



**BANSAL INSTITUTE OF RESEARCH AND TECHNOLOGY,
BHOPAL**
Kokta Anand Nagar, Bhopal



**DEPARTMENT OF ELECTRONICS & COMMUNICATION
ENGINEERING**

COURSE OUTCOMES (COs)

Semester: VII

Course Name: VLSI Design		Course Code: EC-701
Students will be able to:		
CO1:	Define IC Fabrication process using NMOS, CMOS, Bipolar technology & hybrid technology & its design rules for different process parameters.	
CO2:	Explain the various active & passive components, DIODE, MOSFET, BJT Model & noise effect at High Frequency.	
CO3:	Analyze the Diode, MOSFET, & BJT models at high frequency using Spice.	
CO4:	Explain different types of static & dynamic memory using Systolic Arrays & bit -Serial Processing elements.	
CO5:	Evaluate the IC fabrication technology using Twin Tub method, design rules, latch up & its prevention in CMOS fabrication Process.	

Course Name: Departmental Elective (Information Theory & Coding)		Course Code: EC-702(B)
Students will be able to:		
CO1:	Acquire the knowledge in measurement of information and errors.	
CO2:	Know the application of coding theorem for efficient utilization of communication resources.	
CO3:	Understand the utilization of various communication channels for communication system.	



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CO4:	Design the block and cyclic codes for error correction and detection in communication systems
CO5:	Know the significance of source and channel codes in various applications.

Course Name: Open Elective (Cellular Mobile Communication)	-Course Code: EC-703(A)
Students will be able to:	
CO1:	Understand the concept & elements of cellular radio system design.
CO2:	Explain the concept of cell site antenna & coverage for signal & traffic
CO3:	Examine the concept of co-channel interference reduction & non co-channel interference.
CO4:	Analyze the concept of frequency management & channel assignment.
CO5:	Illustrate the concept of digital cellular systems.

Course Name: IOT Lab	Course Code: EC-705
Students will be able to:	
CO1:	To demonstrate the understanding of programming tools and different types of prototyping boards such as Arduino and Raspberry Pi
CO2:	Apply knowledge of GPIO pins and develop interface between Arduino/Raspberry-Pi and LEDs, RGB LEDs, buttons etc.
CO3:	Apply knowledge of analog to digital converter and serial communication to develop interface between Arduino and analog sensors.



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CO4:	Develop hardware / software interface between Arduino/Raspberry-Pi and wireless protocols such as NFC, RFID, Bluetooth, Zigbee etc.
CO5:	To establish communication between Arduino/Raspberry-Pi and IoT cloud using IoT protocols such as MQTT and CoAP.

Course Name: Major Project-I		Course Code: EC-706
Students will be able to:		
CO1:	Identify the electronic components required to implement the project.	
CO2:	Collect, Analyze & integrate the relevant information to specific components required in project.	
CO3:	Identify, select & use the modern tools including hardware & software required in implementation of project	
CO4:	Communicate proficiently with team members & community at large in written & oral forms	
CO5:	Demonstrate an awareness and application of appropriate personal, societal responsibilities, and professional & ethical standards	

HOD EC