



# PM POLYTECHNIC

A Unit of Puran Murti Educational Society  
Approved by AICTE, Ministry of HRD, Govt. of India,  
Affiliated to State Board of Technical Education, Panchkula, Haryana

## SCHEME FOR SIXTH SEMESTER (ELECTRONICS & COMMUNICATION ENGINEERING)

Sr. No.	Subject	Study Scheme			EVALUATION SCHEME						Total Marks
					INTERNAL ASSESSMENT		EXTERNAL ASSESMENT (EXAMINATION)				
		Theory	Practical	Written Paper		Practical					
		Max. Marks	Max. Marks	Max. Marks	Hrs.	Max. Marks	Hrs.				
6.1	a) Medical Electronics b) V.L.S.I. System Design	4	-	3	25	25	100	3	50	3	200
6.2	Maintenance of Computer System	4	-	3	25	25	100	3	50	3	200
6.3	Wireless and Mobile Communication	4	-	3	25	25	100	3	50	3	200
6.4*	Entrepreneurship Development & Management	3	-	-	50	-	100	3	-	-	150
6.5	Major Project Work	-	-	9	-	50	-	-	100	3	150
6.6*	Employability Skills - II	-	-	2	-	25	-	-	50	3	75
# Student Centred Activities		-	-	5	-	25	-	-	-	-	25
<b>Total</b>		<b>15</b>	<b>-</b>	<b>25</b>	<b>125</b>	<b>175</b>	<b>400</b>	<b>-</b>	<b>300</b>	<b>-</b>	<b>1000</b>

\* **Common** with other diploma programmes

# Student Centred Activities will comprise of co-curricular activities like extension lectures, library studies, games, hobby clubs e.g. photography, painting, singing, seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, Civil Defence/Disaster Management activities etc.



## SYLLABUS: Polytechnic (ECE)

Department: Electronics & Communication Engineering – 6<sup>th</sup> Semester

Subject: Medical Electronics (Theory)

Subject Code: 121061 A

### Detailed Contents

#### Unit No.1 Anatomy and physiology

- Topic No.1: Elementary ideas of cell structure
- Topic No.2: Heart and circulatory system.
- Topic No.3: Central nervous system
- Topic No.4: Muscle action
- Topic No.5: Respiratory system
- Topic No.6: Body temperature and reproduction system

#### Unit No. 2 Overview of Medical Electronics Equipments

- Topic No.7: Classification, application and specifications therapeutic and clinical laboratory equipment
- Topic No.8: Method of operation of these instruments

#### Unit No. 3 Electrodes

- Topic No.9: Bioelectric signals
- Topic No.10: Bio electrodes
- Topic No.11: Electrode, Electrode tissue interface
- Topic No.12: Contact impedance
- Topic No.13: Types of Electrodes
- Topic No.14: Electrodes used for ECG, EEG

#### Unit No. 4 Transducers

- Topic No.15: Typical signals from physiological parameters
- Topic No.16: Pressure transducer
- Topic No.17: Flow transducer, temperature transducer
- Topic No.18: Pulse sensor, respiration sensor

#### Unit No.5 Bio Medical Recorders

- Topic No.19: Block diagram description and application of following instruments-ECG Machine
- Topic No.20: EEG Machine, EMG Machine

#### Unit No.6 Patient Monitoring Systems

- Topic No.21: Heart rate measurement
- Topic No.22: Pulse rate measurement, Respiration rate measurement, Blood pressure measurement
- Topic No.23: Principle of defibrillator and pace mark
- Topic No.24: Use of Microprocessor in patient monitoring
- Topic No.25: Blood Sugar Measurement

#### Unit No.7 Safety Aspects of Medical Instruments

- Topic No.26: Gross current shock, Micro current shock
- Topic No.27: Special design from safety consideration
- Topic No.28: Safety standards

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
4	-	-	25	-	100	3	-	-	



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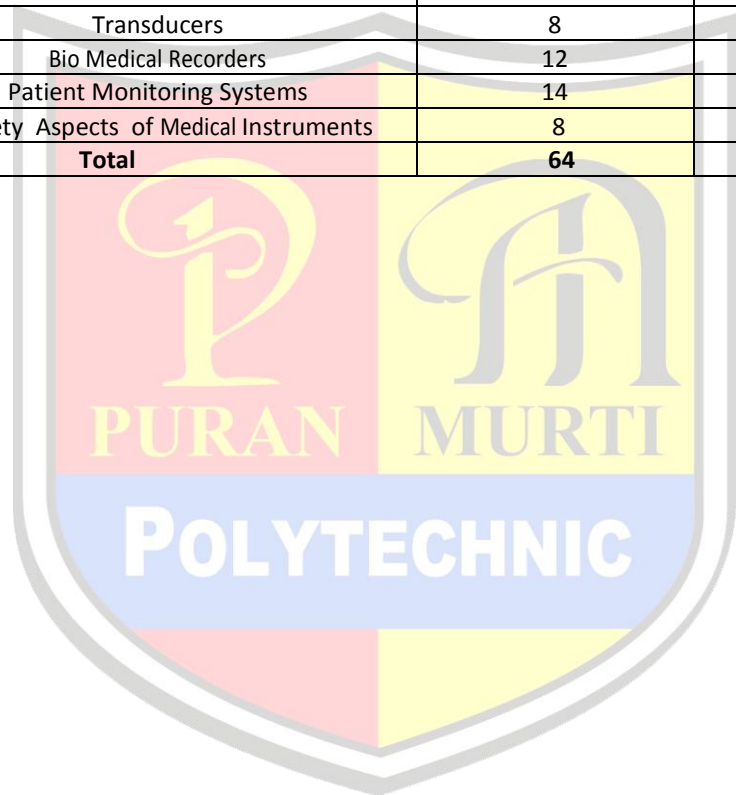
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### RECOMMENDED BOOKS

1. Handbook of biomedical Instrumentation by RS Khandpur
2. Biomedical Instrumentation by Cromwell,
3. Modern Electronics Equipment by RS Khndpur, TMH, New Delhi
4. Medical Electronics by Vikas & Yogesh, Ishan publication
5. Introduction to BioMedical Electronics by Edward J. Perkstein; Howard Bj, USA

### SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING PAPER SETTER

Sr.No.	Unit Name	Time Allotted (Hrs)	Marks Allotted (%)
1	Anatomy and physiology	8	13
2	Overview of Medical Electronics Equipments	6	10
3	Electrodes	8	10
4	Transducers	8	10
5	Bio Medical Recorders	12	20
6	Patient Monitoring Systems	14	25
7	Safety Aspects of Medical Instruments	8	12
<b>Total</b>		<b>64</b>	<b>100</b>





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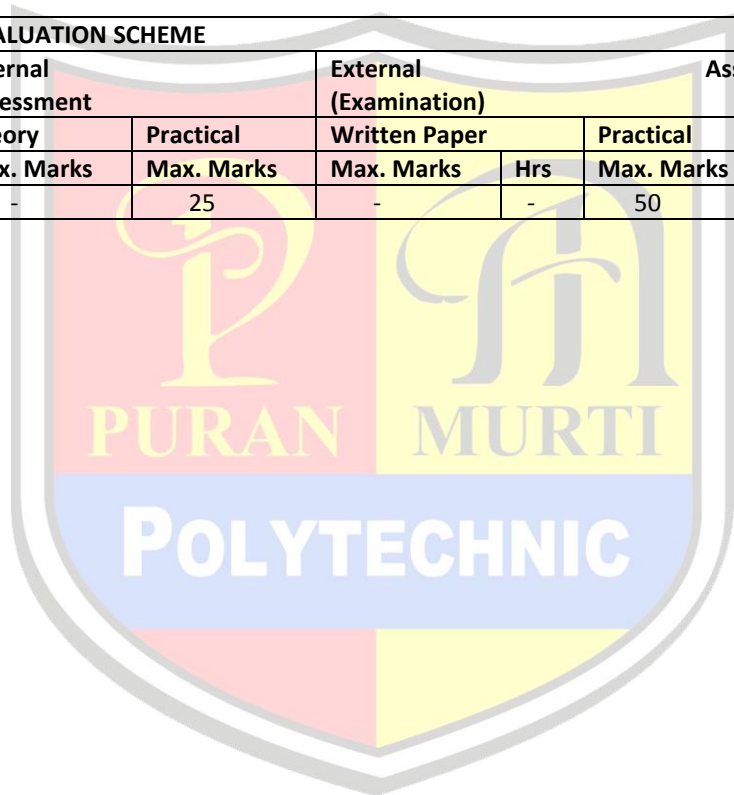
**Subject: Medical Electronics (Practical)**

**Subject Code: 121061 A**

## LIST OF PRACTICALS

1. To operate and feminization with:
  - (a) B.P. Apparatus
  - (b) ECG Machine
2. To measure the concentration of blood sugar with Glucometer (fasting, P.P., Random)
3. To measure the
  - (a) Respiration rate
  - (b) Pulse rate
4. Installation of small medical equipment in laboratories of Hospital precautions to be taken.
5. Study of large medical equipment in Hospital / Nursing home.
6. Operation and use of Electro-physiotherapy
7. Maintenance schedule for different equipment and their records in a hospital

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	3	-	25	-	-	50	3	75





### Detailed Contents

#### Unit No.1 Overview of VLSI

- Topic No. 1: Introduction to Computer-aided design tools for digital systems
- Topic No. 2: Hardware-description languages
- Topic No. 3: Introduction to VHDL, Data objects, Classes and data types, Operators, Overloading, Logical operators.
- Topic No. 4: Types of delays, Entity and Architecture declaration
- Topic No. 5: Introduction to behavioral, dataflow and structural models

#### Unit No. 2 VHDL Statements

- Topic No.6: Assignment statements, sequential Statements and process
- Topic No.7: Conditional statements, Case statements
- Topic No.8: concept and use of Concurrent statements

#### Unit No.3 Combinational Circuit Design

- Topic No.9: VHDL models and simulation of combinational circuits
- Topic No.10: Multiplexers, Encoders, Decoders
- Topic No.11: Code converters, Comparators, Implementation of Boolean functions etc

#### Unit No.4 Sequential Circuit Design

- Topic No.12: VHDL Models and simulation of sequential circuits
- Topic No.13: Shift registers, Counters etc

#### Unit No. 5 Introduction to CPLDs and FPGAs

- Topic No.14: Programmable logic devices: ROM, PLAs, GAL, PEEL, CPLDs
- Topic No.15: FPGA. FPAA (Field Programmes Analog Array)

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
4	-	-	25	-	100	3	-	-	125

#### RECOMMENDED BOOKS

1. VLSI Design by Geiger, Tata McGraw Hill Education Pvt Ltd, New Delhi
2. EEE Standard VHDL Language reference Manual(1993)
3. "Digital System Design using VHDL": Charles. H. Roth; PWS(1998)
4. VHDL-IV Edition: Perry; TMH (2002)
5. VLSI system design- by Komal Gupta Ishan Publication
6. Xilinx Synthesis Software (web pack) freely available on internet. On Xilinx.com
7. VLSI System Design is wind software for designing (System Designing)

#### INSTRUCTIONAL STRATEGY

This subject is very important for designing Digital Systems. For this, the students need to have strong base understanding of fundamental concepts of digital electronics. The teacher is required to lay more emphasis on programming practice in VHDL.

#### SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING PAPER SETTER

Sr.No.	Unit Name	Time Allotted (Hrs)	Marks Allotted (%)
1	Overview of VLSI	12	20
2	VHDL Statements	12	15
3	Combinational Circuit Design	14	25
4	Sequential Circuit Design	14	25
5	Introduction to CPCLDs and FPGAS	12	15
<b>Total</b>		<b>48</b>	<b>100</b>



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**Subject: VLSI System Design (Practical)**

**Subject Code: 121061 B**

## LIST OF PRACTIALS

### Combinational Design Exercises

1. Design of Gates
  - a. Design of AND gate
  - b. Design of OR gate
  - c. Design of XOR gate
2. Design of XOR gate using other basic gates
3. Design of 2:1 Mux using other basic gates
4. Design of 2 to 4 Decoder
5. Design of Half Adder, Full Adder, Half Subtractor, Full Subtractor
6. Design of 3:8 Decoders
7. Design of 8:3 Priority Encoders
8. Design of 4 Bit Binary to Grey code Converter
- 9 Familiarization of VLSI and Tools with software line Ex-VLSI

### Sequential Design Exercises Using VHDL

1. Design of Synchronous 8-bit Johnson Counter
2. Design of ALU (Additional, subtraction, Multiplication, Division)

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment			External (Examination)			
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	3	-	25	-	-	50	3	75





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**Subject: Maintenance of Computer System (Theory)**

**Subject Code: 121062**

**Detailed Contents**

**Unit No.1 Mother Board**

- Topic No.1: Introduction to different type of mother boards
- Topic No.2: Single Board Based System,
- Topic No.3: Block diagram of motherboard.
- Topic No.4: Installation of Computer System

**Unit No.2 Buses and Ports**

- Topic No.5: Different type of Buses PCI,
- Topic No.6: SCSI and Serial and Parallel ports (COM ports) Ports
- Topic No.7: LPTI, USB, RS 232 C
- Topic No.8: use of computer for instrumentation

**Unit No.3 Memory**

- Topic No.9: Principle and construction of Hard Disk Drive
- Topic No.10: Floppy Disk Controller & Hard Disk Controller
- Topic No.11: Pen Drives
- Topic No.12: common faults with hard disk drive and floppy disk
- Topic No.13: RAM Module

**Unit No.4 Keyboard and Mouse**

- Topic No.14: Block Diagram of keyboard Controller
- Topic No.15: keyboard switches
- Topic No.16: keyboard faults
- Topic No.17: mouse
- Topic No.18: common faults with mouse and optical mouse
- Topic No.19: Introduction to scanner
- Topic No.20: digitizer

**Unit No.5 CRT Display Devices**

- Topic No.21: Block Diagram
- Topic No.22: Principle of operation of Computer Monitor
- Topic No.23: Difference between TV and Computer Monitor
- Topic No.24: Video display Adaptors (monochrome and Colour)
- Topic No.25: introduction to solid state displays
- Topic No.26: Printing Mechanism
- Topic No.27: Construction and working principles of Dot Matrix Printer
- Topic No.28: Inkjet Printer, Laser Printer, Printer Controller
- Topic No.29: Centronics Interface
- Topic No.30: Signals from PC to Printer and Printer to PC

**Unit No.7 Networking Devices**

- Topic No.31: Introduction to networking devices
- Topic No.32: LAN, WAN, Wi-Fi, WLAN
- Topic No.33: ROUTER, SWITCH, HUB

**Unit No.8 Modems**

- Topic No.34: Need and functions of modems
- Topic No.35: Laptop: Their need, function and applications

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment			External Assessment (Examination)			
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
4	-	-	25	-	100	3	-	-	125



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## RECOMMENDED BOOKS

- (1) PC Organisation by S. Chowdhury, Dhanpat Rai & Sons, Delhi
- (2) IBM PC Colons by Govinda Rajalu, Tata McGraw Hill Education Pvt Ltd, New Delhi
- (3) Text Book by Mark Minasi
- (4) Computers by P.Norton
- (5) Troubleshooting and maintenance of Computers by prof. S.P.S. Saini Vayu Education of India, New Delhi

## INSTRUCTION STRATEGY

This subject gives complete knowledge regarding the Computer Hardware. Teacher must give hands on practice related to operation, maintenance, installation etc. Teacher should encourage the students to do assembly of PC.

## SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING PAPER SETTER

Sr.No.	Unit Name	Time Allotted (Hrs)	Marks Allotted (%)
1	Mother Board	08	10
2	Buses and Ports	08	15
3	Memory	10	15
4	Keyboard and Mouse	08	15
5	CRT Display Devices	08	12
6	Printers	08	15
7	Networking Device	08	10
8	Modems	06	08
	<b>Total</b>	<b>64</b>	<b>100</b>





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**Subject: Maintenance of Computer System (Practical)**

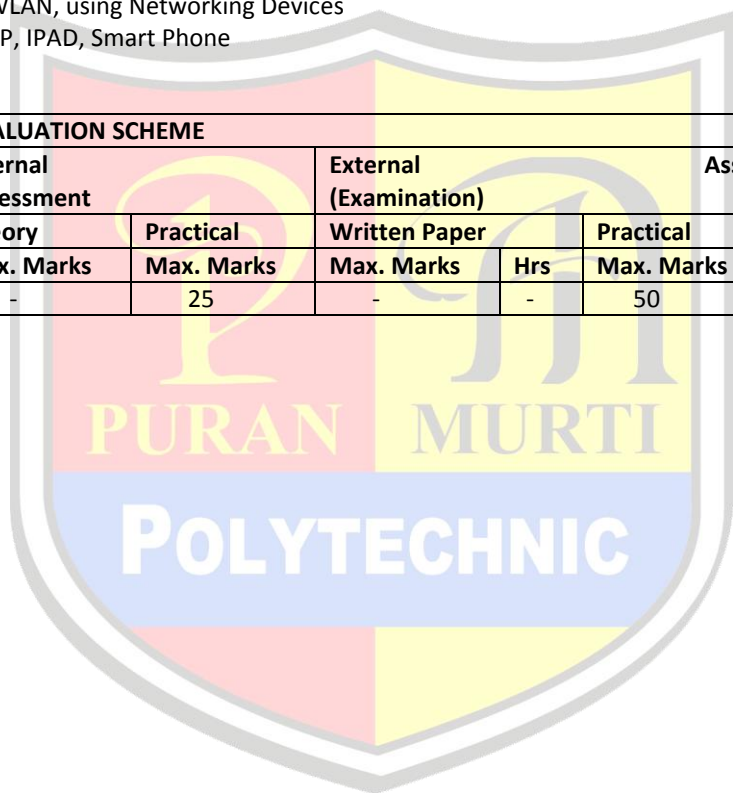
**Subject Code: 121062**

## LIST OF PRACTICALS

Operation, Maintenance, Installation and Testing of the following devices:

- (1) Monitors (LCD and LED)
- (2) HDD, Partitioning and Formatting
- (3) DOT Matrix Printer
- (4) Laser Printer
- (5) Mother board based on latest microprocessor and chipset CMOS Set up.
- (6) DVD-ROM/DVD Writer
- (7) Connectors and Cables
- (8) MODEM/ROUTER/SWITCH
- (9) Installation of any operating system.
- (10) Establish LAN, WLAN, using Networking Devices
- (11) Study of LAPTOP, IPAD, Smart Phone

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	3	-	25	-	-	50	3	75





## Detailed Contents

### **Unit No. 1 Wireless Communication**

- Topic No. 1: Basics
- Topic No. 2: Advantages of wireless communication
- Topic No. 3: Electromagnetic waves
- Topic No. 4: Frequency spectrum used
- Topic No. 5: Paging system
- Topic No. 6: Cordless telephone system
- Topic No. 7: Cellular telephone system
- Topic No. 8: Comparison of above wireless communication system

### **Unit No. 2 Cellular Telephone System**

- Topic No. 9: Introduction to first generation cellular telephone system
- Topic No. 10: Introduction to second generation cellular telephone system
- Topic No. 11: Introduction to third generation cellular telephone system
- Topic No. 12: Introduction to fourth generation cellular telephone system

### **Unit No. 3 Cellular concept**

- Topic No. 13: Cell area
- Topic No. 14: Capacity of a cell
- Topic No. 15: Frequency Reuse
- Topic No. 16: Co-Channel interference
- Topic No. 17: Adjacent channel interference
- Topic No. 18: Power control for reducing interference
- Topic No. 19: Improving coverage and capacity in cellular (cell splitting, sectoring, repeater for range extension)

### **Unit No. 4 Multiple access techniques for wireless communication**

- Topic No. 20: Introduction to Multiple Accesses
- Topic No. 21: Frequency Division Multiple Access (FDMA)
- Topic No. 22: Time Division Multiple Access (TDMA)
- Topic No. 23: Code Division Multiple Access (CDMA)
- Topic No. 24: Spread Spectrum Multiple Access (SSMA)
- Topic No. 25: Frequency Hopping spread Spectrum (FHSS)
- Topic No. 26: Comparison of FDMA/TDMA/CDMA

### **Unit No. 5 Mobile Communication Systems**

- Topic No. 27: Introduction of Global Systems for Mobile Communication (GSM) and its architecture
- Topic No. 28: Introduction of CDMA System
- Topic No. 29: Introduction of GPRS and GPS System
- Topic No. 30: Introduction to Blue tooth, Wi-Fi

### **Unit No. 6 Digital and Data Communication**

- Topic No. 31: Basic block diagram of digital and data communication system
- Topic No. 32: Their comparison with data analog communication systems

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
4	-	-	25	-	100	3	-	-	125



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## RECOMMENDED BOOKS

- (1) Wireless Communications, Principles and Practice, by Theodore S.Rappaport.
- (2) Wireless Communications by Singal, Tata McGraw Hill Education Pvt Ltd , New Delhi
- (3) Wireless Communications by Misra, Tata McGraw Hill Education Pvt Ltd , New Delhi
- (4) Introduction to Wireless and Mobile Systems, by Dharma Prakash Agarwal, Qing-An zeng.
- (5) Wireless Communications and Networking, by William Stallings.
- (6) Mobile and Personal Communication Systems and Services, by Raj Pandya, Prentice Hall of India, New Delhi
- (7) Mobile Communication by John Schiller, Prentice Hall of India, New Delhi
- (8) Wireless Communications by Pahalwan, Pearson Publishers
- (9) Wireless and Mobile Communication VK Sangar, Ishan Publications.

## INSTRUCTION STRATEGY

Wireless and Mobile Communication is having significant impact in Electronics Market. For the proper awareness of this subject it is must to provide the students the detail functioning of wireless/mobile system/equipment. For this visits must be arranged to BTS/MSC (Mobile Switching Centre) providers. The theory classes need to be application based in addition to industrial visits in the BSNL, Vodafone, Airtel, SPICE, TATA indicom etc

## SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING PAPER SETTER

Sr.No.	Unit Name	Time Allotted (Hrs)	Marks Allotted (%)
1	Wireless Communication	12	20
2	Cellular Telephone System	04	05
3	Cellular Concept	12	20
4	Multiple Access Techniques for Wireless Communication	16	25
5	Mobile Communication Systems	16	25
6	Digital and Data Communication	04	05
	<b>Total</b>	<b>64</b>	<b>100</b>



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**Subject: Wireless and Mobile Communication (Practical)**

**Subject Code: 121063**

### LIST OF PRACTICALS

- (1) Study the features, specification and working of cellular mobile
- (2) Signal strength measurement of various points from a transmitting antenna/cordless phone
- (3) Visit of a Mobile Switching Centre (MSC) in the nearest M.S. facility provider
- (4) Demonstration of Base Trans Receiver (BTS) with nearby cellular tower
- (5) Observing call processing of GSM trainer Kit
- (6) Observing call processing of CDMA trainer Kit
- (7) Pairing of two devices using Bluetooth
- (8) Data transfer using WI-FI

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	3	-	25	-	-	50	3	75





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**Subject: Entrepreneurship Development and Management (Theory)**  
**Detailed Contents**

**Subject Code: 120264**

**Section A: - ENTREPRENEURSHIP**

**Unit No.1 Introduction**

- Topic No.1: Concept /Meaning and its need
- Topic No.2: Qualities and functions of entrepreneur and barriers in entrepreneurship.
- Topic No.3: Sole proprietorship and partnership forms of business organizations
- Topic No.4: Schemes of assistance by entrepreneurial support agencies at National, State, District level: NSIC, NRDC,
- Topic No.5: SIDBI, NABARD, Commercial Banks, SFC's

**Unit No.2 Market Survey and Opportunity Identification**

- Topic No. 6: Scanning of business environment
- Topic No. 7: Salient features of National and State industrial policies and resultant business opportunities
- Topic No. 8: Types and conduct of market survey
- Topic No. 9: Assessment of demand and supply in potential areas of growth
- Topic No. 10: Identifying business opportunity
- Topic No. 11: Considerations in product selection

**Unit No.3 Project report Preparation**

- Topic No. 12: Preliminary project report
- Topic No.13: Detailed project report including technical, economic and market feasibility
- Topic No.14: Common errors in project report preparations
- Topic No.15: Exercises on preparation of project report

**Unit No.4 Introduction to Management**

- Topic No.16: Definitions and importance of management
- Topic No.17: Functions of management: Importance and organizing, staffing, directing and controlling
- Topic No.18: Principles of management (Henri Fayol, F.W).
- Topic No.19: Concept and structure of an organization
- Topic No.20: Types of industrial organizations
  - a) Line organization
  - b) Line and staff organization
  - c) Functional Organization

**Unit No.5 Leadership and Motivation**

- Topic No. 21: Definition and Need of leadership Definition and Need
  - a) Qualities and functions of a leader
  - b) Manager Vs leader
  - c) Types of leadership
- Topic No. 22: Qualities and functions of a leader
- Topic No. 23: Manager Vs leader
- Topic No.24: Types of leadership
- Topic No.25: Definitions and characteristics of motivation
- Topic No.26: Factors affecting motivation
- Topic No.27: Theories of motivation (Maslow, Herzberg)

**Unit No.6 Management Scope in Different Areas**

- Topic No.28: Human Resource Management
  - a) Introduction and objective
  - b) Introduction to Man power planning, recruitment and selection
  - c) Introduction to performance appraisal methods
- Topic No.29: Material and Store Management
  - a) Introduction functions, and objectives
  - b) ABC Analysis and EOQ
- Topic No.30: Marketing and sales
  - a) Introduction, importance, and its functions





- b) Physical distribution
- c) Introduction to promotion mix
- d) Sales promotion

Topic No.31: Financial Management

- a) Introductions, importance and its functions
- b) Elementary knowledge of income tax, sales tax, excise duty, custom duty and VAT

### Unit No.7 Miscellaneous Topics

Topic No.32: Customer Relation Management (CRM)

- a) Definition and need
- b) Types of CRM

Topic No.33: Total Quality Management (TQM)

- a) Statistical process control
- b) Total employees Involvement
- c) Just in time (JIT)

Topic No.34: Intellectual Property Right (IPR)

- a) Introductions, definition and its importance, Infringement related to patents, copy right, trade mark

STUDY SCHEME		EVALUATION SCHEME							Total Marks
		Internal Assessment			External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
3	-	-	50	-	100	3	-	-	150

### RECOMMENDED BOOKS

- (1) A Handbook of Entrepreneurship, Edited by BS Rathore and Dr JS Saini; Aapga Publications, Panchkula (Haryana)
- (2) Entrepreneurship Development published by Tata McGraw Hill Publishing Company Ltd., New Delhi
- (3) Entrepreneurship Development in India by CB Gupta and P Srinivasan; Sultan Chand and Sons, New Delhi
- (4) Entrepreneurship Development - Small Business Enterprises by Poornima M Charantimath; Pearson Education, New Delhi
- (5) Entrepreneurship: New Venture Creation by David H Holt; Prentice Hall of India Pvt. Ltd., New Delhi
- (6) EDM by Bajaj and Chawla, Ishan publication
- (7) Principles and Practice of Management by L M Prasad; Sultan Chand & Sons, New Delhi.

### INSTRUCTION STRATEGY

Some of the topics may be taught using question/answer, assignment or seminar method. The teacher will discuss stories and case studies with students, which in turn will develop appropriate managerial and entrepreneurial qualities in the students. In addition, expert lecturers may also be arranged from outside experts and students may be taken to nearby industrial organizations on visit. Approach extracted reading and handouts may be provided.

### SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING PAPER SETTER

Sr.No.	Unit No.	Time Allotted (Hrs)	Marks Allotted (%)
1	1	14	28
2	2	10	20
3	3	08	16
4	4	04	10
5	5	03	06
6	6	06	14
7	7	03	06
<b>Total</b>		<b>48</b>	<b>100</b>





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**Subject: Major Project Work (Practical)**

**Subject Code: MPW (P)**

### Detailed Contents

Major Project Work aims at developing innovative skills in the students whereby they apply in totality the knowledge and skills gained through the course work in the solution of particular problem or by undertaking a project. In addition, the project work is intended to place students for project oriented practical training in actual work situation for the stipulated period with a view to:

Develop understanding regarding the size and scale of operations and nature of field-work in which students are going to play their role after completing the courses of study.

Develop understanding of subject based knowledge given in the classroom in the context of its application at work places.

Develop first hand experience and confidence amongst the students to enable them to use and apply polytechnic/institute based knowledge and skills to solve practical problems related to the world of work.

Develop abilities like interpersonal skills, communication skills, positive attitudes and values etc.

The individual students have different aptitudes and strengths. Project work, therefore, should match the strengths of students. For this purpose, students should be asked to identify the type of project work, they would like to execute. The activity of problem identification should begin well in advance (say at the end of second year). Students should be allotted a problem of interest to him/her as a major project work. It is also essential that the faculty of the respective department may have a brainstorming session to identify suitable project assignments for their students. The project assignment can be individual assignment or a group assignment. There should not be more than 3 students if the project work is given to a group. The project work identified in collaboration with industry should be preferred.

This practical training cum project work should not be considered as merely conventional industrial training in which students are sent at work places with either minimal or no supervision. This experience is required to be planned in advance and supervised on regular basis by the polytechnic faculty. For the fulfillment of above objectives, polytechnics may establish close linkage with 8-10 relevant organization for providing such an experience to students. It is necessary that each organization is visited well in advance and activities to be performed by students are well defined. The chosen activities should be such that it matches with the curricular interest to students and of professional value to industrial/ field organizations. Each teacher is expected to supervise and guide 5-6 students.

#### **Some of the project activities are given below:**

- Projects related to designing small electronic equipment / instruments
- Projects related to increasing productivity in electronic manufacturing areas
- Projects related to quality assurance
- Projects connected with repair and maintenance of plant and equipment
- Projects related to design of PCBs
- Projects related to suggesting substitutes of electronics components being used
- Projects related to design of small oscillators and amplifier circuits
- Projects related to design, fabrication, testing and application of simple digital circuits and components
- Projects related to microprocessor based circuits/ instruments.

#### **Some of the projects based on above areas are listed below for the benefit of students:**

- Microprocessor based rolling display/bell and calendar
- Microprocessor based stepper motor control
- Speed control of DC Machines by Microprocessors
- Temperature monitoring using microprocessor based systems
- Microprocessor based liquid level indicator and control/solar tracking system
- Fabrication and assembling of digital clock
- Design and fabrication of timing circuits using 555 and counters
- Design and fabrication of amplifiers and oscillators circuits
- Fabrication of demonstration type Radio receiver
- Fabrication of PCB circuits using ORCAD/ Fagu Software
- Fabrication of ON line/OFF line UPS of different ratings and inverters



- Design, fabrication and testing of different types of experimental boards as per the curriculum of Electronics and Communication Engineering
- Repair of X-Ray Machines, ECG, EEG, EMG, Calorimeter and Centrifuge etc
- Repair and fault location of telephone exchanges and intercom system
- Repair of oscilloscope, function generator, Power supply
- Design and developing web sites of organizations
- Installation of computer network (LANs)
- Microprocessor based solar tracking system
- Car or home security system
- Bank token display
- Printer sharing unit
- Caller Identification unit for phone
- LCR-Q meter and frequency meter
- $\mu$ P-Based A/D converter
- $\mu$ P-Based D/A converter
- Simulation of half wave and full wave rectifiers using ORCAD
- Simulation of following circuits
- Integrator, differentiator, adder, subtractor, V-I converter comparator etc. using OP-AMPS
- Simulation of class A, Class B, Class AB and Class C amplifiers
- Simulation of different wave forms like sine, square, triangular waves etc.

The overall grading of the practical training shall be made as per following table. In order to qualify for the diploma, students must get "Overall Good grade" failing which the students may be given one more chance to improve and re-evaluated before being disqualified and declared "not eligible to receive diploma". It is also important to note that the students must get more than six "goods" or above "good" grade in different performance criteria items in order to get "Overall Good" grade.

Sr.No.	Range of maximum marks	Overall grade
i)	More than 80	Excellent
ii)	65-80	Very good
iii)	50-64	Good
iv)	41-49	Fair
v)	Less than 40	Poor

### Important Notes

1. This criteria must be followed by the internal and external examiner and they should see the daily, weekly and monthly reports while awarding marks as per the above criteria.
2. The criteria for evaluation of the students have been worked out for 100 maximum marks. The internal and external examiners will evaluate students separately and give marks as per the study and evaluation scheme of examination.
3. The external examiner, preferably, a person from industry/organization, who has been associated with the project-oriented professional training of the students, should evaluate the students performance as per the above criteria.
4. It is also proposed that two students or two projects which are rated best be given merit certificate at the time of annual day of the institute. It would be better if specific nearby industries are approached for instituting such awards.

The teachers are free to evolve another criteria of assessment, depending upon the type of project work. It is proposed that the institute may organize an annual exhibition of the project work done by the students and invite leading Industrial organizations in such an exhibition. It is also proposed that two students or two projects which are rated best be given merit certificate at the time of annual day of the institute. It would be better if specific industries are approached for instituting such awards.



# PM

## POLYTECHNIC

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**Suggestive criteria for assessing student performance by the external (person from industry) and internal (teacher) examiner are given in table below:**

Sr.No.	Performance criteria	Max. Marks	Rating Scale				
			Excellent	Very Good	Good Satisfactory	Poor	
1.	Selection of project assignment	10	10	8	6	4	2
2.	Planning and execution of considerations	10	10	8	6	4	2
3.	Quality of performance	20	20	16	12	8	4
4.	Providing solution of the problems or production of final product	20	20	16	12	8	4
5.	Sense of responsibility	10	10	8	6	4	2
6.	Self expression/ communication skills	5	5	4	3	2	1
7.	Interpersonal skills/human Relations	5	5	4	3	2	1
8.	Report writing skills	10	10	8	6	4	2
9.	Viva voce	10	10	8	6	4	2
<b>Total marks</b>		<b>100</b>	<b>100</b>	<b>80</b>	<b>60</b>	<b>40</b>	<b>20</b>



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**Subject: Employability Skills-II**

**Subject Code: Emp.Skill-II (P)**

## Detailed Contents

### Unit No. 1 Oral Practice

Topic No.1: Preparing for meeting

Topic No.2: Group discussion

Topic No.3: Seminar presentation

Topic No.4: Making a presentation

- Elements of good presentation
- Structure and tools of presentation
- Paper reading
- Power point presentation

STUDY SCHEME		EVALUATION SCHEME							Total Marks
		Internal Assessment			External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	2	-	25	-	-	50	3	75

