AU CODE/SUBJECT: EE6512/ Electrical Machines Laboratory – II

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C309.1	3	3	2	2	1	0	1	0	0	0	0	0	3	3	0	1
C309.2	3	3	2	2	2	0	1	0	0	0	1	1	3	3	0	1
C309.3	3	3	3	3	2	0	2	0	0	1	1	1	3	3	0	1
C309.4	3	2	3	3	3	0	2	0	0	0	1	1	3	3	0	1
C309.5	3	2	3	3	3	0	3	0	0	0	2	2	3	3	0	1

SEMESTER VI

COURSE CODE: C310 AU CODE/SUBJECT: EC6651/ Communication Engineering

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C310.1	3	2	2	3	2	1	0	0	1	1	0	2	3	3	2	1
C310.2	3	2	2	3	2	1	0	0	1	1	0	2	3	3	2	1
C310.3	3	2	2	3	2	1	0	0	1	2	1	2	3	3	2	2
C310.4	3	2	2	3	2	1	0	0	1	1	1	2	3	2	2	1
C310.5	3	2	2	3	2	1	0	0	1	1	0	2	3	2	2	1

COURSE CODE: C311 AU CODE/SUBJECT: EE6601/ Solid State Drives

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C311.1	3	2	2	2	1	2	1	2	1	1	1	2	3	2	2	1
C311.2	3	3	1	2	0	1	1	2	0	2	1	2	3	3	2	1
C311.3	3	2	1	1	0	1	1	2	0	2	1	2	3	3	2	1
C311.4	3	2	1	1	1	1	1	1	0	2	1	3	3	3	2	1
C311.5	3	3	2	2	1	1	1	1	0	1	1	2	3	2	2	1

COURSE CODE: C312 AU CODE/SUBJECT: EE6602/ Embedded Systems

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C312.1	3	2	3	3	3	0	0	0	3	2	3	3	3	3	3	1
C312.2	3	1	3	2	3	0	0	0	3	2	3	3	3	3	3	1
C312.3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3
C312.4	3	3	3	3	3	0	2	0	3	3	3	3	3	3	3	1
C312.5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

COURSE CODE: C313 AU CODE/SUBJECT: EE6603/ Power System Operation and Control

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C313.1	3	2	3	3	2	1	1	1	1	1	2	3	2	1	1	0
C313.2	3	2	2	2	2	1	1	1	1	0	2	3	2	2	1	0
C313.3	3	2	2	2	2	1	0	1	1	1	2	3	2	2	2	0
C313.4	3	2	2	3	2	2	2	1	1	1	2	3	1	2	2	0
C313.5	3	2	2	3	3	2	1	1	2	1	3	3	0	3	3	1

COURSE CODE: C314 AU CODE/SUBJECT: EE6604/ Design of Electrical Machines

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C314.1	3	3	3	3	1	1	1	2	3	2	1	2	3	1	2	3
C314.2	3	3	3	3	1	1	1	2	3	2	1	2	3	1	2	3
C314.3	3	3	3	3	1	1	1	2	3	2	1	2	3	1	2	3
C314.4	3	3	3	3	1	1	1	3	3	3	1	3	3	1	3	3
C314.5	3	3	3	3	1	1	1	2	3	2	1	2	3	1	2	3

COURSE CODE: C315 AU CODE/SUBJECT: EE6002/ Power System Transients

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C315.1	3	3	1	1	1	2	1	1	1	2	1	2	3	2	1	1
C315.2	3	3	2	2	1	2	1	1	1	1	1	2	3	2	2	1
C315.3	3	3	2	2	1	2	1	1	1	1	1	2	3	2	1	1
C315.4	3	3	2	2	3	2	1	1	1	1	1	2	3	3	3	1
C315.5	3	3	3	2	3	2	1	1	1	2	1	2	3	3	3	1

COURSE CODE: C316 AU CODE/SUBJECT: EE6611/ Power Electronics and Drives Laboratory

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C316.1	3	3	2	2	1	0	1	0	0	0	0	0	3	3	0	1
C316.2	3	3	2	2	2	0	1	0	0	0	1	1	3	3	0	1
C316.3	3	3	3	3	2	0	2	0	0	1	1	1	3	3	0	1
C316.4	3	2	3	3	3	0	2	0	0	0	1	1	3	3	0	1
C316.5	3	2	3	3	3	0	3	0	0	0	2	2	3	3	0	1

COURSE CODE: C317 AU CODE/SUBJECT: EE6612/ Microprocessors and Microcontrollers Laboratory

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C317.1	3	3	2	2	1	1	1	1	1	2	0	2	3	3	3	1
C317.2	3	3	2	2	2	1	1	1	1	0	1	2	3	3	2	1
C317.3	3	3	3	3	2	0	2	2	2	1	1	1	3	3	3	1
C317.4	3	2	3	3	3	1	2	1	1	1	1	1	3	3	2	1
C317.5	3	2	3	3	3	1	3	1	1	0	2	2	3	3	2	1

COURSE CODE: C318 AU CODE/SUBJECT: EE6613/ Presentation Skills and Technical Seminar

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C318.1	3	3	2	2	1	1	1	0	0	0	0	0	3	3	2	1
C318.2	3	3	2	2	2	1	1	0	1	0	1	1	3	3	2	1
C318.3	3	3	3	3	2	0	2	1	1	1	1	1	3	3	2	1
C318.4	3	2	3	3	3	1	2	1	0	0	1	1	3	3	2	1
C318.5	3	2	3	3	3	1	3	0	0	0	2	2	3	3	2	1

SEMESTER VII

COURSE CODE: C401 AU CODE/SUBJECT: EE6701/ High Voltage Engineering

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C401.1	3	2	2	1	2	1	2	2	1	1	1	2	3	2	2	1
C401.2	3	2	2	1	2	2	1	2	1	1	2	2	3	2	2	1
C401.3	3	2	2	1	2	2	1	1	2	1	2	2	3	2	2	1
C401.4	3	2	2	1	2	1	1	1	2	1	1	3	3	2	2	1
C401.5	3	2	2	1	2	1	2	2	1	1	1	2	3	2	2	1

COURSE CODE: C402 AU CODE/SUBJECT: EE6702/Protection and Switchgear

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C402.1	3	2	2	2	1	1	1	0	0	1	0	2	3	3	2	1
C402.2	3	3	2	2	2	1	1	1	0	1	1	2	3	2	2	1
C402.3	3	3	2	1	1	1	1	0	0	1	0	2	3	2	2	1
C402.4	3	3	3	2	1	1	1	1	1	0	0	2	3	3	3	1
C402.5	3	3	2	2	1	2	1	0	1	2	1	2	3	2	2	1

COURSE CODE: C403 AU CODE/SUBJECT: EE6703/Special Electrical Machines

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C403.1	3	3	3	3	3	2	3	1	1	3	2	1	3	3	3	1
C403.2	3	3	3	3	3	2	3	1	1	3	2	1	3	3	3	1
C403.3	2	3	3	3	3	2	3	1	1	3	2	1	3	3	3	1
C403.4	3	3	3	3	3	2	3	1	1	3	2	1	3	3	3	1
C403.5	3	3	3	3	3	2	3	1	1	3	2	1	3	3	3	1

COURSE CODE: C404 AU CODE/SUBJECT: MG6851/Principles of Management

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C404.1	1	1	1	1	1	2	3	3	3	3	3	3	1	1	1	3
C404.2	1	1	1	1	1	2	3	3	3	2	3	3	1	1	1	3
C404.3	1	2	1	1	1	2	3	3	3	3	3	3	1	1	1	3
C404.4	2	1	1	1	1	3	3	3	3	3	3	3	1	1	1	3
C404.5	1	1	1	1	1	3	3	3	3	2	3	3	1	1	2	3

COURSE CODE: C405 AU CODE/SUBJECT: EI6704/Bio Medical Instrumentation

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C405.1	3	3	2	1	3	3	3	1	1	1	2	2	3	2	2	1
C405.2	3	2	2	1	3	1	1	2	1	1	1	2	3	3	2	1
C405.3	3	2	1	1	2	1	1	2	1	2	2	3	3	3	2	1
C405.4	3	2	1	1	2	2	1	1	1	2	1	2	3	3	2	1
C405.5	3	3	2	2	2	2	1	1	1	1	1	2	3	2	2	1

COURSE CODE: C406 AU CODE/SUBJECT: EE6008/ Microcontroller Based System Design

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C406.1	3	3	3	3	3	2	1	2	1	1	1	3	3	2	2	1
C406.2	3	3	3	2	3	2	1	2	1	2	2	3	3	3	2	1
C406.3	3	3	3	3	3	3	2	2	2	2	1	3	3	3	2	1
C406.4	3	3	3	3	3	2	2	2	1	1	1	3	3	3	2	1
C406.5	3	3	3	3	3	2	2	2	1	1	1	3	3	3	2	1

COURSE CODE: C407 AU CODE/SUBJECT: EE6711/Power System Simulation Lab

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C407.1	3	3	2	2	1	0	1	0	0	0	0	0	3	3	0	1
C407.2	3	3	2	2	2	0	1	0	0	0	1	1	3	3	0	1
C407.3	3	3	3	3	2	0	2	0	0	1	1	1	3	3	0	1
C407.4	3	2	3	3	3	0	2	0	0	0	1	1	3	3	0	1
C407.5	3	2	3	3	3	0	3	0	0	0	2	2	3	3	0	1

COURSE CODE: C408 AU CODE/SUBJECT: EE6712/Comprehension

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C408.1	3	3	2	2	1	0	1	0	0	0	0	0	3	3	0	1
C408.2	3	3	2	2	2	0	1	0	0	0	1	1	3	3	0	1
C408.3	3	3	3	3	2	0	2	0	0	1	1	1	3	3	0	1
C408.4	3	2	3	3	3	0	2	0	0	0	1	1	3	3	0	1
C408.5	3	2	3	3	3	0	3	0	0	0	2	2	3	3	0	1

SEMESTER VIII

COURSE CODE: C409 AU CODE/SUBJECT: EE6801/Electric Energy Generation Utilisation and Conservation

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C409.1	1	2	1	3	2	1	1	0	1	0	0	2	3	2	2	1
C409.2	1	2	1	3	2	1	1	1	1	0	1	2	2	2	3	1
C409.3	1	2	1	3	2	1	1	0	1	0	1	1	3	2	2	1
C409.4	1	2	1	3	2	1	1	2	1	2	1	2	2	3	3	1
C409.5	1	2	1	3	2	1	1	1	1	1	0	1	3	3	2	1

COURSE CODE: C410 AU CODE/SUBJECT: EE6010/High Voltage DC Transmission.

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C410.1	1	2	1	3	2	1	1	1	1	0	1	2	3	2	2	2
C410.2	1	2	1	3	2	1	1	1	1	1	1	3	3	2	2	1
C410.3	1	2	1	3	2	1	1	1	1	1	1	2	2	3	2	1
C410.4	1	2	1	3	2	1	2	2	1	1	1	2	3	2	1	1
C410.5	1	2	1	3	2	1	2	2	1	1	1	3	2	2	2	1

COURSE CODE: C411 AU CODE/SUBJECT: GE6075/ Professional Ethics in Engineering

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C411.1	1	2	1	3	2	1	1	1	1	0	0	0	1	1	1	3
C411.2	1	2	1	3	2	1	1	1	1	0	0	0	1	1	1	3
C411.3	1	2	1	3	2	1	1	1	1	0	1	1	1	1	1	3
C411.4	1	2	1	3	2	1	1	1	1	1	1	1	1	1	1	3
C411.5	1	2	1	3	2	1	1	1	1	1	0	1	1	1	1	3

COURSE CODE:C412 AU CODE/SUBJECT: EE2452/Project Work

Mapping of Course Outcomes with Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
C412.1	3	3	3	3	3	3	3	2	2	1	2	3	3	3	3	2
C412.2	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	2
C412.3	3	3	3	3	3	3	3	2	2	1	2	3	3	3	3	3
C412.4	3	3	3	3	3	3	3	2	3	3	2	3	3	3	3	3