



**SCHEME OF STUDIES & EXAMINATIONS**

Department: Electronics & Communication Engineering – 8<sup>th</sup> Semester

Sr. No	Course No.	Course Title	Teaching Schedule			Marks of class work	Examination Marks		Total	Credit	Duration of Exam
			L	T	P		Theory	practical			
1	ECE402B	WIRELESS COMMUNICATION SYSTEMS	3	1	-	25	75	-	100	4	3
2	ECE404B	DATA COMMUNICATION AND NETWORK(ECE,EEE)	3	1	-	25	75	-	100	4	3
3		DEPT. ELECTIVE I	4	-	-	25	75	-	100	4	3
4		DEPT. ELECTIVE II	4	-	-	25	75	-	100	4	3
5	ECE424B	DATA COMMUNICATION AND NETWORK LAB	-	-	2	20	-	30	50	1	3
6	ECE 431 B	PROJECT	-	-	8	75	-	125	200	8	3
7	ECE438B	SEMINAR	-	-	2	50	-	-	50	2	-
8	GPEC402B	GENERAL FITNESS FOR THE PROFESSION	-	-	-	-	-	100	100	4	3
<b>Total</b>			14	2	12	245	300	255	800	31	

**\* List of Open Electives**

S.NO	CODE	TITLE	S.NO	CODE	TITLE
1	ECE406B	NEURAL NETWORK & FUZZY LOGIC	1	ECE416B	DIGITAL IMAGE PROCESSING
2	ECE408B	ELECTRONICS MATERIAL AND NANO TECHNOLOGY	2	ECE418B	RELIABILITY ENGINEERING
3	ECE410B	BIOMEDICAL ELECTRONICS	3	ECE420B	TELECOMMUNICATION SWITCHING SYTEM
4	ECE412B	OPTICAL COMMUNICATION	4	ECE426B	EMBEDDED SYSTEM DESIGN
5	ECE414B	RADAR AND SONAR ENGINEERING	5	ECE428B	POWER SYSTEM STABILITY AND FACTS

**Note:**

- Every student has to participate in the sports activities. Minimum one hour is fixed for sports activities either in the morning or evening. Weight-age of Moral Values & Ethics and Sports are given in General Proficiency Syllabus.
- Students will be permitted to opt for any one elective run by the other department (i.e. open electives) and for any two electives, one from Elective-I and one from Elective-II run by the department. However, the department shall offer those elective for which they have expertise. The choice of the students for any elective shall not be binding for the department to offer, if the department does not have expertise. The minimum strength of the students should be 20 to run an elective course.
- Assessment of Professional Training-II, undergone at the end of VI semester, will be based on seminar, viva-voce, report and certificate of Professional Training obtained by the student from the industry, institute, research lab, training center etc
- The students will be allowed to use non-programmable scientific calculator. However, sharing/exchange of calculator is prohibited in the examination.



**SYLLABUS: B Tech (ECE)**

**Department: ELECTRONICS AND COMMUNICATION – 8<sup>th</sup> Semester**

**Subject: DATA COMMUNICATION AND NETWORK (Theory)**

**Subject Code: ECE404B**

**Detailed Content**

**Unit No.1 Data Communication and Networks:**

- Topic No.1: Components of data communication networks
- Topic No.2: Data Representation, Data Flow
- Topic No.3: Guided and Unguided Media
- Topic No.4: Distributed Processing
- Topic No.5: Network Criteria
- Topic No.6: Physical Structure
- Topic No.7: Network Model: Category of Networks
- Topic No.8: Analog and Digital Data, Analog and Digital Signals
- Topic No.9: Periodic and Non Periodic Signals
- Topic No.10: Transmission Impairments-Attenuation, Distortion, Noise,
- Topic No.11: Performance: Bandwidth, Throughput, Latency
- Topic No.12: Bandwidth-Delay Product, Jitter

**Unit No.2 Digital Transmission:**

- Topic No.13: Digital to digital Conversion-Line Coding,
- Topic No.14: Line Coding Schemes: Block Coding, Scrambling
- Topic No.15: Transmission modes-Parallel Transmission and Serial Transmission
- Topic No.16: Frequency Division Multiplexing, Wavelength division Multiplexing,
- Topic No.17: Synchronous Time division multiplexing, Statistical Time Division multiplexing

**Unit No.3 Switching:**

- Topic No.18: Circuit Switched Networks-Three Phases
- Topic No.19: Efficiency Delay & Datagram Networks-Routing table
- Topic No.20: Efficiency delay and Virtual Circuit Networks-Addressing
- Topic No.21: Three Phases, Efficiency Delay in Virtual Circuit Networks
- Topic No.22: Framing-Fixed Size Framing, Variable Sized framing
- Topic No.23: Flow and Error Control-Flow Control, Error control
- Topic No.24: Protocols: Noiseless Channels-Simplest protocol, Stop and Wait Protocol
- Topic No.25: Noisy Channels-Stop and Wait Automatic Repeat Request
- Topic No.26: Go Back n Automatic Repeat request, Selective Repeat Automatic Repeat request
- Topic No.27: Piggy Backing

**Unit No.4 Network Models:**

- Topic No.28: Layered Tasks-Sender, receiver and Carrier
- Topic No.29: The OSI Model-Layered Architecture
- Topic No.30: Peer to peer processes, Encapsulation
- Topic No.31: Layers in the OSI: Model-Physical Layered, Data Link layer, Network layer, Transport layer, Session layer, Presentation layer, Application layer
- Topic No.32: Summary of layers
- Topic No.33: Introduction to TCP-IP and Internetworking
- Topic No.34: IEEE Standards-Data Link Layer, Physical layer
- Topic No.35: Standard Ethernet-Mac Sub layer, Physical layer
- Topic No.36: Changes in the standard bridged Ethernet, Switched Ethernet, Full duplex Ethernet
- Topic No.37: Fast Ethernet-Mac sub layer, Physical layer



# PM

## COLLEGE OF ENGINEERING

A Unit of Puran Murti Educational Society  
Approved by AICTE, Ministry of HRD, Govt. of India,  
Affiliated to Deenbandhu Chhotu Ram University of Science & Technology

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

### Text Books:

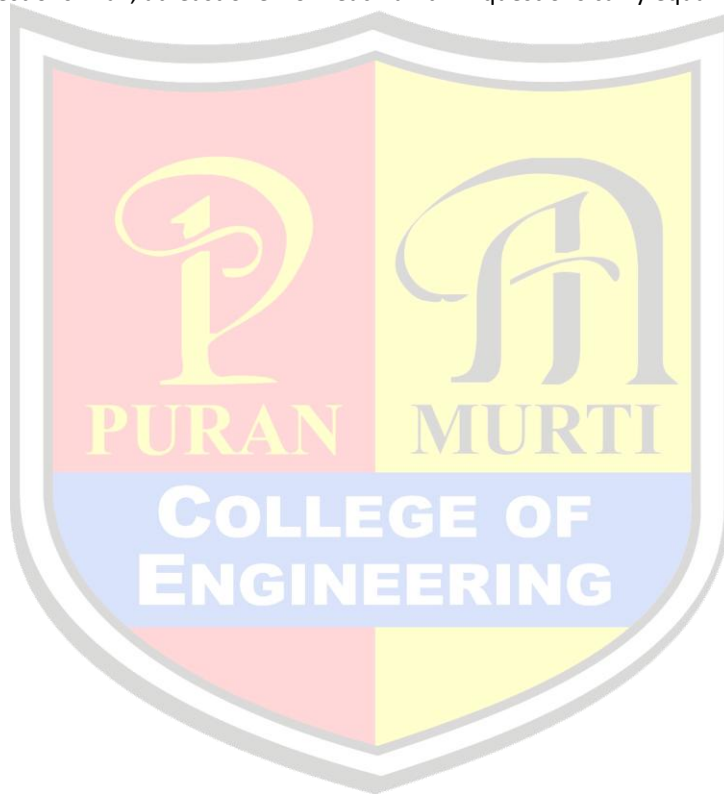
1. Data Communication and Networking by Behrouz.A.Forouzan(TMh Publication)

### Reference Books:

1. Computer Networks by William Stallings

### NOTE:

In the Semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all, at least one from each unit. All questions carry equal marks.





**SYLLABUS: B Tech (ECE)**

**Department: ELECTRONICS AND COMMUNICATION – 8<sup>th</sup> Semester**

**Subject: WIRELESS COMMUNICATION SYSTEMS (Theory)**

**Subject Code: ECE402B**

**Detailed Content**

**Unit No.1 Introduction to Wireless Communication Systems:**

- Topic No.1: Evolution of Mobile Radio Communications
- Topic No.2: Introduction of First Generation (1G), Second Generation (2G), Generation (2.5G), Third Generation (3G)
- Topic No.3: Evolution from 2G To 3G then Fourth Generation (4G)
- Topic No.4: Examples of Wireless Communication Systems
- Topic No.5: Difference between Fixed Telephone Network and Wireless Telephone Network
- Topic No.6: Wireless Local Loop [WLL], Wireless Local Area Networks (WLAN)
- Topic No.7: Personal Area Network (PAN), Bluetooth
- Topic No.8: Introduction of Frequency Reuse and Channel Assignment Strategies
- Topic No.9: Hand-Off Strategies
- Topic No.10: Interference and System Capacity
- Topic No.11: Trunking and Grade of Service
- Topic No.12: Improving Coverage and Capacity in Cellular Systems

**Unit No.2 Mobile Radio Propagation: Large Scale Path Loss:**

- Topic No.13: Introduction to Radio Wave Propagation
- Topic No.14: Free Space Propagation Model
- Topic No.15: Practical Link Budget Design Using Path Loss Models
- Topic No.16: Outdoor Propagation Models & Indoor Propagation Models
- Topic No.17: Signal Penetration into Buildings
- Topic No.18: Small Scale Multipath Propagation
- Topic No.19: Impulse Response Model of a Multipath Channel
- Topic No.20: Small Scale Multipath Measurements
- Topic No.21: Parameters of Mobile Multipath Channels
- Topic No.22: Types of Small Scale Fading
- Topic No.23: Rayleigh and Ricean Distributions

**Unit No.3 Equalization and Diversity:**

- Topic No.24: Fundamentals of Equalization,
- Topic No.25: Equalizer in a Communication Receiver :Linear Equalizer, Non Linear Equalization
- Topic No.26: Diversity Techniques
- Topic No.27: Rake Receiver
- Topic No.28: Interleaving
- Topic No.29: Introduction of Frequency Division Multiple Access (FDMA), Time Division Multiple Access (TDMA)
- Topic No.30: Spread Spectrum Multiple Access, Space Division Multiple Access (SDMA)
- Topic No.31: Capacity of Cellular System

**Unit No.4 Wireless Networking:**

- Topic No.32: Introduction to Wireless Networks,
- Topic No.33: Development of Wireless Networks,
- Topic No.34: Traffic Routing in Wireless Networks,
- Topic No.35: Wireless Data Services & Common Channel Signaling,
- Topic No.36: Integrated Services Digital Network (ISDN),
- Topic No.37: Signaling System No.7 (SS 7)
- Topic No.38: Personal Communication: Services/Networks.(PCS/PCN)
- Topic No.39: Global System for Mobile (GSM)
- Topic No.40: Cdma Digital Cellular Standard (IS-95)
- Topic No.41: GPRS & EDGE,W-Cdma,cdma2000



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### Text Books :

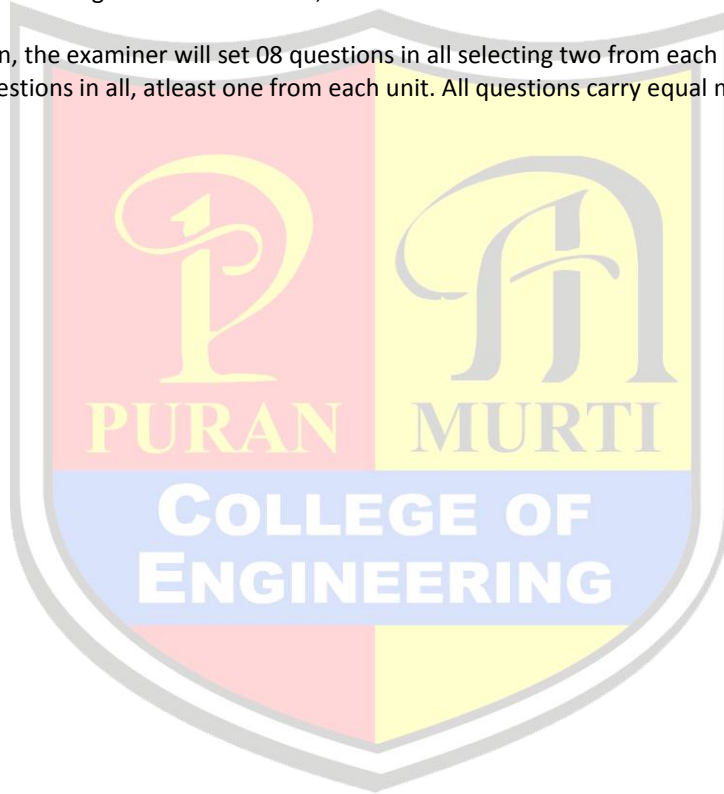
1. T.S. Rappaport, "Wireless Communication, Principles & Practice," PHI .
2. Rajeshwar Dass, "Wireless Communication Systems," I.K International Pvt. Ltd
3. Jochen Schiller, "Mobile Communication," Pearson Education

### Reference Books:

1. William, C Y Lee, "Mobile Cellular Telecommunications," Mc Graw Hill
2. Dr. Kamilo Feher "Wireless and Digital Communication," PHI

### NOTE:

In the Semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all, atleast one from each unit. All questions carry equal marks.





**SYLLABUS: B Tech (ECE)**

**Department: ELECTRONICS AND COMMUNICATION – 8<sup>th</sup> Semester**

**Subject: OPTICAL COMMUNICATION (Theory)**

**Subject Code: ECE412B**

**Detailed Content**

**Unit No.1 Introduction to Optical communication System:**

- Topic No.1: Electromagnetic Spectrum used for optical communication
- Topic No.2: Block Diagram of optical Communication System
- Topic No.3: Basics of transmission of light rays
- Topic No.4: Advantages of optical fiber communication
- Topic No.5: Types of fibers : Step Index Fibers, Graded index Fibers, Single mode fibers (Cut off wavelength, Mode field Diameter effective Refractive index), Multimode fibers

**Unit No.2 Attenuation:**

- Topic No.6: Material losses in Silica Glass Fibers (Intrinsic and Extrinsic)
- Topic No.7: Linear Scattering losses(Rayleigh Scattering, Mie scattering)
- Topic No.8: Non Linear scattering
- Topic No.9: Losses (SBS, SRS),Fiber Bend loss
- Topic No.10: Chromatic Dispersion (Material Dispersion, Waveguide Dispersion)
- Topic No.11: Intermodal Dispersion (Multimode Step index fiber Multimode Graded Index fiber)
- Topic No.12: Dispersion Modified single mode fibers (Dispersion Shifted and Dispersion Flattened Fibers)

**Unit No.3 Optical Fiber Connections:**

- Topic No.13: Fiber alignment and joint loss (Multimode, Single mode)
- Topic No.14: Fiber Splices (Fusion),Fiber Couplers (Three and Four port Couplers)
- Topic No.15: Introduction to absorption and Emission Of radiation,
- Topic No.16: Characteristics of Optical sources:LED power and Efficiency
- Topic No.17: LED Structures (Surface and Edge Emitting)
- Topic No.18: LED Characteristics (Optical O/P power,O/P Spectrum)
- Topic No.19: Modulation Bandwidth

**Unit No.4 Optical Sources (LASER):**

- Topic No.20: Einstein Relation
- Topic No.21: Population Inversion
- Topic No.22: Optical Feedback
- Topic No.23: Laser Oscillation,Threshold condition for laser oscillation
- Topic No.24: Comparison of LED and Laser as an Optical Source.
- Topic No.25: Introduction of Quantum Efficiency & Responsively
- Topic No.26: Long wavelength cut off-I-N photodiode
- Topic No.27: Avalanche Photodiode
- Topic No.28: Benefits and drawbacks of Avalanche photodiodes
- Topic No.29: Multiplication Factor

Study Scheme				Evaluation Scheme			Total Marks
L	T	P	Credits	Internal Assessment	External Assessment (Examination)		
				Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

**Text Books:**

1. Fiber Communication By JOHN.M. SENIOR (Pearson Education).

**Reference Books:**

1. Optical Communication By G. Keiser(Tata Mc Graw Hill)
2. Essentials of Modern optical Fiber Communication By REINHOLD NOE(Springer)
3. Fiber Optic Communication By Palais(Pearson)



**SYLLABUS: B Tech (ECE)**

**Department: ELECTRONICS AND COMMUNICATION – 8<sup>th</sup> Semester**

**Subject: EMBEDDED SYSTEMS DESIGN (Theory)**

**Subject Code: ECE426B**

**Detailed Content**

**UNIT No.1 Introduction of embedded systems design:**

- Topic No.1: Embedded Systems Design: Definition, Issues, challenges and Trends
- Topic No.2: Current events and emerging technologies
- Topic No.3: Introduction to AVR microcontroller, Features of AVR family microcontrollers
- Topic No.4: Different types of AVR microcontroller
- Topic No.5: Architecture & Memory
- Topic No.6: Access and instruction execution
- Topic No.7: Pipelining
- Topic No.8: Program memory considerations
- Topic No.9: Addressing modes
- Topic No.10: CPU registers
- Topic No.11: Instruction set & Simple operations

**Unit No.2 Features of AVR microcontroller:**

- Topic No.12: Timer:Control Word
- Topic No.13: Mode of timers
- Topic No.14: Simple programming
- Topic No.15: Generation of square wave
- Topic No.16: Interrupts: Introduction
- Topic No.17: Control word Simple Programming
- Topic No.18: Generation of waveforms using interrupt, Serial interface using interrupt
- Topic No.19: Watch-dog timer
- Topic No.20: Power-down modes of AVR microcontroller,
- Topic No.21: UART & SRAM

**Unit No.3 Applications based on avr microcontroller:**

- Topic No.22: Applications based on RF Card
- Topic No.23: Graphical LCD,Color LCD
- Topic No.24: Zigbee, DTMF
- Topic No.25: GSM & GPS
- Topic No.26: Smart Card: RF ID,Touch Screen,
- Topic No.27: Bluetooth
- Topic No.28: Data Cables:RS-232,RS-485,
- Topic No.29: SPI, IIC, ISA,CAN

**Unit No.4 Software requirements for embedded systems design:**

- Topic No.30: Softwares: Assemblers, Compilers, Linkers, Loaders, Debuggers
- Topic No.31: Profilers and Test Coverage Tools Utilities like make, Ranlib, Obj copy and obj dump,
- Topic No.32: Configuring and Building GNU Cross-Tool chain Building RTOS / EOS Image for Target Hardware.
- Topic No.33: Embedded Operating Systems,
- Topic No.34: Real Time Operating System (RTOS)
- Topic No.35: Writing Time and Space Sensitive Programs,Writing Device Drivers,
- Topic No.36: Interrupt Handling in C
- Topic No.37: Combining C with Assembly.

Study Scheme				Evaluation Scheme			Total Marks
L	T	P	Credits	Internal Assessment	External Assessment (Examination)		
Max. Marks	Max. Marks	Exam Duration					
3	1	-	4	25	75	3 hours	100

**Text Books :**

1. Programming & Customizing the AVR Microcontroller, Dhananjay V. Gadre, Tata McGraw-Hill Pub. Co. Ltd., New Delhi.



**SYLLABUS: B Tech (ECE)**

**Department: ELECTRONICS AND COMMUNICATION – 8<sup>th</sup> Semester**

**Subject: Data communication and network lab**

**Subject Code: ECE424B**

**Detailed Content**

**List of experiments:**

- 1 : To study different types of transmission media
- 2 : To study Quadrature Phase Shift Keying Modulation.
- 3 : To study Quadrature Amplitude Modulation.
- 4 : To Study 16 Quadrature Amplitude Multiplexing.
- 5 : To Study Serial Interface RS-232 and its applications.
- 6 : To study the Parallel Interface Centronics and its applications.
- 7 : To configure the modem of a computer.
- 8 : To make inter-connections in cables for data communication in LAN.
- 9 : To install LAN using Tree topology.
- 10 : To install LAN using STAR topology.
- 11 : To install LAN using Bus topology.
- 12 : To install LAN using Token-Ring topology
- 13 : To install WIN NT
- 14 : To configure a HUB/Switch.

**Note:-**

- 1 Total ten experiments are to be performed in the semester
- 2 At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed and set by the concerned institution as per the scope of the syllabus.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week		Credits	Internal Assessment	External Assessment (Examination)			
L	T		P	Max. Marks	Max. Marks	Exam Duration	
-	-	2	1	20	30	3 hours	50





**SYLLABUS: B Tech (ECE)**

**Department: ELECTRONICS AND COMMUNICATION – 8<sup>th</sup> Semester**

**Subject: Project**

**Subject Code: ECE431B**

**Detailed Content**

The project started in VII Semester will be completed in VIII Semester and will be evaluated through a panel of examiners consisting of the following:

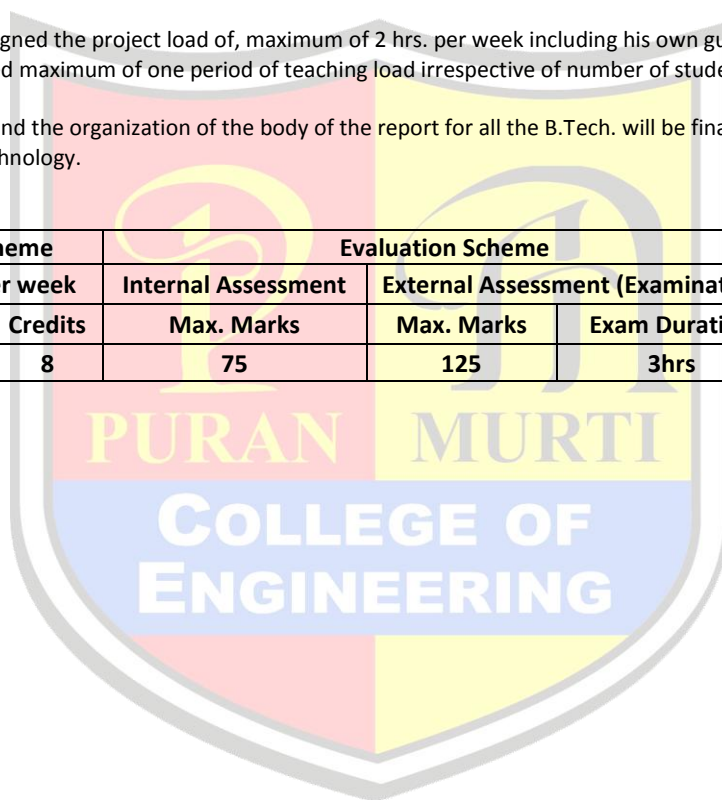
Head/ Chairperson of Department : Chairperson  
Project coordinator : Member  
External examiner : To be appointed by the University

The student will be required to submit two copies of his/her project report to the department for record (one copy each for the department and participating teacher).

Project coordinator will be assigned the project load of, maximum of 2 hrs. per week including his own guiding load of one hr. However, the Guiding teacher will be assigned maximum of one period of teaching load irrespective of number of students/groups under him/her.

The format of the cover page and the organization of the body of the report for all the B.Tech. will be finalized and circulated by the Dean, Faculty of Engineering and Technology.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week		P	Credits	Internal Assessment	External Assessment (Examination)		
L	T			Max. Marks	Max. Marks	Exam Duration	
-	-	8	8	75	125	3hrs	200





### SYLLABUS: B Tech (ECE)

Department: ELECTRONICS AND COMMUNICATION – 8<sup>th</sup> Semester

Subject: Seminar

Subject Code: ECE438B

#### Detailed Content

The objectives of the course remains

- To learn how to carry out literature search
- To learn the art of technical report writing
- To learn the art of verbal communication with the help of modern presentation techniques

A student will select a topic in emerging areas of Engineering & Technology and will carry out the task under the observation of a teacher assigned by the department.

He/ She will give a seminar talk on the same before a committee constituted by the chairperson the department. The committee should comprise of three faculty members from different specializations. The teacher associated in the committee will be assigned 2 hours teaching load per week.

However, guiding students' seminar will not be considered towards teaching load.

The format of the cover page and the organization of the body of the report for all the B.Tech. will be finalized and circulated by the Dean, Faculty of Engineering and Technology.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week		Credits	Internal Assessment	External Assessment (Examination)			
L	T		P	Max. Marks	Max. Marks	Exam Duration	
-	-	2	2	50	-	-	50

COLLEGE OF  
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**SYLLABUS: B Tech (ECE)**

**Department: ELECTRONICS AND COMMUNICATION – 8<sup>th</sup> Semester**

**Subject: General fitness for the profession**

**Subject Code: GPEC402B**

**Detailed Content**

The purpose of this course is to inculcate a sense of professionalism in a student along with personality development in terms of quality such as receiving, responding, temperament, attitude and outlook. The student efforts will be evaluated on the basis of his/ her performance /achievements in different walks of life.

The evaluation will be made by the committee of examiners constituted as under:

1. Dean, Faculty of Engineering & Technology/ Director /Principal of affiliated college : Chairperson
2. Chairperson of the department : Member
3. External expert : Appointed by the university

**A. The student will present a written report before the committee with following in view:**

The student will present before the committee his/her achievements during the current academic session in the form of a written report highlighting followings:

- I. Academic Performance -----
- II. Extra Curricular Activities / Community Service, Hostel Activities
- III Technical Activities / Industrial, Educational tour
- IV Sports/games

**(12 Marks)**

**(12 Marks)**

**(16Marks)**

**Note:** Report submitted by the students should be typed on both sides of the paper.

- B. A student will support his/her achievement and verbal & communicative skill through presentation before the examiners.

**(40 Marks)**

- C. Faculty Counselor Assignment

**(20 Marks)**

It will be the duty of the student to get evaluated by respective faculty counselor and to submit the counselor assessment marks in a sealed envelope to the committee.

A counselor will assess the student which reflects his/her learning graph including followings:

1. Discipline throughout the year
2. Sincerity towards study
3. How quickly the student assimilates professional value system etc.
4. Moral values & Ethics- Syllabus (one lecture/week on the topics of Human values/Ethics is to be delivered)

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
-	-	-	4	-	100	3hrs	100