

# AMRUTVAHINI COLLEGE OF ENGINEERING, SANGAMNER

## Department of Electronics and Telecommunication Engineering

### Course Outcomes

Final Year: 2015 Course			
Course Code	Course Name	Course Outcomes	
<b>Semester- I</b>			
404181	VLSI Design & Technology	CO1	Write effective HDL coding for digital design.
		CO2	Apply knowledge of real time issues in digital design.
		CO3	Model digital circuit with HDL, simulate, synthesis and prototype in PLDs (CPLD and FPGA).
		CO4	Apply concepts of CMOS circuits for specified applications and Analyze various issues and constraints in design of an ASIC.
		CO5	Apply knowledge of testability in design and build self-test circuit.
		CO6	Perform the experiments on VLSI Design and Technology in a team and as an individual using appropriate engineering tools. Comprehend and write laboratory record following academic ethics and draw conclusions at technical level.
404182	Computer Networks & Security	CO1	Explore the Fundamental principles of Local Area Networks including wired & wireless standard network
		CO2	Compile the hardware, software requirements for network layer and define IPv4 & IPv6. Compare IPv4 and IPv6 and discuss transition of IPv6 from IPv4.
		CO3	Select the appropriate protocol for transport layer of computer network.
		CO4	Summarize application layer protocols and select appropriate protocol for given application.
		CO5	Develop encryption and decryption algorithms for coding plain text.
		CO6	Carry out experiment on networking in a group and as an individual. Comprehend and write laboratory record by adopting professional and academic ethics and draw conclusions at technical level.
404183	Radiation & Microwave Engineering	CO1	Apply the fundamentals of electromagnetic to derive free space propagation equation and distinguish various performance parameters of radiating elements.
		CO2	Analyze and compare various radiating elements & arrays. Construct radiation pattern using pattern multiplication rule.
		CO3	Identify various modes in the waveguide. Compare, investigate: coaxial line, rectangular waveguides & stripline and identify applications of the same.
		CO4	Explore construction and working of principles passive and active microwave devices/components.
		CO5	Devise set ups of microwave measurement devices to measure performance parameters of microwave components in various applications. Demonstrate the effect of radiations on environmental sustainability.
		CO6	Carry out experiments as an individual and in a team using suitable hardware/software tools. Comprehend and write a laboratory record following academic ethics and draw conclusions at a technical level.
404184	Digital Image and Video Processing (Elective – I)	CO1	Implement basic operations, enhancement operations in spatial domain/frequency domain and image restoration operations on digital images through investigation of the problem domain
		CO2	Calculate compression ratio by applying 2D compression techniques for digital images
		CO3	Identify appropriate thresholding, edge detection or morphological technique for object segmentation and recognition
		CO4	Represent objects and regions of the image by choosing appropriate method
		CO5	Explore video signal representation and different algorithm for video processing
		CO6	Perform operations on digital images as an individual and in team using appropriate software tools. Comprehend and write a laboratory record

			following academic ethics, and draw conclusions at technical level by analysing output.
404184	Internet of Things (Elective – I)	CO1	Understand the various concepts, terminologies and architecture of IoT systems.
		CO2	Learn basics of Sensor Networks for IoT
		CO3	Understand the use of sensors and actuators for design of IoT.
		CO4	Understand the use of various protocols for design of IoT systems
		CO5	Survey various techniques used for data storage and analytics in IoT.
		CO6	Discuss the various application areas of an IoT system.
404185	Electronic Product Design (Elective – II)	CO1	Explain the stages of product (hardware/ software) design and development. Also know the basic parameters of product design like elements of successful design, grounding, shielding, energy coupling etc.
		CO2	Identify different considerations of hardware design such as functional design, architectural design, module debug and testing.
		CO3	Use of different considerations of software design like waterfall model, good programming practice, software design limitations and software testing of electronics product.
		CO4	Apply methods of PCB design- routing topology, partitioning, and grounding and to know different tools used for PCB Design.
		CO5	Use the product debugging and testing process, component selection and testing for product development.
		CO6	Use the processes and importance of documentation, types of documents, document preparation, presentation and preservation.
404185	Artificial Intelligence	CO1	Understand the fundamentals of Artificial Intelligence (AI), and AI agents.
		CO2	Learn various searching algorithms useful in AI.
		CO3	Apply the concepts of knowledge representation to solve simple AI problems.
		CO4	Learn various modes of learning in AI.
		CO5	Understand the fundamentals of pattern recognition and expert system.
		CO6	Learn the concepts of natural language programming (NLP) and associated models.
404188	Project Stage I	CO1	Identify the problem statement based on interested domain, literature survey, recent trends and real life problems and formulate aim and objectives.
		CO2	Apply engineering knowledge for preparation of exhaustive list of possible software and hardware resources to solve the identified engineering problem and select appropriate from it.
		CO3	Schedule, distribute and demonstrate the proposed algorithm/flowchart of project work as an individual and in a team.
		CO4	Demonstrate effectively the ability to present the project work in oral and written form.
<b>Semester- II</b>			
404189	Mobile Communication	CO1	Apply the concepts of switching technique to design multistage networks.
		CO2	Apply the concepts of Traffic Engineering to design Mobile networks.
		CO3	Explore the cellular concept & propagation mechanism to develop optimal cellular networks
		CO4	Identify elements of GSM, explore its services, applications, radio transmission parameters, and call setup procedure and handover mechanism for cellular communication.
		CO5	Differentiate thoroughly the generations of mobile technologies (1G to 5G).
		CO6	Carry out experiment on mobile communication in a group and as an individual, comprehend, write laboratory record by adopting professional and academic ethics and draw conclusions at technical level.
404190	Broadband Communication Systems	CO1	Explore the basic working mechanism and components of optical fiber communication system.
		CO2	Set up Link power budget and Rise Time Budget analysis of optical fiber communication system; and judge its viability.
		CO3	Illustrate the construction and working mechanism of advanced WDM optical components including isolator, circulator, coupler and fiber bragg grating.
		CO4	Explore the basic working mechanism and components of satellite communication.

		CO5	Set up Link power budget analysis of a satellite communication system; and judge its viability.
	Lab Practice-III (MOC+BCS)	CO1	
		CO2	
		CO3	To understand the working principles of optical fiber system components with experimentation using suitable hardware; set up the optical fiber communication link; and analyze the system in terms of power and rise time.
		CO4	To understand the working of satellite communication system with experimentation using suitable hardware; and analyze the system in terms of carrier to noise ratio.

		CO6	Carry out experiments as an individual and in a team, comprehend and write a laboratory record and draw conclusions at a technical level.
404191	PLC & Automation (Elective-III)	CO1	Understand concepts and principles of process control engineering and automation, advantages and effects of automation.
		CO2	Design transmitters and signal conditioners for given set of specifications
		CO3	Understand working principle of controllers and actuators used in process control engineering and automation
		CO4	Develop PLC ladder programs for simple industrial applications
		CO5	Understand industrial communication standards and industrial automation systems used in industrial automation.
		CO6	Develop automation applications by carrying out experiments as an individual and in a team using appropriate engineering tools. Comprehend and write a laboratory record following academic ethics, and draw conclusions at technical level by analysing the output.
404191	Audio Video Engineering (Elective-III)	CO1	Explore the basic fundamentals of television systems, discriminate their construction and working principle. Discuss different Colour Television standards.
		CO2	Recall the fundamentals of digital television systems (DTV) its standards, parameters and Distinguish them with High definition television systems (HDTV)
		CO3	Classify various HD Television standards and Digital Television broadcasting systems and acquainted with different types of analog TV, digital TV and HDTV systems
		CO4	Recommend the proper advanced television systems and their alternatives. Enlist the fundamentals of Audio Video Recording & reproduction techniques.
		CO5	Understand acoustic fundamentals and various acoustic systems.
		CO6	Test and verify various compression tools used for audio/ video/ image files. Carry out experiments as an individual and in a team, comprehend and write a laboratory record. Test and find out the possible faults in the television set.
404192	Wireless Sensor Networks (Elective-IV)	CO1	Summarize fundamental concepts and terminologies used in Wireless Sensor Network.
		CO2	Describe importance and applications (use) of radio communication and link management in Wireless Sensor Network.
		CO3	Distinguish between various wireless standards and classify the protocols associated with Wireless Sensor Network.
		CO4	Identify importance of localization, select appropriate routing techniques and deployment schemes in Wireless Sensor Network.
		CO5	Explore various data aggregation techniques and identify different security issues and threats in Wireless Sensor Network.
		CO6	Analyse challenges in the Design and deployment of WSN based applications.
404195	Project Stage-II	CO1	Demonstrate compliance to the prescribed standards/safety norms and environmental factors through implementation of the identified engineering problem.
		CO2	Design, implement and demonstrate working of project and to arrive at valid conclusion.
		CO3	Engage in effective oral and written communication through the project report, Research Paper and the poster presentation of the project work.