

ANNEXURE -I

COURSE OUTCOMES AND CO-PO MAPPING

22NPC301		Electrical Circuits and Networks	III
COURSE OUTCOMES At the end of the course, students will be able to			PO's Mapped
C01	Explain the fundamental principles of electrical circuits including passive elements, circuit laws, network theorems, transient behavior, AC circuit concepts, resonance, coupled circuits, polyphase systems, and two-port networks used in electrical engineering applications.		-
C02	Apply circuit analysis techniques including Kirchhoff's laws, nodal analysis, mesh analysis, source transformation, network theorems, phasor analysis, and transient response methods to determine electrical quantities in DC and AC circuits.		P01
C03	Analyze the steady-state and transient performance of linear electrical circuits by evaluating voltage, current, power, resonance characteristics, power factor, coupled circuits, and balanced and unbalanced three-phase systems.		P02
C04	Design and evaluate electrical circuit solutions by selecting appropriate circuit analysis methods, resonance conditions, transformer models, and equivalent network representations for practical engineering applications.		P03
C05	Design electrical networks by selecting appropriate circuit analysis techniques, two-port network representations, and three-phase circuit models for practical electrical engineering applications. (Case Studies/Tutorials)		P04, P08, P09, P011
C06	Engage in self-learning by utilizing simulation tools and modern computational techniques to model, analyze, validate, and interpret the behavior of electrical circuits and networks for real-world engineering applications. (Case Studies/Seminars/Simulation Exercises)		P05, P08, P09, P011

COURSE ARTICULATION MATRIX:														
CO and PO Mapping:														
	PO 1	P O 2	P O 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PSO 1	PSO 2	PSO 3
C01	-	-	-	-	-	-	-	-	-	-	-	3	-	-
C02	3	-	-	-	-	-	-	-	-	-	-	3	-	-
C03	-	3		-	-	-	-	-	-	-	-	3	-	-
C04	-	-	3	-	-	-	-	-	-	-	-	3	-	-
C05	-	-	-	3	-	-	-	2	3	-	2	3	-	-
C06	-	-	-	-	3	-	-	2	3	-	2	3	-	-
22NPC301	3	3	3	3	3	-	-	2	3	-	2	3	-	-
	1 – Slight, 2 – Moderate, 3 – Substantial													

22NPC302		Analog Electronics	III
COURSE OUTCOMES At the end of the course, students will be able to			PO's Mapped
C01	Explain the structure, operation, characteristics, and applications of semiconductor devices, transistors, amplifiers, feedback circuits, and oscillators.		-
C02	Apply the principles of semiconductor devices, rectifiers, regulators, BJTs, FETs, and thyristors to determine the electrical parameters.		PO1
C03	Analyze the characteristics, biasing methods, amplifier configurations, feedback networks, and oscillator circuits for specific applications.		PO2
C04	Design electronic circuits such as power supplies, transistor biasing networks, amplifiers, feedback amplifiers, oscillators, and multivibrators to meet given specifications.		PO3
C05	Develop and simulate electronic circuits using appropriate electronic design and simulation tools to evaluate circuit performance and validate theoretical concepts.		PO5
C06	Design, implement, and demonstrate a mini-project or Technical Seminar incorporating semiconductor devices, amplifiers, feedback circuits, or oscillators to address a practical engineering application.		PO4, PO8, PO9, PO10

COURSE ARTICULATION MATRIX:														
CO and PO Mapping:														
	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PSO 1	PSO 2	PSO 3
C01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C02	3	-	-	-	-	-	-	-	-	-	-	3	-	-
C03	-	3	-	-	-	-	-	-	-	-	-	3	-	-
C04	-	-	3	-	-	-	-	-	-	-	-	3	-	-
C05	-	-	-	-	3	-	-	-	-	-	-	3	-	-
C06	-	-	-	3	-	-	-	3	3	3	-	3	-	-
22NPC302	3	3	3	3	3	-	-	3	3	3	-	3	-	-
1 – Slight, 2 – Moderate, 3 – Substantial														

22NPC303		Sensors and Transducers	III
COURSE OUTCOMES			PO's Mapped
At the end of the course, students will be able to			
C01	Explain the principles, characteristics, classification, applications of various sensors and transducers used for measuring physical parameters.		-
C02	Apply the principles of resistive, inductive, capacitive, photoelectric, piezoelectric, Hall-effect, ultrasonic, and smart sensors to measure engineering parameters such as force, displacement, pressure, vibration, temperature, and liquid level.		PO1
C03	Analyze the static and dynamic characteristics, sources of measurement errors, and suitability of different transducers for specific engineering measurement applications.		PO2
C04	Select and design suitable sensor-based measurement systems with appropriate signal conditioning circuits for engineering applications.		PO3
C05	Simulate and evaluate the performance of sensors using any simulation software.		PO4, PO5
C06	Work in team and communicate technical information related to emerging sensing technologies.		PO8, PO9, PO11

CO-PO Mapping

	P O 1	P O 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PSO 1	PSO 2	PSO 3
C01	-	-	-	-	-	-	-	-	-	-	-	1	3	2
C02	3		-	-	-	-	-	-	-	-	-	1	3	2
C03	-	3	-	-	-	-	-	-	-	-	-	1	3	2
C04	-	-	3	-	-	-	-	-	-	-	-	1	3	2
C05	-	-	-	3	3	-	-	-	-	-	-	1	3	2
C06	-	-	-	-	-	-	-	3	3	-	3	1	3	2
22NPC 303	3	3	3	3	3	-	-	3	3	-	3	1	3	2

22NPC304		Electrical and Electronic measurement Techniques	III
COURSE OUTCOMES			PO's Mapped
At the end of the course, students will be able to			
C01	Explain the operating principles, construction, characteristics, and applications of moving coil, moving iron, electro-dynamometer, single and 3 phase energy meter, Wattmeter, AC and DC bridges, electronic and waveform analyzing instruments.	-	
C02	Apply electrical and electronic instruments for the measurement of voltage, current, power, and energy, and utilize DC and AC bridges for the measurement of resistance, inductance, and capacitance.	P01	
C03	Analyze the characteristics of analog and digital instruments, waveform generating instruments like CRO, DSO and Spectrum analyzer for engineering measurements.	P02	
C04	Design electrical instruments, bridges and waveform generation circuits for the measurement of voltage, current, timeperiod, frequency and phase difference.	P03, P04	
C05	Use modern equipment like CRO, DSO, Spectrum analyzer/virtual instrumentation techniques for analysis of electrical waveforms in engineering measurements.	P03,P04, P05, P06	
C06	Work in teams to study, analyze, and present seminar / project work for real time measurement of electrical parameters.	P08, P09, P011	

CO-PO Mapping

	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PSO 1	PSO 2	PSO 3
C01	-	-	-	-	-	-	-	-	-	-	-	3	2	-
C02	3		-	-	-	-	-	-	-	-	-	3	2	-
C03	-	3	-	-	-	-	-	-	-	-	-	3	2	-
C04	-	-	3	2	-	-	-	-	-	-	-	3	2	-
C05	-	-	3	2	3	2	-	-	-	-	-	3	2	-
C06	-	-	-	-	-	-	-	3	3	-	3	3	2	-
22NPC 304	3	3	3	2	3	2	-	3	3	-	3	3	2	-

22NPC305		Sensors and Measurements Laboratory	III
COURSE OUTCOMES At the end of the course, students will be able to			PO's Mapped
C01	Select and apply appropriate sensors, transducers, laboratory instruments, and measurement techniques to perform experiments for measuring physical and electrical quantities.		PO1
C02	Conduct experiments to characterize the performance of resistive, inductive, capacitive, optical, thermal, pressure, force, and displacement sensors by determining their static and dynamic characteristics.		PO2
C03	Apply bridge circuits, loading effect analysis, and electronic measuring instruments to measure resistance, inductance, capacitance, frequency, voltage, current, and other electrical quantities with appropriate accuracy.		PO3
C04	Analyze and validate experimental results by comparing theoretical and measured values, estimating measurement errors, and interpreting the performance of sensors and measurement systems.		PO4
C05	Work effectively as an individual and in teams to plan, conduct, and troubleshoot laboratory experiments by adhering to standard operating procedures and safety practices.		PO8, PO11
C06	Communicate experimental findings through well-organized laboratory records, technical reports, graphical analysis, and presentations using appropriate engineering standards and terminology.		PO9, PO11

	COURSE ARTICULATION MATRIX:													
	CO and PO Mapping:													
	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PSO 1	PSO 2	PSO 3
CO1	3	-	-	-	-	-	-	-	-	-	-	3	2	-
CO2	-	3	-	-	-	-	-	-	-	-	-	3	2	-
CO3	-	-	3	-	-	-	-	-	-	-	-	3	2	-
CO4	-	-	-	3	-	-	-	-	-	-	-	3	2	-
CO5	-	-	-	-	-	-	-	3	-	-	3	3	2	-
CO6	-	-	-	-	-	-	-	-	3	-	3	3	2	-
22NPC305	3	3	3	3	-	-	-	3	3	-	3	3	2	-
	1 – Slight, 2 – Moderate, 3 – Substantial													

22NPC306		Electrical and Electronic circuits Laboratory	III
COURSE OUTCOMES At the end of the course, students will be able to			PO's Mapped
C01	Explain the principles and operation of basic electrical networks, semiconductor devices, and electronic circuits implemented in the laboratory.		-
C02	Apply circuit laws, and theorems, and electronic device characteristics to perform laboratory experiments and validate theoretical concepts.		P01
C03	Analyze the performance of electrical and electronic circuits through experimental observations and measurements.		P02
C04	Design and implement basic electronic circuits including amplifiers, switching circuits, multivibrators, and voltage regulators to meet given functional specifications.		P03
C05	Simulate electrical and electronic circuits using appropriate software tools and compare simulated results with experimental outcomes.		P05
C06	Work effectively in a team to conduct laboratory experiments, analyze and interpret results, and communicate findings through laboratory records, demonstrations, and mini-projects.		P09, P010, P011

COURSE ARTICULATION MATRIX:														
CO and PO Mapping:														
	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PSO 1	PSO 2	PSO 3
C01	-	-	-	-	-	-	-	-	-	-	-	3	-	-
C02	3	-	-	-	-	-	-	-	-	-	-	3	-	-
C03	-	3	-	-	-	-	-	-	-	-	-	3	-	-
C04	-	-	3	-	-	-	-	-	-	-	-	3	-	-
C05	-	-	-	-	3	-	-	-	-	-	-	3	-	-
C06	-	-	-	-	-	-	-	-	3	3	3	-	-	-
22NPC306	3	3	3	-	3	-	-	-	3	3	3	3	-	-

22NPC513	Control System Design	V
COURSE OUTCOMES: On completion of this course, the students will be able to		POs Mapped
C01	Explain the principles of control systems, mathematical modelling of physical systems, transfer function representation, transient and steady-state response, stability concepts, compensator fundamentals, and state-space representation of linear systems.	-
C02	Apply classical control techniques such as block diagram reduction, signal flow graphs, time-domain analysis, time and frequency domain plots, and state-space methods to evaluate the performance of linear control systems.	PO1
C03	Analyze the stability, transient response, steady-state performance, controllability, observability, and frequency response characteristics of continuous-time control systems using analytical and graphical methods.	PO2
C04	Design appropriate controllers and compensators (PI, PD, PID, Lead, Lag, Lead-Lag, Cascade compensators) to satisfy specified performance requirements using classical and state-space design approaches.	PO3,PO4
C05	Develop and simulate mathematical models and control system designs using simulation tools, and interpret system responses through time-domain, frequency-domain, stability, compensator, and state-space simulations.	PO5
C06	Collaborate effectively in teams to plan, model, simulate, evaluate, and present a tech talk or mini-project on a real-world control system application by integrating modelling, stability analysis, controller design, and state-space concepts with professional documentation and communication.	PO8, PO9, PO11

CO-PO Mapping

	P O 1	P O 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PSO 1	PSO 2	PSO 3
C01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C02	3		-	-	-	-	-	-	-	-	-	1	3	2
C03	-	3	-	-	-	-	-	-	-	-	-	1	3	2
C04	-	-	3	3	-	-	-	-	-	-	-	1	3	2
C05	-	-	-	-	3	-	-	-	-	-	-	1	3	2
C06	-	-	-	-	-	-	-	2	3	-	3	1	3	2
22NPC 513	3	3	3	3	3			2	3		3	1	3	2

22NPC514	Fundamentals of Digital Signal Processing	V
COURSE OUTCOMES: On completion of this course, the students will be able to		POs Mapped
C01	Explain the fundamental concepts of signal processing, convolution, correlation, Fourier transform, IIR/FIR filter structures, and architecture of DSP processor.	-
C02	Apply convolution, correlation, and DFT/FFT algorithms for processing of discrete-time signals.	PO1, PO2
C03	Analyze the frequency response, stability, and magnitude characteristics of IIR and FIR digital filters.	PO2, PO4
C04	Design IIR and FIR digital filters using analog transformations, windowing, and frequency sampling techniques for target specifications.	PO3
C05	Simulate and evaluate signal processing algorithms, filter designs, and real-time DSP operations using modern computational tools.	PO5
C06	Work in teams to study, analyze, and present technical seminar / mini-project on real-time signal processing applications.	PO8, PO9, PO10, PO11

CO-PO Mapping

	P O 1	P O 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PSO 1	PSO 2	PSO 3
C01	-	-	-	-	-	-	-	-	-	-	-	3	-	-
C02	3	3	-	-	-	-	-	-	-	-	-	3	-	-
C03	-	3	-	2	-	-	-	-	-	-	-	3	2	-
C04	-	-	3	-	-	-	-	-	-	-	-	3	3	-
C05	-	-	-	-	3	-	-	-	-	-	-	2	-	3
C06	-	-	-	-	-	-	-	3	3	3	2	2	-	3
22NPC 514	3	3	3	2	3			3	3	3	2	2.7	2.5	3

22NPC515		Microprocessors, Microcontrollers and Interfacing	V
COURSE OUTCOMES At the end of the course, students will be able to			PO's Mapped
C01	Explain the architecture, instruction sets, programming concepts, interfacing techniques of 8085, 8086, 8051, PIC, AVR microcontrollers, and ARM processors.		-
C02	Apply the instruction sets, interrupts, timers, serial communication, assembly/C programming techniques of microprocessors and microcontrollers to solve engineering problems.		PO1
C03	Analyze the architecture, memory organization, peripheral interfaces, communication protocols, and performance of microprocessors and microcontrollers for suitable embedded applications.		PO2
C04	Design and develop microprocessor and microcontroller-based embedded systems by interfacing peripheral devices such as ADC, DAC, LCD, keyboard, memory, communication interfaces, and motor control circuits to meet application requirements.		PO3
C05	Simulate using software tools to analyse the performance of the different microcontrollers.		PO5
C06	Work in team and communicate technical information related to microprocessor and microcontroller-based solutions through seminars/mini-project.		PO8, PO9, PO11

CO-PO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PSO 1	PSO 2	PSO 3
C01	-	-	-	-	-	-	-	-	-	-	-	3	1	1
C02	3		-	-	-	-	-	-	-	-	-	3	1	1
C03	-	3	-	-	-	-	-	-	-	-	-	3	1	1
C04	-	-	3	-	-	-	-	-	-	-	-	3	1	1
C05	-	-	-	-	3	-	-	-	-	-	-	3	1	1
C06	-	-	-	-	-	-	-	3	3	-	3	3	1	1
22NPC 515	3	3	3		3			3	3		3	3	1	1

22NPC517		INDUSTRIAL HYDRAULICS AND PNEUMATICS	V
COURSEOUTCOMES: At the end of the course, the students will have the ability to:			PO'sMapped
C01	Explain the fundamentals of fluid power, including fluid properties, governing laws, and standard ISO/ANSI symbols for hydraulic and pneumatic systems		-
C02	Apply procedures for the installation, maintenance, and troubleshooting of industrial hydraulic and pneumatic power packs and systems through operating principles of hydraulic and pneumatic components such as pumps, actuators, control valves and auxiliary components.		P01
C03	Analyze various control circuits, including sequencing, synchronizing, and fail-safe hydraulic circuits, as well as pneumatic logic circuits and its performance characteristics		P02
C04	Design the sequential and electro-pneumatic circuits for industrial applications using design methods like Classic, Cascade, and Step counter		P03
C05	Investigate the performance of hydraulic and pneumatic systems using appropriate analytical/experimental/simulation techniques.		P04, P05
C06	Assess the efficiency and safety of hydraulic and Pneumatic systems in real world applications and effectively communicate technical findings through seminars / assignments / case studies / projects .		P06, P08, P09, P011

COs/POs	PO 1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PS01	PS02	PSO 3
C01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C02	3		-	-	-	-	-	-	-	-	-	-	2	2
C03	-	3	-	-	-	-	-	-	-	-	-	-	2	2
C04	-	-	3	-	-	-	-	-	-	-	-	-	2	2
C05	-	-	-	3	3	-	-	-	-	-	-	-	2	2
C06	-	-	-	-	-	3	-	3	3	-	3	-	2	2
22NPC 517	3	3	3	3	3	3	-	3	3	-	3	-	2	2

22NPC518		Control System Design Laboratory	V
	COURSE OUTCOMES At the end of the course, students will be able to	POs Mapped	
C01	Explain the principles of mathematical modelling, time-domain and frequency-domain analysis, stability concepts, controller design, and state-space representation through experimental investigation of control systems.	-	
C02	Apply experimental procedures and computational tools to model control systems, evaluate system responses, determine stability, design controllers, and obtain state-space representations for engineering applications.	P01	
C03	Analyze the performance, stability, controllability, observability, and dynamic characteristics of control systems by interpreting the results obtained from experimental and computational investigations.	P02	
C04	Design suitable compensators, controllers, and state-space models to achieve specified performance requirements and validate their effectiveness through experimental implementation and performance evaluation.	P03, P04	
C05	Simulate the modelling, analysis, stability assessment, controller tuning, compensator design, and state-space techniques through simulation-based investigations and interpret the results to validate system performance.	P05	
C06	Collaborate effectively in a team to plan, execute experiments, document, and present a laboratory-based record involving modelling, analysis, controller design, stability evaluation, and state-space representation of a practical control system while communication skills.	P06, P07, P09, P011	

CO-PO Mapping

	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PSO 1	PSO 2	PSO 3
C01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C02	3	-	-	-	-	-	-	-	-	-	-	1	3	2
C03	-	3	-	-	-	-	-	-	-	-	-	1	3	2
C04	-	-	3	3	-	-	-	-	-	-	-	1	3	2
C05	-	-	-	-	3	-	-	-	-	-	-	1	3	2
C06	-	-	-	-	-	-	-	2	3	-	3	1	3	2
22NPC 518	3	3	3	3	3	-	-	2	3		3	1	3	2

22NPC519		Microprocessors, Microcontrollers and Interfacing Laboratory	V
	COURSE OUTCOMES At the end of the course, students will be able to		POs Mapped
C01	Apply the programming concepts, interfacing of microprocessor and microcontroller-based systems using 8085, 8086, 8051/PIC trainer kits and peripheral devices.		P01
C02	Analyze the performance of microprocessor and microcontroller programs by identifying programming errors and debugging hardware interfaces.		P02
C03	Develop assembly language programming to implement arithmetic, logical, and peripheral control programs using microprocessors and microcontrollers.		P03
C04	Design the circuits to interface ADC/DAC, sensors, displays, keyboards, stepper motors, and programmable peripheral devices.		P04
C05	Work effectively in teams to conduct the experiment and demonstrate the microcontroller-based solutions.		P08, P011
C06	Demonstrate effective communication skills by documenting experiments through technical reports and presenting the results.		P09, P011

CO-PO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PSO 1	PSO 2	PSO 3
C01	3	-	-	-	-	-	-	-	-	-	-	2	1	1
C02	-	3	-	-	-	-	-	-	-	-	-	2	1	1
C03	-	-	3	-	-	-	-	-	-	-	-	2	1	1
C04	-	-	-	3	-	-	-	-	-	-	-	2	1	1
C05	-	-	-	-	-	-	-	3	-	-	3	2	1	1
C06	-	-	-	-	-	-	-	-	3	-	3	2	1	1
22NP C 519	3	3	3	3				3	3		3	2	1	1

22NPC520	INDUSTRIAL INSTRUMENTATION LABORATORY	V
COURSE OUTCOMES:		PO's Mapped
C01	Calibrate and determine the characteristics of process instruments such as pH meter, hygrometer, I/P converter and P/I converter.	P01, P02
C02	Perform flow measurement experiments using turbine flowmeter, rotameter, venturimeter and orifice meter, and determine their performance parameters.	P01, P04
C03	Calibrate pressure gauges using a dead weight tester and evaluate the accuracy of pressure measurement systems.	P01,P02
C04	Configure differential pressure (DP) transmitters for level and flow measurements using orifice and venturi as primary elements.	P03, P04
C05	Design, develop, simulate and experiment signal conditioning circuits for temperature measuring devices like RTD, Thermocouple and temperature transmitter.	P02, P05, P011
C06	Analyze experimental results, interpret measurement data, prepare technical reports, and use modern process instrumentation safely and effectively.	P04, P010, P011

COs \ POs	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	PS01	PS02	PS03
C01	3	3	–	–	–	–	–	–	–	–	–	1	3	2
C02	3	-	–	3	-	–	–	–	–	–	–	1	3	2
C03	3	3	–	–	–	–	–	–	–	–	–	1	3	2
C04	–	–	3	2	-	–	-	–	–	–	–	1	3	2
C05	–	2	-	–	3	-	-	–	–	–	2	1	3	1
C06	–	–	–	2	-	–	–	–	–	2	2	1	2	1
22NPC520	3	2.6	3	2.3	3	-	-	-	-	2	2	1	2.83	2

22NPC727		Instrumentation System Design	VII
COURSE OUTCOMES			PO's Mapped
At the end of the course, students will be able to			
C01	Explain the principles, operating characteristics, design methodologies, and applications of instrumentation systems, including signal conditioning circuits, process measuring instruments, final control elements, and PID controller-based automation systems.		-
C02	Apply engineering principles, design equations, and instrumentation techniques to perform the sizing, selection, configuration, and calibration of process measuring instruments, signal conditioning circuits, control valves, pumps, and controller systems for industrial process applications.		P01
C03	Analyze the performance and design requirements of instrumentation systems by evaluating process conditions, measurement characteristics, control strategies, Piping and Instrumentation (P&I) diagrams, and logic circuits to select appropriate engineering solutions.		P02, P03, P04, P06
C04	Design analog and digital signal conditioning circuits, process measuring instruments, final control elements, pneumatic systems, PID controllers, and industrial logic circuits to meet specified process measurement and control requirements.		P03, P04, P06, P09
C05	Simulate the operation and performance of instrumentation and control systems, including measurement circuits, control loops, data acquisition systems, PID controllers, and industrial logic circuits, using appropriate engineering software and modern design tools.		P05, P09, P011
C06	Present a technical seminar on the design, implementation, performance evaluation, or industrial application of instrumentation systems, process control components, and automation technologies by effectively communicating engineering concepts, design methodologies, simulation results, and technical findings.		P05, P09, P010, P011,

a) CO/PO Mapping															
COs/POs	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	PS01	PS02	PS03
C01	-	-	-	-	-	-	-	-	-	-	-	-	2	2	1
C02	3	-	-	-	-	-	-	-	-	-	-	-	3	3	2
C03	-	3	2	3	2	-	-	-	-	-	-	-	2	3	2
C04	-	-	3	3	2	1	-	-	3	-	-	-	3	3	3
C05	-	-	-	-	2	-	-	-	3	1	2	1	3	2	3
C06	-	-	-	-	1	-	-	-	2	3	1	1	1	2	2
22NPC727	3	3	2.5	3	1.7	1	-	-	2.6	2	1.5	1	2.3	2.5	2.1