

Department of Electronics Engineering
K. D. K. College of Engineering, Nagpur

Course Objective
&
Course Outcomes

B.E. 4th Year CBS

VII Semester Electronics Engineering (CBS)

Sr. No.	Name of Course	University Course Code	University Board	SAR Course Code
1	DSP Processor & Architecture	BEENE701T	Electronics	701(T)
2	Embedded System	BEENE702T	Electronics	702(T)
3	Optical Communication	BEENE703T	Electronics	703(T)
4	Advanced Digital System Design	BEENE704T	Electronics	704(T)
5	Elective-I	BEENE705T	Electronics	705(T)
6	DSP Processor & Architecture	BEENE701P	Electronics	706(P)
7	Embedded System	BEENE702P	Electronics	707(P)
8	Advanced Digital System Design	BEENE704P	Electronics	708(P)
9	Project Seminar	BEENE706P	Electronics	709

Name of Course	University Course Code	University Board	SAR Course Code
DSP Processor & Architecture	BEENE701T	Electronics	701(T)

Course Objectives:

1. To study Programmable DSP processors.
2. TO provide an understanding of fundamentals of DSP techniques.
3. To study implementation & application of DSP techniques.
4. To study multi-rate filters.
5. To understand architecture of DSP processor.

Course Outcome:

At the end of the course the students shall be able to:

C701T.1	Learn the fundamentals of DSP processors.
C701T.2	Describe the architecture & addressing modes of fixed point processor TMS320C5X.
C701T.3	Apply instruction set of TMS320C5X and write Programs for processing signals.
C701T.4	Describe the architecture, instruction set & write programs using floating point DSP processor TMS320C54X.
C701T.5	Compare DSP processors like C5X, C54X and C6X, design & implement DSP algorithm using Code Composer Studio of TMS320C6X and Motorola DSP563XX.
C701T.6	Compare the complexity of DFT and FFT algorithm and design decimation filter, interpolation filter & wavelet filter.

Name of Course	University Course Code	University Board	SAR Course Code
Embedded System	BEENE702T	Electronics	702(T)

Course Objectives :

1. To give sufficient background for understanding embedded systems design.
2. To give knowledge of RISC processor.
3. To understand connections of various peripherals with microcontroller based system
4. To study of embedded system design aspects.

Course Outcomes :

At the end of the course the students shall be able to

C702T.1	Identify the Technical & financial issues related to Embedded System design.
C702T.2	Select various types of Processors & Peripherals required to design an embedded processors
C702T.3	Describe Architecture, modes of operations, Exceptions and write assembly language program of ARM Processors.
C702T.4	Describe various communication Protocols used in embedded system
C702T.5	Explain Real Time Operating System Concepts.
C702T.6	Prepare the case studies based on different embedded domain.

Name of Course	University Course Code	University Board	SAR Course Code
Optical Communication	BEENE703T	Electronics	703(T)

Course Objectives :

1. To understand optical fiber technology to sophisticated modern telecommunication systems.
2. Explain the principles and compare single- and multi-mode optical fiber characteristics.
3. To understand the factors affecting the performance of different optical fiber communication systems.
4. Analyze the operation of LEDs, laser diodes, and photo detectors (spectral properties, bandwidth, and circuits) and apply in optical systems.
5. Analyze optical receiver operation.
6. Analyze system design issues including analog, digital, point-to-point optical links and their system consideration.
7. To analyze the operational principle of WDM and application of optical amplifiers.

Course Outcomes :

At the end of the course the students shall be able to:

C703T.1	Demonstrate an understanding of optical fiber communication link, structure, propagation and transmission properties of optical fiber.
C703T.2	Explain the losses; Analyze the propagation characteristics of an optical signal and manufacturing techniques of fiber/cable.
C703T.3	Describe the principles of optical sources and power launching- coupling methods.
C703T.4	Describe the principles of optical detectors and analyze receiver operation.
C703T.5	Design a fiber optic link based on budgets.
C703T.6	To access the different techniques to improve the capacity of the system.

Name of Course	University Course Code	University Board	SAR Course Code
Advanced Digital System Design	BEENE704T	Electronics	704(T)

Course Objectives:

1. To motivate the students to learn basic foundation course in VHDL.
2. To study system modeling using VHDL.
3. It introduces the student fundamental of combination logic design and then to sequential circuits (both synchronous and asynchronous).
4. To study finite state machine using VHDL.
5. To understand system design with PLD'S.
6. To study CPLD and FPGA architecture.

Course Outcomes:

At the end of the course the students shall be able to:

C704T.1	Analyze the level of abstraction and basic VHDL Concept
C704T.2	Optimize complex Combinational and sequential circuits
C704T.3	Testing of digital systems that are reconfigurable.
C704T.4	Develop examples on finite state machines
C704T.5	Simulate and synthesize programming models for digital circuits using ISE and Quartus tools
C704T.6	Experimentation on Hardware / software co-design (FPGA design)

Name of Course	University Course Code	University Board	SAR Course Code
Elective-I Digital Image Processing	BEENE705T	Electronics	705(T)

Course Objectives:

1. Provide the student with the fundamentals of digital image processing.
2. Introduce the students to some advanced topics in digital image processing.
3. Give the students a useful skill base that would allow them to carry out further study in the field of Image processing.

Course Outcome:

At the end of the course the students shall be able to

C705T.1	Understand the basics and fundamentals of Digital Image Processing.
C705T.2	Analyze the histogram and filtering techniques in enhancement of Image.
C705T.3	Compare various Transform Techniques for Image Enhancement.
C705T.4	Understand the Coding and Compression Techniques.
C705T.5	Analyze the Image by Segmentation, Representation and Description.
C705T.6	Demonstrate the application of image processing algorithms to real life problems.

Name of Course	University Course Code	University Board	SAR Course Code
Elective-I Mobile Communication	BEENE705T	Electronics	705(T)

Course Objectives:

1. To understand the basic knowledge about the generation of mobile communication.
2. To familiarize with the recent trends in the field of wireless communication
3. To study and relate the different types of mobile communication system.
4. To study architecture of mobile communication.
5. To get knowledge about applications of mobile communication

Course Outcome:

At the end of the course the students shall be able to:

C705T.1	Elaborate the principle of Mobile Communication and understand cellular system.
C705T.2	Analyze mobile radio environment.
C705T.3	Explain the concept of Switching systems and distinguish modulation techniques of mobile communication.
C705T.4	Differentiate the concept of equalization, diversity and channel coding.
C705T.5	Categorize, distinguish and analyse multiple access technique.
C705T.6	Demonstrate the GSM system.

Name of Course	University Course Code	University Board	SAR Course Code
DSP Processor & Architecture	BEENE701P	Electronics	706(P)

Course Objectives:

1. To study architecture of TMS320C54XX & Motorola DSP563XX
2. To generate basic signals using TMS320C54XX.
3. To study ALP using instruction of TMS processors
4. Implementation of FFT using code Composer studio.
5. To implement Interpolation filter & Decimation filter by Matlab.
6. To design FIR filter & IIR filter using MATLAB and find finite word length effect & cross verify using DSP processor.

Course Outcomes:

At the end of the practical's the students shall be able to:

C701P.1	Study the modern digital signal processing architecture, programming and algorithms using TMS & Motorola processor
C701P.2	Analyze and design different algorithm for signals & filters using TMS320C54XX and TMS320C6713
C701P.3	Analyze various signals in transform domain and Perform real time experiments on processors such as audio and speech processing

Name of Course	University Course Code	University Board	SAR Course Code
Embedded System	BEENE702P	Electronics	707(P)

Course Objectives:

1. To familiar with RARM7 software & KITS.
2. To enhance the ability of logical thinking so that student will be design an algorithm and program for a specific task.

Course Outcomes:

At the end of the practical's the students shall be able to:

C702P.1	Explain different assembly instruction used in ARM Processor.
C702P.2	Write Simple Programs for ARM Processor using Assembly & embedded c Language.
C702P.3	Write Programs for ARM Processor using embedded C Language for different peripheral devices.

Name of Course	University Course Code	University Board	SAR Course Code
Advanced Digital System Design	BEENE704P	Electronics	708(P)

Course Objectives:

1. Design of basic logic gates using VHDL.
2. Design of various combinational circuits using VHDL.
3. Design shift register by placing a component inside the architecture using VHDL
4. Design of sequence detector using Mealy machine/Moore finite state Machine.
5. Design of asynchronous sequential circuit using VHDL
6. Design and implementation of 4bit multiplier using FPGA/CPLD.

Course Outcome:

At the end of the practical's the students shall be able to:

C704P.1	Model, simulate, verify digital model with hardware description language
C704P.2	Learn about modelling of system tested with test bench
C704P.3	Create and simulate FSM using VHDL

Name of Course	University Course Code	University Board	SAR Course Code
Project Seminar	BEENE706P	Electronics	709

Course Outcome:

At the end of the Project Seminar the students shall be able to:

C706P.1	Demonstrate the ability to perform close and critical analysis based on existing literature review
C706P.2	Demonstrate the ability to consider critically the motives and methods of scholarship and the relationship between them.
C706P.3	Formulate the problem for further analysis and design.

VIII Semester Electronics Engineering (CBS)

Sr. No.	Name of Course	University Course Code	University Board	SAR Course Code
1	Micro Electromechanical System & System on Chip	BEENE801T	Electronics	801(T)
2	Computer Communication Network	BEENE802T	Electronics	802(T)
3	CMOS VLSI Design	BEENE803T	Electronics	803(T)
4	Elective-II	BEENE804T	Electronics	804(T)
5	Elective-III	BEENE805T	Electronics	805(T)
6	Computer Communication Network	BEENE802P	Electronics	806(P)
7	CMOS VLSI Design	BEENE803P	Electronics	807(P)
8	Project	BEENE806P	Electronics	808(P)

Name of Course	University Course Code	University Board	SAR Course Code
Micro Electromechanical System & System on Chip	BEENE801T	Electronics	801(T)

Course Objectives are:

1. To understand benefits of miniaturization, types of MEMS, Micro sensors & applications of MEMS devices
2. To study standard micro fabrication techniques, surface & bulk micro machining, wet & Dry etching process Design manufacturing of MEMS device
3. To study chemical & biological transducers, optical transducers thermal transducers
4. To understand major class's components, capacitors, inductors, switches& antennas , RF MEMS components in communications , Space & defense applications.
5. To study microelectronics, micro system packaging
6. To understand system on chip, Microsystems technology & applications

Course Outcome :

At the end of the course the students shall be able to:

C801T.1	Understand working principles of currently available micro sensors actuators benefits of Miniaturization applications of MEMS devices
C801T.2	Understand the basic principles application of micro fabrications process design & manufacturing of MEMS Device surface & bulk micromachining, wet & dry etching process
C801T.3	Understand the conceptual design of devices & system chemical biological optical & thermal transducers .
C801T.4	Understand the basic principles in designing MEMS components such as capacitors , inductors , switches & antennas & MEMS applications in communication, space &defence.
C801T.5	Understand microelectronics , micro system packaging
C801T.6	Consider recent advancements in the field of MEMS & Microsystems technology system on chip &applications of MEMS.

Name of Course	University Course Code	University Board	SAR Course Code
Computer Communication Network	BEENE802T	Electronics	802(T)

Course Objectives

1. To explain the basic concept of computer communication network and Network Layers.
2. To understand the structure of physical layer, IEEE standard, SONET.
3. To understand error control and multiple access technique used in Data Link Layer
4. To explain the addressing techniques.
5. To study hardware aspect of network communication.
6. To explain network security & administration.

Course Outcome :

At the end of the course the students shall be able to

C802T.1	Understand the OSI and TCP/IP reference model with the help of network software protocols with examples.
C802T.2	Describe the types of network topologies and protocols used in physical layer.
C802T.3	Describe the data link layer and demonstrate the methods of subnetting and routing mechanisms.
C802T.4	Demonstrate the protocols used in transport layer and network layer.
C802T.5	Demonstrate the applications of the communication networks available.
C802T.6	Apply the skills of programming for computer network security and its authentication.

Name of Course	University Course Code	University Board	SAR Course Code
CMOS VLSI Design	BEENE803T	Electronics	803(T)

Objectives:

1. Motivating students to learn basics of CMOS VLSI design.
2. To learn CMOS device parameters and characteristics.
3. To detect faults and errors in the design.
4. To learn physical design of logic gates.
5. To Study CMOS processing technology.

Outcome:

At the end of the course the students shall be able to

C803T.1	Develop PMOS and NMOS transistor.
C803T.2	Understand CMOS Inverter.
C803T.3	Implement different combinational logic circuits.
C803T.4	Develop circuit characterization and performance estimation of CMOS./ Experiment on CMOS LOGIC DESIGN
C803T.5	Construct layout for various circuits.
C803T.6	Detect and correct error in VLSI design

Name of Course	University Course Code	University Board	SAR Course Code
Elective-II Satellite Communication	BEENE804T	Electronics	804(T)

Course Objectives:

1. To learn working principle of satellite communication system.
2. To understand the orbital aspects and components of a satellite communication system.
3. To analyze the link budget of a satellite communication system and study of satellite orbits and launching.
4. To get knowledge and relate different components in satellite communication and use them in projects.

Course Outcome:

At the end of the course the students shall be able to

C804T.1	Understand the basics and fundamentals of Satellite Communication.
C804T.2	Design the Satellite Link with various parameters.
C804T.3	Compare the Data Communication with FDMA, TDMA and CDMA Multiple Access.
C804T.4	Analyze the technical competence in Atmospheric effect in Satellite Communication engineering
C804T.5	Identify the problems based on Data Communication Errors, Detection and Correction.
C804T.6	Understand the Earth Station Technology and its design.

Name of Course	University Course Code	University Board	SAR Course Code
Elective-III DATA COMPRESSION & ENCRYPTION	BEENE805T	Electronics	805(T)

Course Objectives:

1. To understand the different text compression technique.
2. To study the various audio compression scheme.
3. To verify different video compression & image compression methods.
4. To have the knowledge of various encryption technique.
5. To acquire the information about different authentication technique.

Course Outcome:

At the end of the course the students shall be able to

C805T.1	Describe and apply various types of Text compression techniques and evaluate the performance of the coding techniques.
C805T.2	Explain various Audio compression techniques and MPEG audio compression standard.
C805T.3	Describe various lossless and lossy techniques of Image and Video compression and MPEG industry standard.
C805T.4	Describe the different conventional encryption and decryption techniques and compare it based on its performance parameters.
C805T.5	Describe different algorithms under Public Key Cryptography and methods to provide the authentication.
C805T.6	Explain network security design issues to protect a computer system from security threads and also ethical issues related to computer and network security.

Name of Course	University Course Code	University Board	SAR Course Code
Computer Communication Network	BEENE802P	Electronics	806(P)

Course Objectives:

1. To study the various physical equipments used for networking based on different topology.
2. To study network simulator & get familiar with NS2.
3. To design the network model with number of nodes for TCP and UDP network protocol using NS2.
4. To perform data transmission using Ping protocol, tracert, IP configuration & hub.
5. To design the IP addresses to the different nodes for data communication.
6. To perform PC to PC Communication using RS-232 port.

Course Outcome:

At the end of the practical's the students shall be able to:

C802P.1	To analyse computer networks simulation results using ns2.
C802P.2	Design a computer network including for certain media types, and demonstrate the network performance.
C802P.3	Perform basic configurations on routers and Ethernet switches and demonstrate programming skills of network communication.

Name of Course	University Course Code	University Board	SAR Course Code
CMOS VLSI Design	BEENE803P	Electronics	807(P)

Course Objectives:

1. To learn CMOS device parameters and characteristics.
2. To implement different combinational circuits using CMOS.
3. To implementation of different logic equations.
4. To implementation of sequential circuits.
5. To learn physical design of logic gates.
6. To Study CMOS processing technology.

Course Outcome:

At the end of the practical's the students shall be able to:

C803P.1	Demonstration characteristic of NMOS/PMOS.
C803P.2	Implementation different combinational logic circuits using CMOS.
C803P.3	Design layout for various circuits.

Name of Course	University Course Code	University Board	SAR Course Code
Project	BEENE806P	Electronics	808(P)

Course Outcome:

At the end of the Project the students shall be able to:

C806P.1	Define the problem based on knowledge of Electronics Engineering
C806P.2	Study and analyze the identified problem
C806P.3	Design and construct the module in group based on software / hardware and prepared a report