

MINUTES OF 4th MEETING OF BOARD OF STUDIES (BOS)

DEPARTMENT OF
ELECTRONICS AND
COMMUNICATION
UNIVERSITY POLYTECHNIC



MAY 18, 2021

BOARD OF STUDIES

Department of Electronics and Communication University Polytechnic

Minutes of the 4th Meeting of Board of Studies held on May 18, 2021 at 11:00 am in Online mode

The following members were present:

1. Colonel S.k Jain, Director, Ingenium Tech
2. Dr Pramod Singh, Principal, Jhansi
3. Mr. Abhay Chaturvedi, EC
4. Prof. Diwakar Bhardwaj
5. Dr. Vikas Sharma
6. Ms. Rohini Sharma
7. Mr. Aditya Goswami
8. Mr. Shivam Upadhyay
9. Ms. Ankita Chauhan
10. Mr. Vineesh Singh

The Chairman Board of Studies welcomed all the members and started proceedings of the 4th meeting of BoS in accordance with the Agenda note circulated earlier. After this, the agenda was taken up for discussion.

Agenda Item – 4.01: To confirm the minutes of the 3rd BoS meeting

The minutes of the meeting of 3rd BoS held on April 7th, 2019 were confirmed and enclosed as Annexure A.

Agenda Item – 4.02: Action Taken Report (ATR)

The following ATR based on the minutes of the 3rd BoS were presented in Annexure B:

Agenda Item	Description	Action Taken
1	Confirmation of the minutes of the 3 rd BoS Meeting	Suggestions incorporated. See Annexure A
2	To consider the changes in the syllabi of following subjects. <ul style="list-style-type: none"> • DEC3003: Electronics Instrument and measurement. • DEC3001: Basic Electronics • DEC4002: Analog Communication • Introduced to Simulation Lab in semester IIIrd • DEC4001: Network Analysis and transmission line. • DEC4003: Electronic Devices and 	Approved by Academic Council and implemented. No Action pending.

	<p>Circuits.</p> <ul style="list-style-type: none"> • DEC4005: Microprocessor • Introduced MATLAB in semester IVth • Introduced Robotics and automation lab in semester Vth • DEC5001: Electromagnetic Theory and Antennas. • DEC5009: Control System. • DEC5089: Control System Lab • DEC6001: Microwave Engineering • DEC6002: Optical Fiber Communication • DEC6004: Mechatronics • Introduce Digital Design lab in semester VIth 	<p>Approved by Academic Council and implemented. No Action pending.</p>
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Agenda Item – 4.03: To consider and recommend changes in the syllabus of following subjects .

The experts and members of BoS thoroughly checked and appraised the changes in the following courses, enclosed as Annexure C.

Subjects	EXISTING CONTENT	MODIFIED CONTENT	Remarks
Basic Electronics (DEC-3201)	<i>Some topics have been added to strengthen the subject knowledge as per the experts without replacing the existing topics.</i>	<i>Introduction to power electronics devices: Power MOSFET, SCR, UJT, IGBT, DIAC, TRIAC with their characteristics.</i>	Recommended by BoS committee
Programming in C (DCS-3081)	<i>The project has been added with the existing topic for more practical exposure.</i>	<i>C language based projects</i>	Recommend by BoS committee
Principle of Communication (DEC-4202)	<i>The existing topics remain same but few topics have been added as per industrial requirement.</i>	<i>Line coding in third module.</i>	Recommend by BoS committee

Agenda Item – 4.04: To consider the introduction of following subjects in VIth semester.

The experts and members of BoS thoroughly checked and appraised the introduction of the following lab, enclosed at Annexure D.

- Recommended introduction of new **Lab Display Devices and Maintenance Lab-II (DEC 6086)** for the specialization due to the high demand of above mentioned lab in industrial and academics. Digital hardware design lab and above lab became electives.

Agenda Item – 4.05: Any other matter with permission of chair.

The following changes and modification in the syllabus with the permission of experts. There was no other matter and the meeting ended with thanks to the chair

Subjects	EXISTING CONTENT	MODIFIED CONTENT	Remarks
Electrical and Electronic Measurement (DEC-3203)	<i>Topics like AC fundamentals have been removed from Module 1 and few topics were added as per the discussion held with experts.</i>	<i>Resistance: Fixed and variable, temperature coefficient, Capacitor, Inductor, ohm's law, Concept of power. Introduction to DC machine- motor (series and shunt) and generator (series and shunt), AC machine- Single phase (induction machine and synchronous), Introduction to special machine (servo motor and stepper motor).</i>	Recommended by BoS committee
Network analysis and transmission line (DEC-4201)	<i>The existing content remains as it is but the name of the subject is changed as per the experts advice.</i>	<i>Subject name has changed to Network Analysis and Synthesis as per syllabus contents</i>	Recommend by BoS committee

The experts and members of BoS made their observations and recommend the updation of contents in the above courses as per the industrial needs and to strengthen the subject knowledge to the students.

Dr. Vikas Kumar Sharma
Principal (Admin)
University Polytechnic
GLA University, Mathura

Prof. Diwakar Bharadwaj
Principal (Academic)
University Polytechnic
GLA University, Mathura

ANNEXURE -A

Department of Electronics and Communication Engineering

Minutes of the 3rd Meeting of Board of Studies held on May 6th, 2019

Member's Present:

1. Prof. (Dr.) Atul Bansal, COE, GLA University, Mathura
2. Dr. Vishal Goyal, Associate Professor, Elect. & Comm. Engg(IET), GLA University, Mathura
3. Dr. Abhay Chaturvedi, Associate Professor, Elect. & Comm. Engg(IET), GLA University, Mathura
4. Mr. Aditya Goswami, Program Co-Ordinator, University Polytechnic, Dept. of Electronic Engg
5. Ms. Rohini Sharma, Lecturer, Dept. of Electronic Engg.
6. Mr. Shivam Upadhyay, Lecturer, Dept. of Electronic Engg.
7. Ms. Meenal Kate, Lecturer, Dept. of Electronic Engg.
8. Ms. Ankita Chauhan, Lecturer, Dept. of Electronic Engg.

The Chairman Board of Studies welcomed all the members and started proceedings of the 3rd meeting of BoS in accordance with the Agenda note circulated earlier.

Agenda Item – 03.1: To confirm the minutes of the 3rd BoS meeting.

The minutes of the meeting of 3rd BoS held on July 20th, 2018 were implemented and enclosed as Annexure - A.

Agenda Item – 03.2: Action Taken Report (ATR).

The ATR based on the minutes of the 3rd BoS were presented

Agenda Item – 03.3: DEC 3003: Change & Modification in Syllabus of Electronics Instrument and Measurement in IIIrd Sem.

- ❖ *The experts gave their opinion regarding the changes in the syllabus of **DEC 3003: Electronics Instrument and Measurement**. The subject was discussed among the panel and found that **Basic Electrical and Electronic instrument and measurement** should be merged. Added new content as per requirement and subject code is **changed as DEC 3103** and the **subject name is changed as Electrical and Electronics Measurement**. The proposed course structure with modified syllabi and subject name is enclosed as Annexure – B.*

Agenda Item – 03.4: DEC: 3086 New Lab of Simulation is introduced in IIIrd Sem .

- ❖ *The experts gave their opinion for the introduction of new **Lab Simulation** for the specialization due to the high demand of above mentioned lab in industrial and academics. The proposed course structure with syllabi and subject name is enclosed as Annexure – B.*

Agenda Item – 03.5: DEC 3001: Change and Modification in the syllabus of Basic

Electronics

- ❖ *The experts gave their opinion regarding the changes in the syllabus of **DEC 6002: Basic Electronics**. The subject was discussed among the panel and decided to remove some topic which are tough for diploma students. Added new content as per requirement and subject code is **changed as DEC 3101**. The proposed course structure with modified syllabi and subject name is enclosed as Annexure – E.*

Agenda Item –03.6: DEC 4002 & 5002: Change & Modification in Syllabus of Analog and Digital communication in IVth and Vth Sem.

- ❖ *The experts gave their opinion regarding the changes in the syllabus of **DEC 4002 & 5002: Analog and digital communication in IVth and Vth Sem**. The subject was discussed among the panel and decided to merge both of them and make a single subject with subject code **as DEC 4102** and the **subject name is changed as Principle of Communication** and lab with code **DEC-4182-Principle of communication lab**. The proposed course structure with modified syllabi and subject name is enclosed as Annexure – C.*

Agenda Item – 03.7: DEC 4001: Change & Modification in Syllabus of Network and Analysis and transmission line IVth Sem.

- ❖ *The experts gave their opinion regarding the changes in the syllabi of **DEC 4001: Change & Modification in Syllabus of Network and Analysis and transmission line IVth Sem**. The subject was discussed among the panel and it was decided that there is no need to teach transmission line with Network Analysis. Added new content as per requirement and subject name and code is **changed as DEC 4101: Network analysis and synthesis**. The proposed course structure with modified syllabi and subject name is enclosed as Annexure – C.*

Agenda Item – 03.8: DEC 4003: Change and Modification in the syllabus of Electronics devices and circuits

- ❖ *The experts gave their opinion regarding the changes in the syllabus of **DEC 4003: Electronics devices and circuits**. The subject was discussed among the panel and decided to remove some topic which are tough for diploma students. Added new content as per requirement and subject code is **changed as DEC 4103**. The proposed course structure with modified syllabi and subject name is enclosed as Annexure – E.*

Agenda Item – 03.9: DEC 4005: Change and Modification in the syllabus of Microprocessor IVth Sem.

- ❖ *The experts gave their opinion regarding the changes in the syllabi of **DEC 4005: Change and Modification in the syllabus of Microprocessor**. The subject was discussed among the panel and some necessary changes were made according to the need of industry and academics. Added new content as per requirement and subject code is **changed as DEC 4105**. The proposed course structure with modified syllabi and subject name is enclosed as Annexure –C.*

Agenda Item – 03.10: DEC 4087: New Lab MATLAB is introduced in IVth Sem .

- ❖ *The experts gave their opinion for the introduction of new **Lab MATLAB** for the specialization due to the high demand of above mentioned lab in industrial and academics. The proposed course structure with syllabi and subject name is enclosed as Annexure – C.*

Agenda Item – 03.11: DEC 5083: New Lab ROBOTICS AND AUTOMATION is introduced in Vth Sem.

- ❖ *The experts gave their opinion for the introduction of new **Lab ROBOTICS AND AUTOMATION** for the specialization due to the high demand of above mentioned lab in industrial and academics. The proposed course structure with syllabi and subject name is enclosed as Annexure – D.*

Agenda Item – 03.12: DEC: 5096 New Lab DISPLAY DEVICES REPAIRING AND

MAINTENANCE LAB is introduce in Vth Sem.

- ☐ *The experts gave their opinion for the introduction of new Lab DISPLAY DEVICES REPAIRING AND MAINTENANCE LAB for the specialization due to the high demand of above mentioned lab in industrial and academics. The proposed course structure with syllabus and subject name is enclosed as Annexure
– D.*

Dr. Vikas Kumar Sharma
Principal (Admin)
University Polytechnic
GLA University, Mathura

Prof. Diwakar Bharadwaj
Principal (Academic)
University Polytechnic
GLA University, Mathura

ANNEXURE -B

GLA UNIVERSITY POLYTECHNIC

COURSE STRUCTURE, CONTACT HOURS and CREDITS

**DISCIPLINE: ELECTRONICS & COMMUNICATION
ENGINEERING SEMESTER : III (FULL-TIME)**

Sr. No.	Subject Code	Subject Name	Periods Per Week			Cr
			L	T	P/D	
1	DCS 3001	Programming in 'C'	3	0	0	3
2	DEC 3101	Basic Electronics	3	0	0	3
3	DEC 3102	Digital Electronics	3	0	0	3
4	DEC 3103	Electrical and Electronics Measurement.	3	0	0	3
5	DCS 3081	Programming in 'C' Lab	0	0	4	2
6	DEC 3081	Basic Electronics Lab	0	0	4	2
7	DEC 3082	Digital Electronics Lab	0	0	4	2
7	DEC 3083	Electronics Instruments & Measurement Lab	0	0	4	2
8	DEC 3095	Soft Skills-I	0	0	2	1
9.	DEC 3086	Simulation lab	0	0	2	1
TOTAL			12	0	20	22

L- Lecture Period, T-Tutorial Period, P- Practical Period, D- Drawing Practice Period, Cr. - Credits,

DEC 3101 – BASIC ELECTRONICS

Credits: 3

Semester III

L-T-P: 3-0-0

Module No.	Contents	Teaching Hours
Unit –I	<p>Semiconductor Physics: Basic of Semiconductor materials and effect of temperature on semiconductor.</p> <p>PN Junction Diode: P-N junction diode with its Forward & Reverse Characteristics.</p> <p>Rectifiers & Filters: Rectifier circuit (HWR, FWR). Their comparison on the basis of circuit operation, ripple factor, ripples frequency, transformer utilization factor, and rectification efficiency.</p>	12
Unit – II	<p>Clipping & Clamping circuits: Types and applications. Voltage multiplier circuits: Types and application</p> <p>Special purpose diode: Light Emitting Diode, Liquid Crystal Display, Tunnel diode (with tunneling function), Zener diode and its numerical problems.</p>	12
Unit - III	<p>Bipolar Junction Transistor (BJT): Construction, working principle of PNP and NPN transistors, characteristics of CB, CE and CC configurations. D.C load line, Thermal stability factor.</p> <p>FET- Introduction to JFET, MOSFET- n channel and P channel</p>	12

RECOMMENDED BOOKS

1. Electronic Devices and Circuit Theory, 9th Edition by Robert Boylestad & Louis Nashelsky, Prentice Hall India Private Limited.

Reference Books:-

2. Electronic Principles, 7th Edition by Albert Paul Malvino, (Tata McGraw - Hill Publishing Company Ltd).
3. Electronic Devices and Circuits, 5th Edition by David Bell, Oxford University Press.
4. Basic Electronics and Linear Circuits, 4th Edition by Bhargava, Kulshrestha and Gupta (Tata McGraw - Hill Publishing Company Limited).

DEC-3102: DIGITAL ELECTRONICS

Credits: 3

Semester III

L-T-P: 3-0-0

Module No.	Contents	Teaching Hours
Unit –I	<p>Introduction To Digital Techniques:</p> <p>Number System – Introduction to Binary, Octal, Decimal, Hexadecimal number system, Conversion of number systems, 1's complement and 2's complement, Binary arithmetic (addition, subtraction). BCD code, BCD arithmetic (addition, subtraction). Logic Gates And Boolean Algebra:- Logical symbol, logical expression and truth table of AND, OR, NOT, NAND, NOR, EX-OR and EX-NOR gates. Universal gates – NAND and NOR gates. Basic laws of Boolean algebra, Duality theorem. De Morgan's theorems.</p>	12
Unit – II	<p>Combinational Logic Design/Circuits:- Simplification of Boolean expression using Boolean algebra, Construction of logical circuits from Boolean expressions, K-map representation of logical functions, Minimization of logical expressions using K-map (2, 3, 4 variables). Standardization of SOP & POS equations, Concept of Adders / Sub tractors, Truth table, K-map, Simplified logical expression and logical circuit using basic gates and universal gates of: (a) Half adder and full adder (b) Half sub tractor and full sub tractor. Block diagram, Truth table, Logical expression and logic diagram of Multiplexers (4:1 and 8:1),</p>	12
Unit – III	<p>Flip Flops And Sequential Logic Design:- Symbol and Logic diagram using NAND gates, working principle, timing diagram of Clocked S R, J K, D & T flip flop. Registers- SISO, SIPO, PIPO, PISO. Counters- Asynchronous and synchronous Memories: - Classification of memories, RAM, ROM, PROM, EPROM, EEPROM.</p>	12

Text Books:-

1. Malvino & Leach "Digital Principles and Applications", Tata McGraw Hill, Delhi.
2. Gayakwad R.A. "Op-Amps and Linear Integrated Circuits", Prentice Hall of India, Delhi.

Reference Books:-

3. Taub & Schilling "Digital Electronics", Tata McGraw Hill, Delhi.
4. Nagrath IJ. "Electronics Analog and Digital", Prentice Hall of India Ltd Delhi.
5. Jain R.P. "Modern Digital Electronics", Tata Mc-Graw Hill Delhi.

DEC 3103 Electrical and Electronic Measurement.

Credits: 3

Semester III

L-T-P: 3-0-0

Module No.	Contents	Teaching Hours
Unit –I	A.C. FUNDAMENTALS Single-phase A.C. Circuits: Concept of complex impedance – Rectangular & polar form. R-L-C Series Circuit: Representation of impedance, voltage, current and power in complex form phasor diagram Impedance triangle – problems. Parallel Circuit: Phasor diagram, problems (maximum 3 branches).	12
Unit – II	TRANSFORMERS: Principle of operation. E.M.F equation, Voltage & Current relations., Transformer Definition regulation and efficiency; Elementary idea of losses in Transformer, open circuit and short circuit test. MEASUREMENT FUNDAMENTALS: Explanation of accuracy, precision, sensitivity, resolution, dynamic range, response and repeatability of measuring instruments. CRO construction and principle Measurement of Voltage, current and phase by CRO, Digital multimeter and signal generator.	12
Unit - III	TRANSDUCERS FUNDAMENTALS: Principle of operation of transducer and sensor – Their applications – Factors affecting the choice of transducer. Resistive transducers –strain gauge and derivation of gauge factor, inductive transducers-LVDT, RVDT, capacitive transducers, temperature transducers-, optical transducers,	12

Text Books:-

1. Fundamentals of Industrial Instrumentation A Fundamentals of Electric Circuit Alexander Mc Graw Hill
2. Electric Circuit David A. Bell Oxford
3. Circuits & Network Sukhua, Nagsarkar Oxford
4. A Text Book of Electrical Technology Part-I B.L. Thereja S. Chand & Co

References

1. Barua Wiley India Pvt Ltd
2. Instrumentation Devices & System Rangan, Sarma, Mani Mc Graw Hill

DEC 3086: SIMULATION LAB

Credits: 1

Semester: III

L-T-P: 0-0-2

Contents	Teaching Hours
<ul style="list-style-type: none">• Verification of Half-Wave and Full-Wave Rectifier• Frequency Response of CE Amplifier• Frequency Response of CS Amplifier• Frequency Response of CC Amplifier• Design of Wein-Bridge Oscillator• Verification of Clippers & Clampers• Design and Verification of RC coupled amplifier• Design and Verification of Voltage Regulator• Design and Verification of Attenuators• Design and Verification of Differential amplifier	24

GLA UNIVERSITY POLYTECHNIC

COURSE STRUCTURE, CONTACT HOURS and CREDITS

DISCIPLINE : ELECTRONICS & COMMUNICATION
ENGINEERING SEMESTER : IV (FULL-TIME)

Sr. No.	Subject Code	Subject Name	Periods Per Week			Cr
			L	T	P/D	
1	DEC-4101	Network Analysis & Transmission Lines	3	0	0	3
2	DEC-4102	Principal of Communication	3	0	0	3
3	DEC-4103	Electronic Devices & Circuits	3	0	0	3
4	DEC-4105	Microprocessor	3	0	0	3
5	DEC-4081	PCB-Design-Lab	0	0	4	2
6	DEC-4182	Principal of Communication Engineering Lab	0	0	4	2
7	DEC-4083	EDC Lab	0	0	4	2
8	DEC-4084	Microprocessor lab	0	0	4	2
9	DEC-4095	Soft Skills-II	0	0	2	1
10	DEC-4087	Matlab lab	0	0	2	1
TOTAL			12	0	20	22

L- Lecture Period, T-Tutorial Period, P- Practical Period, D- Drawing Practice Period, Cr. - Credits,

DEC-4102: PRINCIPLES OF COMMUNICATION

Credits: 3

Semester IV

L-T-P: 3-0-0

Module No.	Contents	Teaching Hours
Unit –I	<p>INTRODUCTION: Block diagram of communication system</p> <p>AMPLITUDE MODULATION Introduction, Amplitude Modulation: Time and frequency- domain description, switching modulator, Envelope Detector.</p> <p>DSBSC: Time and frequency- Domain description, Ring modulator, coherent detection, SSB and VSB Method of Modulation; SSB Modulation, VSB modulation.</p>	12
Unit – II	<p>Angle Modulation: Basic definitions,</p> <p>Frequency Modulation: Narrow Band FM, Wide Band FM, Transmission bandwidth of FM Signals, Generation of FM Signals, Demodulation of FM Signals,</p> <p>FM Stereo Multiplexing, Introduction to Phase–Locked loop. Super heterodyne Receiver</p>	12
Unit - III	<p>DIGITAL REPRESENTATION OF ANALOG SIGNALS:</p> <p>Introduction, Why Digitize Analog Sources?, The Sampling Process, frequency Division multiplexing. Pulse Amplitude Modulation, Time Division Multiplexing, Pulse-Position Modulation, Introduction to digital modulation schemes</p>	12

References:

- a. Principles of Communication Systems, Taub & Schilling, TMH.
- b. Modern Digital and Analog Communication Systems, B. P. Lathi, OUP
- c. Communication System, Hykin, Wheeler
- d. Electronic Communication System, Kenndy, TMH
- e. Electronic Principles, 7th Edition by Albert Paul Malvino, (Tata McGraw - Hill Publishing Company Lt

DEC-4105: MICROPROCESSOR

Credits: 3

Semester IV

L-T-P: 3-0-0

Module No.	Contents	Teaching Hours
Unit –I	<p>INTRODUCTION TO MICROPROCESSOR: Generation and evolution of microprocessors. Basic Architecture of 8-Bit Microprocessor. Tristate register and switch.</p> <p>ARCHITECTURE OF INTEL-8085: registers, timing and control, add buffer and data buffer, interrupts control, serial input and output control, Pin out configuration Demultiplexing and buffering the system bus.</p> <p>TIMING CYCLE OF 8085: Machine cycle, instruction cycle, Instruction fetch cycle, read cycle and write cycle, Bus idle cycle, Hold and Halt state.</p>	12
Unit – II	<p>PROGRAMMING OF 8085: Software model of 8085A, Addressing modes of 8085A. Classification of instruction and Instruction set of 8085A, Concept of assembly language programming- basic assembler directives and labels.</p> <p>MEMORY INTERFACING : Generalized internal structure of memory device. Basic bus interface. Address space provided by 8085A, Address decoding. Interfacing ROM, static RAM and dynamic RAM</p>	12
Unit - III	<p>I / O INTERFACING AND DATA TRANSFER: Interfacing I/O devices, Address decoding, Isolated I/O versus memory mapped I/O. Synchronous and asynchronous data transfer. Interrupt driven data transfer, single interrupt, multiple interrupt-polling, priority interrupt controller, daisy chaining. Interrupts in 8085A – Software and hard ware – Vectored. Enabling, disabling and masking of interrupts. Direct memory access.</p> <p>I / O INTERFACING DEVICES: Functional block diagram and programming of : — a) 8253(programmable counter), b) 8255(PPI), Functional block description and control word development of :— a) 8259 (programmable interrupt controller), b) Introduction of 8086, difference between 8086 and 8085.</p>	12

References:

- 1) Microprocessors Architectures and Applications / Gaonkar / New Age International
- 2) Introduction to microprocessors / A. P. Mathur / Tata McGraw-Hill
- 3) Microprocessors: Principles and Applications / A. K. Pal / Tata McGraw-Hill
- 4) Microprocessors Principle and Applications / C. M. Gilmore / Tata McGraw-Hill
- 5) Microprocessors and its applications / Leventhal

DEC-4101: NETWORK ANALYSIS AND SYNTHESIS

Credits: 2

Semester IV

L-T-P: 3-0-0

Module No.	Contents	Teaching Hours
Unit –I	Active and passive, Linear and non-linear, Unilateral and bilateral, Lumped and distributed circuit, Time varying and time invariant parameter, Voltage and current sources (ideal and practical), Dependent and Independent sources, Source Transformation, KVL & KCL (Based Numerical), Mesh analysis and Nodal analysis, Conversion of star to delta & delta to star.	12
Unit – II	Network theorems: Superposition Theorem, Thevenin's Theorem, Norton's Theorem, and their application to 2 terminal D.C Networks. Maximum power transfer theorem for D.C. Circuit.(based Numerical) Two port network: Various two port circuit parameter: Evaluation of Z, Y, h and transmission (ABCD) parameters,	12
Unit - III	Transient Analysis: RL, RC and RLC circuits –classical approach. Network Functions: Concept of Complex frequency, Transform Impedances, Network functions of one port and two port networks, properties of driving point immittance and transfer function	12

Text Books:-

1. J. P. Ryder-Network Filters & Transmission Line- PHI
2. A. Chakravorty- An Introduction to Network, Filters & Transmission Line- Dhanpat rai & Co.
3. D. R. Chaudhry- Network Analysis-Dhanpat Rai & Co.
4. V. K. Aatre- Network Theory & Filter Design- New Age

International Pub. References:

- 1) Network, Filters and Transmission Lines / Jain & Kaur / Tata McGraw-Hill
- 2)) Circuit and networks / Sudhakar / Tata McGraw-Hill
- 3) 3) Introduction to network, Filters and Transmission Lines / A. K. Chakraborty / Dhanpat Rai & Sons
- 4) 4) Network Analysis / V. Valkenburg / Prentice Hall of India, N. Delhi
- 5) 5) Engineering Circuit Analysis / Hayt / Tata McGraw-Hill
- 6) 6) Electric Circuits / Edminister / Tata McGraw-Hill
- 7) Network, Lines and Fields / Ryder / Prentice Hall of India, N.

DEC 4087: MATLAB

Credits: 1

Semester: IV

L-T-P: 0-0-2

Module	Contents	Teaching Hours
I	<ul style="list-style-type: none"> • Introduction to matlab software • Basic operation of matrices. • To Study of different window, sub-window and work in Environment of MATLAB. • Design the model to perform basic arithmetic operation addition, subtraction using To plot To plot the sine wave • Write a program to plot the the multiple sine waves in a single figure window • To study the simulink • To study basic circuits in simulink. • To study different tool box – Communication tool box, Control tool box 	24

GLA UNIVERSITY POLYTECHNIC

COURSE STRUCTURE, CONTACT HOURS and CREDITS

**DISCIPLINE : ELECTRONICS AND COMMUNICATION
ENGINEERING SEMESTER : V SEM (FULL-TIME)**

Sr. No.	Subject Code	Subject Name	Periods Per Week			Cr
			L	T	P/D	
1	DEC 5101	Electromagnetic Theory & Antennas	3	0	0	3
2	DEC 5003	Signal And System	3	0	0	3
3		Elective-I	3	0	0	3
4		Elective-II	3	0	0	3
5	DEC 5083	Robotics and Automation Lab	0	0	4	2
6		Elective-II Lab	0	0	4	2
7	DEC 5084	Seminar	0	0	2	1
8	DEC 5098	Project-I	0	0	4	2
9	DEC 5096	Display Devices Repairing and maintenance lab	0	0	4	2
10	DEC 5095	Soft Skill-III	0	0	2	1
TOTAL			12	0	20	22
L						

L- Lecture Period, T-Tutorial Period, P- Practical Period, D- Drawing Practice Period, Cr. - Credits

ELECTIVE-I:

1. DEC 5004- RADAR AND TV
2. DEC 5005- AUDIO AND VIDEO ENG.
3. DEC 5006- EMBEDDED SYSTEM

ELECTIVE-II:

1. DEC 5007- VLSI DESIGN
2. DEC 5008- POWER ELECTRONICS
3. DEC 5109- CONTROL SYSTEM

ELECTIVE- II LAB

1. DEC 5087- VLSI DESIGN LAB
2. DEC 5088- POWER ELECTRONICS LAB
3. DEC 5189- CONTROL SYSTEM LAB

DEC-5101: ELECTROMAGNETIC THEORY & ANTENNAS

Credits: 3

Semester V

L-T-P: 3-0-0

Module No.	Contents	Teaching Hours
Unit –I	<p>VECTOR ALGEBRA, COORDINATE SYSTEM & VECTOR CLACULAS: Scalar & vectors, Unit vectors, Vector addition & subtraction, Position vector, Components of Vector. different Coordinate system, Relation in rectangular, cylindrical, spherical coordinate systems. Line, Surface and volume integral, Concept and physical interpretation of gradient, Divergence and curl. Divergence and Stoke's Theorem.</p> <p>ELECTROSTATIC: Electric field intensity & flux density (D). Electric field due to various charge configurations. Gauss's law, divergence of electric flux. Energy density in electrostatic field, Continuity equation and relaxation time,</p>	12
Unit – II	<p>MAGNETOSTATIC: Biot-savart's law, Ampere's Circuit law, Magnetic flux density, , Maxwell's equations for static field, Inductance, Magnetic energy.</p> <p>TIME VARYING FIELDS & RADIATION: Faraday's law, Displacement current, Maxwell's equations in point and integral forms,. Wave propagation in lossy dielectrics, Plane wave in lossless dielectrics, Plane wave in free space, Plane wave in good conductors, Power and the Poynting vector</p>	12
Unit - III	<p>TRANSMISSION LINES: Types of transmission lines: Parallel wire and coaxial cable, Primary and secondary constants of transmission lines. Characteristic impedance – Reflection co-efficient – Standing wave ratio and their relationship.</p> <p>ANTEENAS: Introduction to anteenas.</p>	12

Text Books:-

M.N.O. Sadiku, "*Elements of Electromagnetics*", 4th Ed, Oxford University Press

Jordan E.C. and Balmain K.G., "*Electromagnetic wave and radiating Systems*", PHI Second edition.

References:

- 8) W.H. Hayt and J.A. Buck, "*Electromagnetic Field Theory*", 7th TMH.
- 9) Circuit and networks / Sudhakar / Tata McGraw-Hill
- 10) Kraus, F "*Electromagnetics*" Tata McGraw Hill fifth edition.
- 11) *Antenna for all Applications 3rd edition*" Krauss, Marhefka & Ahmed S khan, TMH publication
- 12) Balanis Constantine A, *Antenna theory, Analysis and design*, 3rd edition, A John Wiley & sons Inc. Publication.

DEC: 5083 ROBOTICS AND AUTOMATION LAB

Credits: 2

Semester V

L-T-P: 0-0-4

S.No.	Contents	Teaching Hours
<ol style="list-style-type: none"> 1. Study of arduino kit. 2. Write the program of blinkig the LED with 5s result come on 13s 3. Write the programm of blinking the LED with different timing 4. Write the program of controlling the stepper motor 5. Write the program of controlling the dc motor with 100 ohm resistance 6. Build the program of Home Automation by using blue thooth device 7. Build the ldder program of automatic door lock by using password 8. Build the line follower robot by using aurdino kit 9. Write the program of controlling relay sheild from bluetooth enable device 10. (aurdino APK) 11. To measure heart beat per minnut 12. Wrote the programming of objective of detective pin 13 will go (on board LED on) and object detected message will be delayed in serial monitor 13. Assignment on introduction to robot configuration demonstration of robot with 2 dof, 3 dof. 14. Two assignments on programming the robot for applications 15. Two programming exercises for robots 16. Two case studies of applications in industry 17. Exercise on robotic simulation software 	48	

DEC-5096: Display Devices Repairing and Maintenance Lab

Credits: 2

Semester V

L-T-P: 0-0-4

Module No.	Contents	Teaching Hours
1	Study of 7 Segment Display i. Internal connection ii. Study of 4026 IC iii. Programming of 7- segment using Aurdino. iv. Outcome of all the above experiments.	72
2	Study of 16 *2 LCD display i. Internal connection. ii. Programming of 16*2 LCD using Aurdino. iii. Outcome of all the above experiments	
3	Study LCD TV. i. Study and Repairing of Power Supply Section. ii. Basic of (Mother Board, Display panel, Input Audio and Video) iii. Detection of basic fault on Mother Board iv. Testing and Repairing Sound System. v. Repairing of audio and video section	
4	Basic study of DTH, DVD and Dish TV etc. i. Testing and Repairing of audio and video section.	
5	Color TV and How it works. i. Basic Information of Color TV and its internal part (Power supply, Vertical and horizontal deflection plates , Color section, Audio Video section, automatic brightness control section, Sound section, CRT section etc)	
6	Repairing of color TV sections i. Power supply ii .Extremely High Voltage (EHT) iii. Vertical and Horizontal deflection iv. Sound section v. Audio and Video vi. Automatic brightness level vii. color and CRT section	

DEC 5109 – CONTROL SYSTEM

Credits: 3

Semester V

L-T-P: 3-0-0

Module No.		Teaching Hours
Unit – I	<p>Control system Terminology and classification of control system, examples of control system, mathematical modeling of Mechanical and Electrical systems analogy, differential equations, Feedback characteristics of control systems Feedback and non-feedback systems block diagram representation and reduction, Signal flow graph techniques.</p>	12
Unit – II	<p>Time response analysis Standard test signals, time response of 1st order system, time response of 2nd order system, steady-state errors and error constants, Introduction to effects of additions of poles and zeros to open loop and closed loop system. Time domain stability analysis Concept of stability of linear systems, effects of location of poles on stability, necessary conditions for stability, Routh-Hurwitz stability criteria.</p>	12
Unit - III	<p>Frequency response analysis Correlation between time and frequency response, Polar plots, Bode Plots, and minimum-phase systems, Frequency domain stability analysis Nyquist stability criterion, Introduction to relative stability using Nyquist Criterion (phase margin, gain margin and stability), closed-loop frequency response.</p>	12

References:

1. Nagrath and Gopal: Control System Engineering, New Age International Publishers.
2. Kuo: Automatic Control Systems, PHI Learning.
3. Varmah: Control Systems, TMH.

DEC 5189: CONTROL SYSTEM LAB

Credits: 02

Semester V

L–T–P: 0–0–4

Module No.	Content	Teaching Hours
I	<ul style="list-style-type: none"> • Introduction to MATLAB (Control System Toolbox), Implement at least two experiments in MATLAB. • Determine transpose, inverse values of given matrix. • Plot the pole-zero configuration in s-plane for the given transfer function. • Determine the transfer function for given closed loop system in block diagram representation. • Plot unit step response of given transfer function and find peak overshoot, peak time. • Plot unit step response and to find rise time and delaytime. • Plot locus of given transfer function, locate closed loop poles for different values of k. • Plot bode plot of given transfer function. • Plot bode plot of given transfer function and find gain and phase margins • Plot Nyquist plot for given transfer function and to compare their relative stability • Plot the Nyquist plot for given transfer function and to discuss closed loop stability, gain and phase margin. 	48

GLA UNIVERSITY POLYTECHNIC

COURSE STRUCTURE, CONTACT HOURS and CREDITS

**DISCIPLINE: ELECTRONICS AND COMMUNICATION
ENGINEERING. SEMESTER : VI SEM (FULL-TIME)**

Sr. No.	Subject Code	Subject Name	Periods Per Week			Cr
			L	T	P/D	
1	DEC 6101	MICROWAVE ENGINEERING	3	0	0	3
2	DEC 6102	OPTICAL FIBER COMMUNICATION	3	0	0	3
3		ELECTIVE-I	3	0	0	3
4		ELECTIVE-II	3	0	0	3
5	DEC 6183	OPTICAL FIBER COMMUNICATION LAB	0	0	6	3
6	DEC 6181	MICROWAVE ENGINEERING LAB	0	0	6	3
7	DEC 6098	PROJECT-II	0	0	4	2
8	DEC 6085	DIGITAL SYSTEM DESIGN LAB	0	0	4	2
TOTAL			12	0	20	22

ELECTIVE- I:

1. DEC 6004: MECHATRONICS
2. DEC 6009: MODERN CONSUMER ELECTRONIC APPLIANCES

ELECTIVE- II:

1. DEC 6007: WIRELESS AND COGNITIVE SYSTEM
2. DEC 6008: SATELLITE COMMUNICATION
3. DEC 6005 : DATA COMMUNICATION NETWORK

DEC-6101: MICROWAVE ENGINEERING

Credits: 03

Semester VI

L-T-P: 3-0-0

Module No.	Contents	Teaching Hours
Unit –I	<p>Rectangular Wave Guide: Wave propagation inside rectangular wave guide, Dominant and degenerate modes, Phase & group velocities, Wave impedances, Power transmission, Power losses in waveguide.</p> <p>Cavity Resonators: Introduction, Rectangular cavity</p>	12
Unit – II	<p>Microwave Components: Scattering matrix, Microwave T-Junctions: E-plane, H-plane and Hybrid Teas, Directional couplers</p> <p>Solid State Microwave Devices: Transferred electron devices (Gunn diode), p-i-n diode, SBD, Tunnel diode.</p>	12
Unit - III	<p>Microwave Tubes: Limitation of conventional active devices at microwave frequency, Two cavity klystron, Reflex klystron.</p> <p>Microwave Measurements: General set up of a microwave test bench, Slotted line carriage, VSWR meter, Measurement of frequency and wavelength.</p>	12

References:

1. Samuel Y. Liao, “*Microwave Devices and Circuits*”, 3rd Ed, Pearson Education.
2. Das and S. K. Das, “*Microwave Engineering*”, 2nd Edition, TMH.
3. R.E Collin, “*Foundation for Microwave Engineering*”, 2nd Ed., John Wiley Indi

DEC 6102– Optical Fiber Communication

Credits: 03

Semester VI

L-T-P: 3-0-0

Module No.	Contents	Teaching Hours
Unit –I	FUNDAMENTAL OF OPTICS : 1. Nature of Light : 1.1 Electromagnetic nature of light. 1.2 Principle of reflection, refractions, polarization. 1.3 Basic principle of optical communicaiton. 2. Introduciton To Optical Fibre: 2.1 Classificaiton of fibre 2.2 Physical structure.2.3 Transmission loss in optical fiber	12
Unit – II	OPTICAL DEVICE: 1. Optical Sources: 1.1 Direct and indirect band gap semiconductors. 1.2 Internal and external quantum efficiency. 1.3 Principle, characteritics and construction of LED. 1.4 Semiconductor Lasers - Laser action, PN junction laser, Febry- Perot resonators.	12
Unit - III	1. Detectors: 1.1 Introduction 1.2 Photodiode- Material and types. 1.3 Avalanche Photo Diode (APD), PIN diode. 1.4 Temperature effect on avalanche gain, noise in APD. 1.5 Photo transistor, PIN-FET, Photo darlingtion. 1.6 Response time, BW, Noise equivalent power, responsivity. 1.7 Spectral response, dark current and quantum efficiency. .	12

RECOMMENDED BOOKS

1. Electronic Devices and Circuit Theory, 9th Edition by Robert Boylestad & LouisNashelsky, Prentice Hall India Private Limited.

Reference Books:-

2. Electronic Principles, 7th Edition by Albert Paul Malvino, (Tata McGraw - Hill Publishing Company Ltd).
3. Electronic Devices and Circuits, 5th Edition by David Bell, Oxford University Press.
4. Basic Electronics and Linear Circuits, 4th Edition by Bhargava, Kulshresthaand Gupta (Tata McGraw - Hill Publishing Company Limited)

DEC-6085: DIGITAL STSTEM DESIGN

Credits: 2

Semester VI

L-T-P: 0-0-4

Exp No.	Contents	Teaching Hours
1.	Overview of HDL lab	48
2	Design all gates using VHDL.	
3.	Write VHDL programs for the following circuits, check the wave forms and the hardware generated a. Half adder b. Full adder	
4.	Write VHDL programs for the following circuits, check the wave forms and the hardware generated a. Multiplexer b. Demultiplexer	
5.	Write a VHDL program for a BCD to GRAY code converter and check the wave forms and the hardware generated.	
6.	Write a VHDL program for a T FLIP-FLOP and check the wave forms and the hardware generated	

ANNEXURE -C

DEC 3101 – BASIC ELECTRONICS (OLD)

Credits: 3

Semester III

L-T-P: 3-0-0

Module No.	Contents	Teaching Hours
Unit –I	<p>Semiconductor Physics: Basic of Semiconductor materials and effect of temperature on semiconductor.</p> <p>PN Junction Diode: P-N junction diode with its Forward & Reverse Characteristics.</p> <p>Rectifiers & Filters: Rectifier circuit (HWR, FWR). Their comparison on the basis of circuit operation, ripple factor, ripples frequency, transformer utilization factor, and rectification efficiency.</p>	12
Unit – II	<p>Clipping & Clamping circuits: Types and applications. Voltage multiplier circuits: Types and application</p> <p>Special purpose diode: Light Emitting Diode, Liquid Crystal Display, Tunnel diode (with tunneling function), Zener diode and its numerical problems.</p>	12
Unit - III	<p>Bipolar Junction Transistor (BJT): Construction, working principle of PNP and NPN transistors, characteristics of CB, CE and CC configurations. D.C load line, Thermal stability factor.</p> <p>FET- Introduction to JFET, MOSFET- n channel and P channel</p>	12

RECOMMENDED BOOKS

1. Electronic Devices and Circuit Theory, 9th Edition by Robert Boylestad & Louis Nashelsky, Prentice Hall India Private Limited.

Reference Books:-

2. Electronic Principles, 7th Edition by Albert Paul Malvino, (Tata McGraw - Hill Publishing Company Ltd).
3. Electronic Devices and Circuits, 5th Edition by David Bell, Oxford University Press.
4. Basic Electronics and Linear Circuits, 4th Edition by Bhargava, Kulshrestha and Gupta (Tata McGraw - Hill Publishing Company Limited).

DEC 3201 – BASIC ELECTRONICS (NEW)

Credits: 3

Semester III

L-T-P: 3-0-0

Introduction:

This subject introduces basic semiconductors, diodes working the basic circuit operations of analog electronics.

Objective: The objective of this Course is to provide the students with an introductory and broad treatment of the field of Electronics Engineering.

Module No.	Contents	Teaching Hours
Unit – I	<p>Semiconductor Physics: Basic of Semiconductor materials and effect of temperature on semiconductor.</p> <p>PN Junction Diode: P-N junction diode with its Forward & Reverse Characteristics.</p> <p>Rectifiers & Filters: Rectifier circuit (HWR, FWR). Their comparison on the basis of circuit operation, ripple factor, ripples frequency, transformer utilization factor, and rectification efficiency.</p>	12
Unit – II	<p>Clipping & Clamping circuits: Types and applications. Voltage multiplier circuits: Types and application</p> <p>Special purpose diode: Light Emitting Diode, Liquid Crystal Display, Tunnel diode (with tunneling function), Zener diode and its numerical problems.</p> <p>Bipolar Junction Transistor (BJT): Construction, working principle of PNP and NPN transistors, characteristics of CB, CE and CC configurations. D.C load line, Thermal stability factor.</p>	12
Unit - III	<p>FET- Introduction to JFET, MOSFET- n channel and P channel</p> <p>Introduction to power electronics devices</p> <p>Power MOSFET, SCR, UJT, IGBT, DIAC, TRIC with their characteristics</p>	12

RECOMMENDED BOOKS

1. Electronic Devices and Circuit Theory, 9th Edition by Robert Boylestad & Louis Nashelsky, Prentice Hall India Private Limited.

Reference Books:-

2. Electronic Principles, 7th Edition by Albert Paul Malvino, (Tata McGraw - Hill Publishing Company Ltd).
3. Electronic Devices and Circuits, 5th Edition by David Bell, Oxford University Press.
4. Basic Electronics and Linear Circuits, 4th Edition by Bhargava, Kulshrestha and Gupta (Tata McGraw

DCS 3081: PROGRAMMING IN 'C' LAB (OLD)

Credits: 2

Semester-III

L–T–P: 0–0–4

LIST OF

Module No.	Contents	Teaching Hours
1.	Programming Exercise on Executing and Editing, defining Variable and assigning values to variables. Programming Exercise on formatting input/output using printf and scanf.	48
2.	Programming Exercise on arithmetic's and relational operators. Programming Exercise on arithmetic expression and their evaluation.	
3.	Programming Exercise using if, if-else statement. Programming Exercise using nested if statement.	
4.	Programming Exercise on switch statement Programming Exercise on for statement.	
5.	Programming Exercise on while and do-while statement. Programming Exercise on functions.	
6.	Programming Exercise on arrays (single dimension) Programming Exercise on structure. Programming Exercise on Pointers.	

DCS 3081: PROGRAMMING IN 'C' LAB (NEW)

Credits: 2

Semester-III

L–T–P: 0–0–4

LIST OF

Module No.	Contents	Teaching Hours
1.	Programming Exercise on Executing and Editing, defining Variable and assigning values to variables. Programming Exercise on formatting input/output using printf and scanf.	48
2.	Programming Exercise on arithmetic's and relational operators. Programming Exercise on arithmetic expression and their evaluation.	
3.	Programming Exercise using if, if-else statement. Programming Exercise using nested if statement.	
4.	Programming Exercise on switch statement Programming Exercise on for statement.	
5.	Programming Exercise on while and do-while statement. Programming Exercise on functions.	
6.	Programming Exercise on arrays (single dimension) Programming Exercise on structure.	
7.	Programming Exercise on Pointers. Note: Basic mini Project in 'C' in groups.	

DEC-4102: PRINCIPLES OF COMMUNICATION (OLD)

Credits: 3

Semester IV

L-T-P: 3-0-0

Module No.	Contents	Teaching Hours
Unit –I	<p>INTRODUCTION: Block diagram of communication system</p> <p>AMPLITUDE MODULATION Introduction, Amplitude Modulation: Time and frequency- domain description, switching modulator, Envelope Detector.</p> <p>DSBSC: Time and frequency- Domain description, Ring modulator, coherent detection, SSB and VSB Method of Modulation; SSB Modulation, VSB modulation.</p>	12
Unit – II	<p>Angle Modulation: Basic definitions,</p> <p>Frequency Modulation: Narrow Band FM, Wide Band FM, Transmission bandwidth of FM Signals, Generation of FM Signals, Demodulation of FM Signals,</p> <p>FM Stereo Multiplexing, Introduction to Phase–Locked loop. Super heterodyne Receiver</p>	12
Unit - III	<p>DIGITAL REPRESENTATION OF ANALOG SIGNALS:</p> <p>Introduction, Why Digitize Analog Sources?, The Sampling Process, frequency Division multiplexing. Pulse Amplitude Modulation, Time Division Multiplexing, Pulse-Position Modulation, Introduction to digital modulation schemes.</p>	12

- a. Principles of Communication Systems, Taub & Schilling, TMH.
- b. Modern Digital and Analog Communication Systems, B. P. Lathi, OUP
- c. Communication System, Hykin, Wheeler
- d. Electronic Communication System, Kenndy, TMH
- e. Electronic Principles, 7th Edition by Albert Paul Malvino, (Tata McGraw - Hill Publishing Company Ltd).

DEC-4202: PRINCIPLES OF COMMUNICATION (NEW)

Credits: 3

Semester IV

L-T-P: 3-0-0

INTRODUCTION:

To introduce the concepts of various analog modulations and their spectral characteristics

OBJECTIVES:

- To understand the properties of communication process.
- To know the effect of noise on communication systems.

Module No.	Contents	Teaching Hours
Unit –I	<p>INTRODUCTION: Block diagram of communication system</p> <p>AMPLITUDE MODULATION Introduction, Amplitude Modulation: Time and frequency- domain description, switching modulator, Envelope Detector.</p> <p>DSBSC: Time and frequency- Domain description, Ring modulator, coherent detection, SSB and VSB Method of Modulation; SSB Modulation, VSB modulation.</p>	12
Unit – II	<p>Angle Modulation: Basic definitions,</p> <p>Frequency Modulation: Narrow Band FM, Wide Band FM, Transmission bandwidth of FM Signals, Generation of FM Signals, Demodulation of FM Signals,</p> <p>FM Stereo Multiplexing, Introduction to Phase–Locked loop. Super heterodyne Receiver</p>	12
Unit - III	<p>DIGITAL REPRESENTATION OF ANALOG SIGNALS:</p> <p>Introduction, Why Digitize Analog Sources?, The Sampling Process, frequency Division multiplexing. Pulse Amplitude Modulation, Time Division Multiplexing, Pulse-Position Modulation, Introduction to digital modulation schemes, Line coding</p>	12

Reference Books

- a. Principles of Communication Systems, Taub & Schilling, TMH.
- b. Modern Digital and Analog Communication Systems, B. P. Lathi, OUP
- c. Communication System, Hykin, Wheeler
- d. Electronic Communication System, Kenndy, TMH
- e. Electronic Principles, 7th Edition by Albert Paul Malvino, (Tata McGraw - Hill Publishing Company Ltd).

ANNEXURE -D

DEC-6086: Display Devices Repairing and Maintenance-II

Credits: 2

Semester VI

L-T-P: 0-0-4

Module No.	Contents	Teaching Hours
I	<ul style="list-style-type: none"> • Maintenance of DTH, DVD and Dish TV etc. Testing and Repairing of audio and video. • CCTV installation and repairing • Making different types of LAN cable with their colour code. • Router configuration. • Study of components of a mother board. • Woofer and sound system repairing(making and repairing) • Induction, iron and heater repair and maintenance. • Stabilizer and single phase inverter repairing and maintenance. • Aurdino based projects. <ul style="list-style-type: none"> i. Digital clock using 16*2 LCD ii. Home automation using Bluetooth. 	48

ANNEXURE – E

DEC 3103 Electrical and Electronic Measurement (OLD)

Credits: 3

Semester III

L-T-P: 3-0-0

Module No.	Contents	Teaching Hours
Unit –I	A.C. FUNDAMENTALS Single-phase A.C. Circuits: Concept of complex impedance – Rectangular & polar form. R-L-C Series Circuit: Representation of impedance, voltage, current and power in complex form phasor diagram Impedance triangle – problems. Parallel Circuit: Phasor diagram, problems (maximum 3 branches).	12
Unit – II	TRANSFORMERS: Principle of operation. E.M.F equation, Voltage & Current relations., Transformer Definition regulation and efficiency; Elementary idea of losses in Transformer, open circuit and short circuit test. MEASUREMENT FUNDAMENTALS: Explanation of accuracy, precision, sensitivity, resolution, dynamic range, response and repeatability of measuring instruments. CRO construction and principle Measurement of Voltage, current and phase by CRO, Digital multimeter and signal generator.	12
Unit - III	TRANSDUCERS FUNDAMENTALS: Principle of operation of transducer and sensor – Their applications – Factors affecting the choice of transducer. Resistive transducers –strain gauge and derivation of gauge factor, inductive transducers-LVDT, RVDT, capacitive transducers, temperature transducers-, optical transducers,	12

Text Books:-

1. Fundamentals of Industrial Instrumentation A Fundamentals of Electric Circuit Alexander Mc Graw Hill
2. Electric Circuit David A. Bell Oxford
3. Circuits & Network Sukhua, Nagsarkar Oxford
4. A Text Book of Electrical Technology Part-I B.L. Thereja S. Chand & Co

References

1. Barua Wiley India Pvt Ltd
2. Instrumentation Devices & System Rangan, Sarma, Mani Mc Graw Hill

DEC 3203: Basic Electrical and Measurement (NEW)

Credits: 3

Semester III

L-T-P: 3-0-0

Introduction:

- Introduce students to the use of various electrical/electronic instruments, their construction, applications, and principles of operation, standards and units of measurements.

Objectives:

- Provide students with opportunities to develop basic skills in the design of electronic equipment's.

Module No.	Contents	Teaching Hours
Unit –I	Resistance: Fixed and variable, temperature coefficient , Capacitor, Inductor , ohm's law, Concept of power. TRANSFORMERS: Principle of operation. E.M.F equation, Voltage & Current relations., Transformer Definition regulation and efficiency; Elementary idea of losses in Transformer, open circuit and short circuit test	12
Unit – II	Introduction to DC machine- motor(series and shunt) and generator(series and shunt), AC machine- Single phase(induction machine and synchronous), Introduction to special machine(servo motor and stepper motor). MEASUREMENT FUNDAMENTALS: Explanation of accuracy, precision, sensitivity, resolution, dynamic range, response and repeatability of measuring instruments. CRO construction and principle Measurement of Voltage, current and phase by CRO, Digital multimeter and signal generator.	12
Unit - III	TRANSDUCERS FUNDAMENTALS: Principle of operation of transducer and sensor – Their applications – Factors affecting the choice of transducer. Resistive transducers –strain gauge and derivation of gauge factor, inductive transducers- LVDT, RVDT, capacitive transducers, temperature transducers-, optical transducers,	12

Text Books:-

1. Fundamentals of Industrial Instrumentation A Fundamentals of Electric Circuit Alexander Mc Graw Hill
2. Electric Circuit David A. Bell Oxford
3. Circuits & Network Sukhua, Nagsarkar Oxford
4. A Text Book of Electrical Technology Part-I B.L. Thereja S. Chand & Co

References

1. Barua Wiley India Pvt Ltd

DEC-4201: NETWORK ANALYSIS AND SYNTHESIS

Credits: 2

Semester IV

L-T-P: 3-0-0

Introduction: To introduce open circuit, short circuit, transmission, hybrid parameters and their interrelationship.

Objective:

1. To explain the basic concepts and laws of DC and AC electrical networks and solve them using mesh and nodal analysis technique
2. To introduce students with the fundamental concepts in graph theory.

Module No.	Contents	Teaching Hours
Unit –I	Active and passive, Linear and non-linear, Unilateral and bilateral, Lumped and distributed circuit, Time varying and time invariant parameter, Voltage and current sources (ideal and practical), Dependent and Independent sources, Source Transformation, KVL & KCL (Based Numerical), Mesh analysis and Nodal analysis, Conversion of star to delta & delta to star.	12
Unit – II	Network theorems: Superposition Theorem, Thevenin's Theorem, Norton's Theorem, and their application to 2 terminal D.C Networks. Maximum power transfer theorem for D.C. Circuit.(based Numerical) Two port network: Various two port circuit parameter: Evaluation of Z, Y, h and transmission (ABCD) parameters,	12
Unit - III	Transient Analysis: RL, RC and RLC circuits –classical approach. Network Functions: Concept of Complex frequency, Transform Impedances, Network functions of one port and two port networks, properties of driving point immittance and transfer function	12

Text Books:-

1. J. P. Ryder- Network Filters & Transmission Line- PHI
2. A. Chakravorty- An Introduction to Network, Filters & Transmission Line- Dhanpat Rai & Co.
3. D. R. Chaudhry- Network Analysis- Dhanpat Rai & Co.
4. V. K. Aatre- Network Theory & Filter Design- New Age International Pub.

GLA UNIVERSITY POLYTECHNIC

COURSE STRUCTURE, CONTACT HOURS and CREDITS

**DISCIPLINE: ELECTRONICS & COMMUNICATION
ENGINEERING SEMESTER: III (FULL-TIME)---(NEW)**

Sr. No.	Subject Code	Subject Name	Periods Per Week			Cr
			L	T	P/D	
1	DCS 3001	Programming in 'C'	3	0	0	3
2	DEC 3201	Basic Electronics	3	0	0	3
3	DEC 3102	Digital Electronics	3	0	0	3
4	DEC 3203	Basic Electrical and Measurement.	3	0	0	3
5	DCS 3081	Programming in 'C' Lab	0	0	4	2
6	DEC 3081	Basic Electronics Lab	0	0	4	2
7	DEC 3082	Digital Electronics Lab	0	0	4	2
7	DEC 3083	Electronics Instruments & Measurement Lab	0	0	4	2
8	DEC 3095	Soft Skills-I	0	0	2	1
9.	DEC 3086	Simulation lab	0	0	2	1
TOTAL			12	0	20	22

L- Lecture Period, T-Tutorial Period, P- Practical Period, D- Drawing Practice Period, Cr. - Credits,

GLA UNIVERSITY POLYTECHNIC

COURSE STRUCTURE, CONTACT HOURS and CREDITS

**DISCIPLINE : ELECTRONICS & COMMUNICATION
ENGINEERING SEMESTER: IV (FULL-TIME) ---- (NEW)**

Sr. No.	Subject Code	Subject Name	Periods Per Week			Cr
			L	T	P/D	
1	DEC-4201	Network Analysis & Synthesis	3	0	0	3
2	DEC-4202	Principal of Communication	3	0	0	3
3	DEC-4103	Electronic Devices & Circuits	3	0	0	3
4	DEC-4105	Microprocessor	3	0	0	3
5	DEC-4081	PCB-Design-Lab	0	0	4	2
6	DEC-4182	Principal of Communication Engineering Lab	0	0	4	2
7	DEC-4083	EDC Lab	0	0	4	2
8	DEC-4084	Microprocessor lab	0	0	4	2
9	DEC-4095	Soft Skills-II	0	0	2	1
10	DEC-4087	Matlab lab	0	0	2	1
TOTAL			12	0	20	22

L- Lecture Period, **T-**Tutorial Period, **P-** Practical Period, **D-** Drawing Practice Period, **Cr.** - Credits,

GLA UNIVERSITY POLYTECHNIC

COURSE STRUCTURE, CONTACT HOURS and CREDITS

**DISCIPLINE : ELECTRONICS AND COMMUNICATION
ENGINEERING SEMESTER: V SEM (FULL-TIME)-(NO
CHANGE)**

Sr. No.	Subject Code	Subject Name	Periods Per Week			Cr
			L	T	P/D	
1	DEC 5101	Electromagnetic Theory & Antennas	3	0	0	3
2	DEC 5003	Signal And System	3	0	0	3
3		Elective-I	3	0	0	3
4		Elective-II	3	0	0	3
5	DEC 5083	Robotics and Automation Lab	0	0	4	2
6		Elective-II Lab	0	0	4	2
7	DEC 5084	Seminar	0	0	2	1
8	DEC 5098	Project-I	0	0	4	2
9	DEC 5096	Display Devices Repairing and maintenance lab	0	0	4	2
10	DEC 5095	Soft Skill-III	0	0	2	1
TOTAL			12	0	20	22

L- Lecture Period, T-Tutorial Period, P- Practical Period, D- Drawing Practice Period, Cr. - Credit

ELECTIVE-I:

1. DEC 5004- RADAR AND TV
2. DEC 5005- AUDIO AND VIDEO ENG.
3. DEC 5006- EMBEDDED SYSTEM

ELECTIVE-II:

1. DEC 5007- VLSI DESIGN
2. DEC 5008- POWER ELECTRONICS
3. DEC 5109- CONTROL SYSTEM

ELECTIVE- II LAB

1. DEC 5087- VLSI DESIGN LAB
2. DEC 5088- POWER ELECTRONICS LAB
3. DEC 5189- CONTROL SYSTEM LAB

GLA UNIVERSITY POLYTECHNIC

COURSE STRUCTURE, CONTACT HOURS and CREDITS

**DISCIPLINE: ELECTRONICS AND COMMUNICATION
ENGINEERING. SEMESTER: VI SEM (FULL-TIME)---(NEW)**

Sr. No.	Subject Code	Subject Name	Periods Per Week			Cr
			L	T	P/D	
1	DEC 6101	MICROWAVE ENGINEERING	3	0	0	3
2	DEC 6102	OPTICAL FIBER COMMUNICATION	3	0	0	3
3		ELECTIVE-I	3	0	0	3
4		ELECTIVE-II	3	0	0	3
5	DEC 6183	OPTICAL FIBER COMMUNICATION LAB	0	0	6	3
6	DEC 6281	MICROWAVE ENGINEERING LAB	0	0	4	2
7	DEC 6098	PROJECT-II	0	0	4	2
8		ELECTIVE-III	0	0	4	2
9	DEC 6095	SOFT SKILL-IV	0	0	2	1
TOTAL			12	0	20	22

ELECTIVE- I:

1. DEC 6004: MECHATRONICS
2. DEC 6009: MODERN CONSUMER

ELECTIVE- II:

1. DEC 6007: WIRELESS AND COGNITIVE SYSTEM
2. DEC 6008: SATELLITE COMMUNICATION
3. DEC 6005 : DATA COMMUNICATION NETWORK

ELECTIVE- III:

4. DEC 6085: DIGITAL SYSTEM DESIGN LAB
5. DEC 6086: DISPLAY DEVICES AND MAINTENANCE LAB-II

ATR- We have deeply discussed the syllabi of second and third year diploma EC and finally the changes has been mentioned and successfully implemented.

Department of Training & Development
University Polytechnic

Agenda of the 2nd Meeting of Board of Studies to be held on May 17, 2021 at 04:00 pm in Online mode

AGENDA

- Item No. – 2.1:** **To confirm the minutes of the 1st BoS meeting held on 17 May, 2019**
- Item No. – 2.2:** **To report the action taken on the minutes of Ist meeting of Board of Studies held on 17 May, 2019**
- Item No. – 2.3:** **To introduce a new subject “DME 2095 Professional Practice II”**
- Item No. – 2.4:** **To discuss other items, if any (with the permission of chair)**

Dr. Vikas Kumar Sharma
Principal (Admin)
University Polytechnic
GLA University, Mathura

MINUTES OF 2nd MEETING
OF
BOARD OF STUDIES
(BOS)

DEPARTMENT OF TRAINING &
DEVELOPMENT
UNIVERSITY POLYTECHNIC



MAY 17, 2021

Department of English

University Polytechnic

**Minutes of the 2nd Meeting of Board of Studies held on May 17, 2021 at
04:00 pm in Online mode**

The following members were present:

1. Mr. Ashish Agrawal, Associate VP, Kolkata
2. Prof. Nitin Bhatnagar, HoD
3. Dr. Diwakar Bhardwaj
4. Dr. Vikas Sharma
5. Dr. Pankaj Sharma
6. Dharmendra Sharma, T & D

The Chairman Board of Studies welcomed all the members and started proceedings of the 2nd meeting of BoS in accordance with the Agenda note circulated earlier.

Agenda Item – 2.01: To confirm the minutes of the 1st BoS meeting.

The minutes of the meeting of 1stBoS held on May 17th, 2019 are enclosed as Annexure A

Agenda Item – 2.02: Action Taken Report (ATR)

The ATR based on the minutes of the 1st BoS is as follows:

Agenda Item	Description	Action Taken
1	Change in Code and Title of the Syllabus	Suggestions Incorporated (See Annexure A)
2	Modifications in Syllabus	Suggestions Incorporated (See Annexure A)

Agenda Item – 2.03: To introduce a new subject “DME 2095 Professional Practice II”

- ❖ First of all, the need to introduce this new subject in second semester of Diploma Program of University Polytechnic was discussed. As of now, in second semester there is no such subject is being taught which is creating a gap of six months. So, to fill this gap, all members agreed on the inclusion of this course.
- ❖ Then proposed syllabus was discussed in detail where Mr. Nitin Bhatnagar suggested to focus on Soft Skills such as Team Working, Problem Solving Leadership Skills and Positive Thinking in the first module. Our External Expert, Mr. Ashish Agrawal also agreed on it and suggested to include activities to impart these skills.
- ❖ On all other topics in proposed syllabus, all the members were satisfied and agreed that all these topics will bring desired outcomes.

Agenda Item – 2.04: To discuss other items, if any (with the permission of chair)

SUBJECT	EXISTING CONTENT	MODIFIED CONTENT	REMARKS
Professional Practice(DME 1095)	The existing content remains same but few topics are shifted from one module to another as per the experts advice.	'Everyday Expressions' in second module transferred to first module	Recommended by BoS committee.

It was decided that one credit of tutorial of Engineering Drawing-I and II has to be shifted to professional practice and Engineering mechanic lab in both semester as DME 1283 and DME2083. Therefore the codes DME1281 to DME1381 and DME2081 to DME2181 with 2 credits.

Annexure B: Proposed Syllabus “DME 2095 Professional Practice II”

Annexure C: New Syllabus “DME 2095 Professional Practice II”(After Modifications)

Annexure D: Old Syllabus “DME 1095 Professional Practice”

Annexure E: New Syllabus “DME 1195 Professional Practice I” (After Modifications)

Annexure F: Course Structure of Ist year

Note: **Highlighted in Green** are the changes proposed by BoS.

The meeting ended with thanks to the chair.

Dr. Vikas Kumar Sharma
Principal (Admin)
University Polytechnic
GLA University, Mathura

Prof. Diwakar Bharadwaj
Principal (Academic)
University Polytechnic
GLA University, Mathura

ANNEXURE A

(Minutes of the 1st Board of Studies Meeting)

**DEPARTMENT OF ENGLISH
UNIVERSITY POLYTECHNIC**

The Minutes of the 1st Meeting of Board of Studies (BoS) held on 17th May 2019 [Friday]

Date: 17.05.2019

Members Present:

1. Prof. Nitin Bhatnagar, HoD, Department of English, GLA U. (External)
2. Dharmendra Sharma, Trainer, Training and Development (Internal)
3. Dr. Vivek Kumar, Lecturer, University Polytechnic, GLA U. (Internal)
4. Dr. Pooja Verma, Lecturer, University Polytechnic, GLA U. (Internal)
5. Ms. Hina Agrawal, Lecturer, University Polytechnic, GLA U. (Internal)

The Chairman, Board of Studies (BoS) welcomed all the members and started the proceedings of 1st Meeting of BoS in accordance with the Agenda communicated earlier (copy attached).

The following Minutes against the Agenda were discussed in the meeting:

Item 01.01: A long discussion on the improvement and modification of the Title and Content of the Syllabus of the First Year Diploma - in:

- A. Current Title and Code : DME 1084 : Field and Visit Presentation
- B. Proposed Title and Code : DME 1095 : Professional Practice

The Experts and the other members gave their view regarding the improvement in the content of the Syllabus.

Item 01.02: The ATR for the improvement and modification of the Syllabus was presented.

Item 01.03: The Code and the Title of the Syllabus were changed resulting the change in the contents of the syllabus.

Both, the Old and New copies of the Syllabus of the First Year Diploma - Field and Visit Presentation /Professional Practice attached.

Prof. Nitin Bhatnagar	Dharmendra Sharma	Dr. Vivek Kumar	Dr. Pooja Verma	Ms. Hina Agrawal
HoD, Department of English, GLA U.	Training and Development GLA U	Lecturer Dept. of English, University Polytechnic, GLA U.	Lecturer University Polytechnic, GLA U.	Lecturer University Polytechnic, GLA U.

ANNEXURE B

(DME 2095 Professional Practice II)

(Proposed Syllabus)

COURSE SYLLABUS
DME 2095: Professional Practice II

The core objective of this course is to improve the overall Personality, English Communication and Presentation skills of the target students.

Module No	Credit 1	Content	L-T-P: 0-0-2	Teaching Hours
I		Understanding Listening Skills Building Confidence in Presentations Practice Session of Listening Skills through Audio Video Clips Vocabulary Verbs (First, Second and Third Forms and their uses) Random Topic or Essay Writing and Presentation Group Discussion Topic 1 and 2 Debate Topic 1 and 2 Vocabulary Test Just a Minute Session		12
II		Presentation Formal Introduction Sentence Making (Spoken Perspective) Describing Technical Terms Activity- Attributes of a Successful Personality Vocabulary in terms of Noun, Adjectives etc. Group Discussion Topic 3 and 4 Debate Topic 3 and 4 Story Translation Vocabulary Test and Role Plays Group Discussion Topic 5 and 6		12

ANNEXURE C

(DME 2095 Professional Practice II)

(After Modifications)

DME 2095: Professional Practice II

The core objective of this course is to improve the overall Personality, English Communication and Presentation skills of the target students.

Module No	Credit 1	Content	L-T-P: 0-0-2	Teaching Hours
I		Understanding Listening Skills (Practice through Audio Video Clips) Building Confidence in Presentations Understanding Team Working Vocabulary Verbs (First, Second and Third Forms and their uses) Understanding Leadership and Positive Thinking Understanding Problem Solving Group Discussion Topic 1 and 2 Debate Topic 1 and 2 Vocabulary Verbs (Test) Just a Minute Session		12
II		Presentation Formal Introduction Sentence Making (Spoken Perspective - Revising all Tenses and Passive Sentences) Describing Technical Terms using Simple Sentences Activity- Attributes of a Successful Personality Vocabulary in terms of Noun, Adjectives etc. (Word Family) Group Discussion Topic 3 and 4 Debate Topic 3 and 4 Story Translation and Presentation Vocabulary Test and Role Plays Group Discussion Topic 5 and 6		12

(Recommended by BoS for the approval of the Academic Council)

Recommended Readings:

- Dr. K. Alex, “Soft Skills – Know Yourself Know the World”, S. Chand.
- Barun K. Mitra, “Personality Development and Soft Skills”, Oxford University Press.
- Comfort, Jeremy (et.al), “Speaking Effectively”, London: Cambridge.
- Sheetal Desarda, “Master the Group Discussion and Personal Interview”, Notion Press.
- Kumkum Gupta, “Everyday Vocabulary”, Arihant Publications.

Note: Latest Editions of all suggested books are recommended.

The Course Outcomes:

After the completion of this Course, the target students will be:

- Utilizing effective Listening Skills to become confident communicator.
- Leading the teams and working well with team members.
- Solving Problems with positive attitude.
- Presenting himself confidently and interacting with people in English with daily used vocabulary.
- Representing their views and ideas for the given problems in group discussions.

ANNEXURE D

(DME 1095 Professional Practice)

Approved by the Board of Studies (BoS) held on 17th May 2019 [Friday]

(Old Syllabus)

DME 1095: Professional Practice

The core objective of this course is to improve the overall Personality, English Communication and Presentation skills of the target students.

Module No.	Credits: 1	Content	L-T-P: 0-0-2	Teaching Hours
I	What is Soft Skills? Talk on Personality	Interaction with the Students Tracking Yourself Appearance or Attire Know Your Body Language Practice Session Understanding Communication How to be Self-Motivated Goal Setting Time Management		12
II	Communication Skills	Formal Introduction Presentation Formal Introduction Elementary Vocab-1 Sentence Making (Spoken Perspective) Everyday Expressions Practice Session Monologues Elementary Vocab-2 How to describe objects Presentation of Describing Objects		12

III	<p>Group Discussion</p> <p>Do's and Don'ts Topic-1 Topic-2 Topic-3 Topic-4</p>	12
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ANNEXURE E

(DME 1195 Professional Practice)

(After Modifications)

DME 1195: Professional Practice-I

The core objective of this course is to improve the overall Personality, English Communication and Presentation skills of the target students.

Module No.	Credits: 1	Content	L–T–P: 0-0-2	Teaching Hours
I	What is Soft Skills? Talk on Personality	Interaction with the Students Tracking Yourself - Time Management Everyday Expressions Appearance or Attire Know Your Body Language Practice Session Understanding Communication How to be Self-Motivated Goal Setting		12
II	Communication Skills	Formal Introduction Presentation Formal Introduction Elementary Vocab-1 Sentence Making (Declarative, Interrogative and Exclamatory) Practice Session Monologues Elementary Vocab-2 How to describe objects Presentation of Describing Objects		12
III	Group Discussion	Do's and Don'ts Topic-1 Topic-2 Topic-3 Topic-4		12

(Recommended by BoS for the approval of the Academic Council)

Recommended Readings:

- Dixon, Robert J. Every day, “Dialogues in English”, Prentice-Hall of India Ltd.
- Blum, M. Rosen, “How to Build Better Vocabulary”, London: Bloomsbury Publication.
- Comfort, Jeremy (et.al), “Speaking Effectively”, London: Cambridge.
- Singh, R.P. and Pandey, “Manual of Practical Communication”, Delhi: A.I.T.B.S. Publications India Ltd.

Note: Latest Editions of all suggested books are recommended.

The Course Outcomes:

After the completion of this Course, the target students will be:

- Introducing themselves with confidence.
- Interacting in public gatherings with self-confidence.
- Carrying themselves well with positive Body Language.
- Setting and trying to achieve their goals. Managing their

time productively without procrastination.

ANNEXURE F

Course Structure (Ist Year)

GLA UNIVERSITY POLYTECHNIC
COURSE STRUCTURE, CONTACT HOURS and

DISCIPLINE : COMMON TO ALL
SEMESTER : I SEM (FULL-TIME)

Sr. No.	Subject Code	Subject Name	Periods Per Week			Cr
			L	T	P/D	
1	DHS 1101	English Communication –I	3	1	0	3
2	DHS 1002	Applied Mathematics -I	3	2	0	4
3	DHS 1003	Applied Physics-I	3	0	0	3
4	DHS 1204	Applied Chemistry-I	2	0	0	2
5	DME 1381	Engineering Drawing-I	0	0	4	2
7	DME 1182	Workshop Practice - I	0	1	4	3
8	DHS 1282/ DHS 1081	Applied Chemistry Lab / Applied Physics Lab	0	0	2	1
9	DCS 1181	Computer Lab I	0	1	2	2
10	DME 1283	Engineering Mechanics Lab-I	0	0	2	1
11	DME 1195	Professional Practice - I	0	0	2	1
TOTAL			11	5	16	22

GLA UNIVERSITY POLYTECHNIC
COURSE STRUCTURE, CONTACT HOURS and

DISCIPLINE **COMMON TO ALL**
SEMESTER : **II SEM (FULL-TIME)**

Sr. No.	Subject Code	Subject Name	Periods Per Week			Cr
			L	T	P/D	
1	DHS 2101	English Communication –II	3	1	0	3
2	DHS 2002	Applied Mathematics -II	3	2	0	4
3	DHS 2003	Applied Physics-II	3	0	0	3
4	DHS 2204	Applied Chemistry-II	2	0	0	2
5	DME 2181	Engineering Drawing-II	0	0	4	2
7	DME 2082	Workshop Practice - II	0	1	4	3
8	DHS 1282/ DHS 1081	Applied Chemistry Lab / Applied Physics Lab	0	0	2	1
9	DCS 2181	Computer Lab II	0	1	2	2
10	DME 2083	Engineering Mechanics Lab-II	0	0	2	1
11	DME 2095	Professional Practices –II	0	0	2	1
TOTAL			11	5	16	22

GLA UNIVERSITY POLYTECHNIC

COURSE STRUCTURE, CONTACT HOURS and CREDITS

DISCIPLINE: ELECTRONICS & COMMUNICATION

ENGINEERING SEMESTER: III (FULL-TIME)---(NEW)

Sr. No.	Subject Code	Subject Name	Periods Per Week			Cr
			L	T	P/D	
1	DCS 3101	Programming in 'C'	3	0	0	3
2	DEC 3201	Basic Electronics	3	0	0	3
3	DEC 3102	Digital Electronics	3	0	0	3
4	DEC 3203	Basic Electrical and Measurement.	3	0	0	3
5	DCS 3081	Programming in 'C' Lab	0	0	4	2
6	DEC 3081	Basic Electronics Lab	0	0	4	2
7	DEC 3082	Digital Electronics Lab	0	0	4	2
7	DEC 3083	Electronics Instruments & Measurement Lab	0	0	4	2
8	DEC 3095	Soft Skills-I	0	0	2	1
9.	DEC 3086	Simulation lab	0	0	2	1
TOTAL			12	0	20	22

L- Lecture Period, T-Tutorial Period, P- Practical Period, D- Drawing Practice Period, Cr. - Credits,

GLA UNIVERSITY POLYTECHNIC

COURSE STRUCTURE, CONTACT HOURS and CREDITS

DISCIPLINE : ELECTRONICS & COMMUNICATION ENGINEERING

SEMESTER: IV (FULL-TIME) (NEW)

Sr. No.	Subject Code	Subject Name	Periods Per Week			Cr
			L	T	P/D	
1	DEC-4201	Network Analysis & Synthesis	3	0	0	3
2	DEC-4202	Principal of Communication	3	0	0	3
3	DEC-4103	Electronic Devices & Circuits	3	0	0	3
4	DEC-4105	Microprocessor	3	0	0	3
5	DEC-4081	PCB-Design-Lab	0	0	4	2
6	DEC-4182	Principal of Communication Engineering Lab	0	0	4	2
7	DEC-4083	EDC Lab	0	0	4	2
8	DEC-4084	Microprocessor lab	0	0	4	2
9	DEC-4095	Soft Skills-II	0	0	2	1
10	DEC-4087	Matlab lab	0	0	2	1
TOTAL			12	0	20	22

L- Lecture Period, **T-**Tutorial Period, **P-** Practical Period, **D-** Drawing Practice Period, **Cr.** – Credits

GLA UNIVERSITY POLYTECHNIC

COURSE STRUCTURE, CONTACT HOURS and CREDITS

**DISCIPLINE : ELECTRONICS AND COMMUNICATION
ENGINEERING SEMESTER: V SEM (FULL-TIME)-(NO
CHANGE)**

Sr. No.	Subject Code	Subject Name	Periods Per Week			Cr
			L	T	P/D	
1	DEC 5101	Electromagnetic Theory & Antennas	3	0	0	3
2	DEC 5003	Signal And System	3	0	0	3
3		Elective-I	3	0	0	3
4		Elective-II	3	0	0	3
5	DEC 5083	Robotics and Automation Lab	0	0	4	2
6		Elective-II Lab	0	0	4	2
7	DEC 5084	Seminar	0	0	2	1
8	DEC 5098	Project-I	0	0	4	2
9	DEC 5096	Display Devices Repairing and maintenance lab	0	0	4	2
10	DEC 5095	Soft Skill-III	0	0	2	1
TOTAL			12	0	20	22

L- Lecture Period, T-Tutorial Period, P- Practical Period, D- Drawing Practice Period, Cr. - Credit

ELECTIVE-I:

1. DEC 5004- RADAR AND TV
2. DEC 5005- AUDIO AND VIDEO ENG.
3. DEC 5006- EMBEDDED SYSTEM

ELECTIVE-II:

1. DEC 5007- VLSI DESIGN
2. DEC 5008- POWER ELECTRONICS
3. DEC 5109- CONTROL SYSTEM
- 4.

ELECTIVE- II LAB

1. DEC 5087- VLSI DESIGN LAB
2. DEC 5088- POWER ELECTRONICS LAB
3. DEC 5189- CONTROL SYSTEM LAB

GLA UNIVERSITY POLYTECHNIC

COURSE STRUCTURE, CONTACT HOURS and CREDITS

**DISCIPLINE: ELECTRONICS AND COMMUNICATION
ENGINEERING. SEMESTER: VI SEM (FULL-TIME)---(NEW)**

Sr. No.	Subject Code	Subject Name	Periods Per Week			Cr
			L	T	P/D	
1	DEC 6101	MICROWAVE ENGINEERING	3	0	0	3
2	DEC 6102	OPTICAL FIBER COMMUNICATION	3	0	0	3
3		ELECTIVE-I	3	0	0	3
4		ELECTIVE-II	3	0	0	3
5	DEC 6183	OPTICAL FIBER COMMUNICATION LAB	0	0	6	3
6	DEC 6281	MICROWAVE ENGINEERING LAB	0	0	4	2
7	DEC 6098	PROJECT-II	0	0	4	2
8		ELECTIVE-III	0	0	4	2
9	DEC 6095	SOFT SKILL-IV	0	0	2	1
TOTAL			12	0	20	22

ELECTIVE- I:

1. DEC 6004: MECHATRONICS
2. DEC 6009: MODERN CONSUMER

ELECTIVE- II:

1. *DEC 6007: WIRELESS AND COGNITIVE SYSTEM*
2. DEC 6008: SATELLITE COMMUNICATION
3. DEC 6005 : DATA COMMUNICATION NETWORK

ELECTIVE- III:

4. *DEC 6085: DIGITAL SYSTEM DESIGN LAB*
5. DEC 6086: DISPLAY DEVICES AND MAINTENANCE LAB-II

GLA UNIVERSITY POLYTECHNIC

COURSE STRUCTURE, CONTACT HOURS and CREDITS

**DISCIPLINE: ELECTRONICS & COMMUNICATION
ENGINEERING SEMESTER: III (FULL-TIME)---(NEW)**

Sr. No.	Subject Code	Subject Name	Periods Per Week			Cr
			L	T	P/D	
1	DCS 3101	Programming in 'C'	3	0	0	3
2	DEC 3201	Basic Electronics	3	0	0	3
3	DEC 3102	Digital Electronics	3	0	0	3
4	DEC 3203	Basic Electrical and Measurement.	3	0	0	3
5	DCS 3081	Programming in 'C' Lab	0	0	4	2
6	DEC 3081	Basic Electronics Lab	0	0	4	2
7	DEC 3082	Digital Electronics Lab	0	0	4	2
7	DEC 3083	Electronics Instruments & Measurement Lab	0	0	4	2
8	DEC 3095	Soft Skills-I	0	0	2	1
9.	DEC 3086	Simulation lab	0	0	2	1
TOTAL			12	0	20	22

L- Lecture Period, T-Tutorial Period, P- Practical Period, D- Drawing Practice Period, Cr. - Credits,

DCS 3101: PROGRAMMING IN 'C'

Introduction: The course provides a fast-paced introduction to the C programming language as beginner.

Objective: This course is designed to provide a comprehensive study of the C programming language. It stresses the strengths of C, which provide students with the means of writing efficient, maintainable, and portable code. The nature of C language is emphasized in the wide variety of examples and applications. To learn and acquire art of computer programming. To know about some popular programming languages and how to choose Programming language for solving a problem.

Credits: 3

Semester-III

L-T-P: 3-0-0

Module No.	Contents	Teaching Hours
I	<p>Basics of C:- History of C, C character set, tokens, constants, variables, keywords, operators (arithmetic, Logical, assignment, relational, increment, and decrement, conditional, bit wise, special, operator, precedence), C expressions data types, Formatted input, formatted output.</p> <p>Decision making:- Decision making and branching, if statement (if, if-else, else-if ladder, nested if-else), Switch case statement, break statement. Decision making and looping while, do, do-while statements for loop, continue statement.</p> <p>Arrays and Strings:- Declaration and initialization of one dimensional, two dimensional and character arrays, accessing array elements. Declaration and initialization of string variables, string handling functions.</p>	18
II	<p>Functions:- Need of functions, scope and lifetime of variables, defining functions, function call (call by value, call by reference), return values, storage classes. Category of function (No argument No return value, No argument with return value, argument with return value), recursion.</p> <p>Structure:- Defining structure, declaring and accessing structure members, initialization of structure, arrays of structure, union, difference between structure and union.</p> <p>Pointers:- Understanding pointers, declaring and accessing pointers, Pointers arithmetic, pointers and arrays.</p>	18

Reference Books/ Text Books

- Schaum Series, Programming in C, McGraw Hills Publishers, New York.

- Yashwant Kanetkar, Exploring – BPB Publications, New Delhi.
- Complete reference C, BY Herbert Shield, Tata Mc-Graw Hill
- The C++ Programming Language by Stroustrup, Bjarne 3rd.ed. New Delhi :Pearson Education, c2000

Intended Outcomes: A student who successfully completes the course will have the ability to:

- Understand the basic terminology used in computer programming
- Write, compile and debug programs in c language.
- Use different data types in a computer program.
- Design programs involving decision structures, loops and functions.
- Explain the difference between call by value and call by reference
- Understand the dynamics of memory by the use of pointers.
- Use different data structures and create/update basic data files.

DEC 3201 – BASIC ELECTRONICS (NEW)

Semester III

Credits: 3

L-T-P: 3-0-0

Introduction:

This subject introduces basic semiconductors, diodes working the basic circuit operations of analog electronics.

Objective: The objective of this Course is to provide the students with an introductory and broad treatment of the field of Electronics Engineering.

Module No.	Contents	Teaching Hours
Unit –I	<p>Semiconductor Physics: Basic of Semiconductor materials and effect of temperature on semiconductor.</p> <p>PN Junction Diode: P-N junction diode with its Forward & Reverse Characteristics.</p> <p>Rectifiers & Filters: Rectifier circuit (HWR, FWR). Their comparison on the basis of circuit operation, ripple factor, ripples frequency, transformer utilization factor, and rectification efficiency.</p>	12
Unit – II	<p>Clipping & Clamping circuits: Types and applications.</p> <p>Voltage multiplier circuits: Types and application</p> <p>Special purpose diode: Light Emitting Diode, Liquid Crystal Display, Tunnel diode (with tunneling function), Zener diode and its numerical problems.</p> <p>Bipolar Junction Transistor (BJT): Construction, working principle of PNP and NPN transistors, characteristics of CB, CE and CC configurations. D.C load line, Thermal stability factor.</p>	12
Unit - III	<p>FET- Introduction to JFET, MOSFET- n channel and P channel</p> <p>Introduction to power electronics devices</p> <p>Power MOSFET, SCR, UJT, IGBT, DIAC, TRIC with characteristics</p>	12

RECOMMENDED BOOK

1. Electronic Devices and Circuit Theory, 9th Edition by Robert Boylestad & LouisNashelsky, Prentice Hall India Private Limited.

Reference Books:-

2. Electronic Principles,7th Edition by Albert Paul Malvino, (Tata McGraw - Hill Publishing Company Ltd).
3. Electronic Devices and Circuits, 5th Edition by David Bell, Oxford University Press.
4. Basic Electronics and Linear Circuits, 4th Edition by Bhargava, Kulshresthaand Gupta (Tata McGraw

DEC-3102: DIGITAL ELECTRONICS

Credits: 3

Semester III

L-T-P: 3-0-0

Module No.	Contents	Teaching Hours
Unit – I	<p>Introduction To Digital Techniques:</p> <p>Number System – Introduction to Binary, Octal, Decimal, Hexadecimal number system, Conversion of number systems, 1's complement and 2's complement, Binary arithmetic (addition, subtraction). BCD code, BCD arithmetic (addition, subtraction). Logic Gates And Boolean Algebra:- Logical symbol, logical expression and truth table of AND, OR, NOT, NAND, NOR, EX-OR and EX-NOR gates. Universal gates – NAND and NOR gates. Basic laws of Boolean algebra, Duality theorem. De Morgan's theorems.</p>	12
Unit – II	<p>Combinational Logic Design/Circuits:- Simplification of Boolean expression using Boolean algebra, Construction of logical circuits from Boolean expressions, K-map representation of logical functions, Minimization of logical expressions using K-map (2, 3, 4 variables). Standardization of SOP & POS equations, Concept of Adders / Sub tractors, Truth table, K-map, Simplified logical expression and logical circuit using basic gates and universal gates of: (a) Half adder and full adder (b) Half sub tractor and full sub tractor. Block diagram, Truth table, Logical expression and logic diagram of Multiplexers (4:1 and 8:1),</p>	12
Unit – III	<p>Flip Flops And Sequential Logic Design:- Symbol and Logic diagram using NAND gates, working principle, timing diagram of Clocked S R, J K, D & T flip flop. Registers- SISO, SIPO, PIPO, PISO. Counters- Asynchronous and synchronous Memories: - Classification of memories, RAM, ROM, PROM, EPROM, EEPROM.</p>	12

Text Books:-

1. Malvino & Leach "Digital Principles and Applications", Tata McGraw Hill, Delhi.
2. Gayakwad R.A. "Op-Amps and Linear Integrated Circuits", Prentice Hall of India, Delhi.

Reference Books:-

3. Taub & Schilling "Digital Electronics", Tata McGraw Hill, Delhi.
4. Nagrath IJ. "Electronics Analog and Digital", Prentice Hall of India Ltd Delhi.
5. Jain R.P. "Modern Digital Electronics", Tata Mc-Graw Hill Delhi.

DEC 3203: Basic Electrical and Measurement (NEW)

Credits: 3

Semester III

L-T-P: 3-0-0

Introduction:

- Introduce students to the use of various electrical/electronic instruments, their construction, applications, and principles of operation, standards and units of measurements.

Objectives:

- Provide students with opportunities to develop basic skills in the design of electronic equipment's.

Module No.	Contents	Teaching Hours
Unit –I	Resistance: Fixed and variable, temperature coefficient , Capacitor, Inductor , ohm's law, Concept of power. TRANSFORMERS: Principle of operation. E.M.F equation, Voltage & Current relations., Transformer Definition regulation and efficiency; Elementary idea of losses in Transformer, open circuit and short circuit test	12
Unit – II	Introduction to DC machine- motor(series and shunt) and generator(series and shunt), AC machine- Single phase(induction machine and synchronous), Introduction to special machine(servo motor and stepper motor). MEASUREMENT FUNDAMENTALS: Explanation of accuracy, precision, sensitivity, resolution, dynamic range, response and repeatability of measuring instruments. CRO construction and principle Measurement of Voltage, current and phase by CRO, Digital multimeter and signal generator.	12
Unit - III	TRANSDUCERS FUNDAMENTALS: Principle of operation of transducer and sensor – Their applications – Factors affecting the choice of transducer. Resistive transducers –strain gauge and derivation of gauge factor, inductive transducers-LVDT, RVDT, capacitive transducers, temperature transducers-, optical transducers,	12

Text Books:-

1. Fundamentals of Industrial Instrumentation A Fundamentals of Electric Circuit Alexander Mc Graw Hill
2. Electric Circuit David A. Bell Oxford
3. Circuits & Network Sukhua, Nagsarkar Oxford
4. A Text Book of Electrical Technology Part-I B.L. Thereja S. Chand & Co

References

1. Barua Wiley India Pvt Ltd

DCS 3081: PROGRAMMING IN 'C' LAB (NEW)

Credits: 2

Semester-III

L–T–P: 0–0–4

LIST OF

Module No.	Contents	Teaching Hours
1.	Programming Exercise on Executing and Editing, defining Variable and assigning values to variables. Programming Exercise on formatting input/output using printf and scanf.	48
2.	Programming Exercise on arithmetic's and relational operators. Programming Exercise on arithmetic expression and their evaluation.	
3.	Programming Exercise using if, if-else statement. Programming Exercise using nested if statement.	
4.	Programming Exercise on switch statement Programming Exercise on for statement.	
5.	Programming Exercise on while and do-while statement.	
6.	Programming Exercise on functions. Programming Exercise on arrays (single dimension)	
7.	Programming Exercise on structure. Programming Exercise on Pointers. <i>Note: Basic mini Project in 'C' in groups.</i>	

DEC-3081: BASIC ELECTRONICS LAB

Credits: 2

Semester III

L-T-P: 0-0-4

List of Practical

Exp No.	Contents	Teaching Hours
1	<p>a) Identification and testing of electronic components such as resistor, inductor, capacitor, diode, transistor and different types of switches used in Electronic circuits</p> <p>b) Measurement of resistances using multimeter and their comparison with color code values.</p> <p>Study of V-I characteristics of a Semiconductor diode and to calculate its static and dynamic resistance.</p>	48
2	Study of Zener diode as a voltage regulator and finding its reverse breakdown voltage..	
3	Observation of input and output wave shapes of a half-wave rectifier and verification and relationship between dc output and ac input voltage.	
4	Observation of input and output wave shapes of a full wave rectifier and verification and relationship between dc and ac input voltage.	
5	Observation of input and output wave shapes of a Bridge full wave rectifier and verification and relationship between dc and ac input voltage.	
6	Study of different types of filter circuits (shunt capacitor, series inductor).	
7	Plotting input and output characteristics of a transistor in CB configuration.	
8	Plotting input and output characteristics of a transistor in CE configuration.	
9	Plotting input and output characteristics of a transistor in CE configuration.	
10	To measure the voltage gain and band width by plotting frequency response curve of a single stage amplifier using CE configuration at different loads.	
11	To plot V-I characteristics of a FET.	

List of experiments for advance learners:

1. Study of Rectifier circuit using PSPICE.
2. Study of Filter circuit using PSPICE.
3. Study of V-I characteristics of a Semiconductor diode and Zener diode to using Simulation.

DEC-3082: DIGITAL ELECTRONICS LAB

Credits: 2

Semester III

L-T-P: 0-0-4

List of Practical

Module No.	Contents	Teaching Hours
1	Verification of truth table of AND, OR, NOT, NAND, NOR, EXOR gate.	48
2	To realize different Boolean expressions with logic gates.	
3	Verification of NAND and NOR gate as universal gates.	
4	To realize half adder and full adder by using different logic gates.	
5	To realize half subtractor and full subtractor by using different logic gates.	
6	Construction of half adder and full adder circuits using only NAND gate.	
7	Verify the operation of 4 bit multiplexer using an IC.	
8	Verify the operation of de-multiplexer (2:4 and 3:8) using an IC.	
9	Verify the operation of decoder (1:2 and 2:4) using an IC.	
10	Verify the operation of encoder (2:1 and 4:2) using an IC.	
11	Verify operation of SR, JK, D, flip-flop using different logic gates.	
12	To implement 4bit shift register.	

List of experiments for advance learners:

1. Verification of truth table for AND, OR, NOT, NAND, EX-OR, NOR gate using PSPICE.
2. Verification of NAND and NOR gate as universal gates using PSPICE.
3. Study of half - adder and full adder circuits using PSPICE
4. Verify the operation of multiplexer (4:1) using PSPICE.
5. Verify the operation of de-multiplexer(1:4) using PSPICE

DEC-3083: ELECTRONICS INSTRUMENTATION & MEASUREMENTS LAB

Credits: 2

Semester III

L-T-P: 0-0-4

List of Practical

Module No.	Contents	Teaching Hours
	<ol style="list-style-type: none"> 1. To measure the level of a liquid using a transducer 2. Study of variable capacitive transducer 3. Draw the characteristics of a potentiometer 4. To measure linear displacement using LVDT 5. To study the use of electrical strain gauge 6. To study weighing machine using load cell 7. Speed Measurement by using magnetic pickup. 8. Displacement or position measurement by ultrasonic displacement. 9. To measure temperature using a thermo-couple 10. Study and use of digital temperature controller 11. Use of Thermistor in ON/OFF transducer 12. Plot the Characteristics of Thermistor. 13. To study pH meter. 14. To study the CRO and CRT 15. Measurement of amplitude and frequency of a signal with the help of CRO 16. To study DSO 	48

List of Experiments for advance learners:

1. Study of Wattmeter
2. Use of LCR meter for measuring inductance, capacitance and resistance.
3. To measure the value of earth resistance using earth tester.

DEC 3086: SIMULATION LAB

Credits: 1

Semester: III

L-T-P: 0-0-2

Contents	Teaching Hours
<ul style="list-style-type: none">• Verification of Half-Wave and Full-Wave Rectifier• Frequency Response of CE Amplifier• Frequency Response of CS Amplifier• Frequency Response of CC Amplifier• Design of Wein-Bridge Oscillator• Verification of Clippers & Clampers• Design and Verification of RC coupled amplifier• Design and Verification of Voltage Regulator• Design and Verification of Attenuators• Design and Verification of Differential amplifier	24

GLA UNIVERSITY POLYTECHNIC

COURSE STRUCTURE, CONTACT HOURS and CREDITS

DISCIPLINE : ELECTRONICS & COMMUNICATION ENGINEERING SEMESTER: IV (FULL-TIME) (NEW)

Sr. No.	Subject Code	Subject Name	Periods Per Week			Cr
			L	T	P/D	
1	DEC-4201	Network Analysis & Synthesis	3	0	0	3
2	DEC-4202	Principal of Communication	3	0	0	3
3	DEC-4103	Electronic Devices & Circuits	3	0	0	3
4	DEC-4105	Microprocessor	3	0	0	3
5	DEC-4081	PCB-Design-Lab	0	0	4	2
6	DEC-4182	Principal of Communication Engineering Lab	0	0	4	2
7	DEC-4083	EDC Lab	0	0	4	2
8	DEC-4084	Microprocessor lab	0	0	4	2
9	DEC-4095	Soft Skills-II	0	0	2	1
10	DEC-4087	Matlab lab	0	0	2	1
TOTAL			12	0	20	22

L- Lecture Period, T-Tutorial Period, P- Practical Period, D- Drawing Practice Period, Cr. – Credits

DEC-4201: NETWORK ANALYSIS AND SYNTHESIS

Credits: 2

Semester IV

L-T-P: 3-0-0

Introduction: To introduce open circuit, short circuit, transmission, hybrid parameters and their interrelationship.

Objective:

1. To explain the basic concepts and laws of DC and AC electrical networks and solve them using mesh and nodal analysis technique
2. To introduce students with the fundamental concepts in graph theory.

Module No.	Contents	Teaching Hours
Unit –I	Active and passive, Linear and non-linear, Unilateral and bilateral, Lumped and distributed circuit, Time varying and time invariant parameter, Voltage and current sources (ideal and practical), Dependent and Independent sources, Source Transformation, KVL & KCL (Based Numerical), Mesh analysis and Nodal analysis, Conversion of star to delta & delta to star.	12
Unit – II	Network theorems: Superposition Theorem, Thevenin's Theorem, Norton's Theorem, and their application to 2 terminal D.C Networks. Maximum power transfer theorem for D.C. Circuit.(based Numerical) Two port network: Various two port circuit parameter: Evaluation of Z, Y, h and transmission (ABCD) parameters,	12
Unit - III	Transient Analysis: RL, RC and RLC circuits –classical approach. Network Functions: Concept of Complex frequency, Transform Impedances, Network functions of one port and two port networks, properties of driving point immittance and transfer function	12

Text Books:-

1. J. P. Ryder- Network Filters & Transmission Line- PHI
2. A. Chakravorty- An Introduction to Network, Filters & Transmission Line- Dhanpat rai & Co.
3. D. R. Chaudhry- Network Analysis- Dhanpat Rai & Co.
4. V. K. Aatre- Network Theory & Filter Design- New Age International Pub.

DEC-4202: PRINCIPLES OF COMMUNICATION (NEW)

Credits: 3

Semester IV

L-T-P: 3-0-0

INTRODUCTION:

To introduce the concepts of various analog modulations and their spectral characteristics

OBJECTIVES:

- To understand the properties of communication process.
- To know the effect of noise on communication systems.

Module No.	Contents	Teaching Hours
Unit – I	<p>INTRODUCTION: Block diagram of communication system</p> <p>AMPLITUDE MODULATION Introduction, Amplitude Modulation: Time and frequency- domain description, switching modulator, Envelope Detector.</p> <p>DSBSC: Time and frequency- Domain description, Ring modulator, coherent detection, SSB and VSB Method of Modulation; SSB Modulation, VSB modulation.</p>	12
Unit – II	<p>Angle Modulation: Basic definitions,</p> <p>Frequency Modulation: Narrow Band FM, Wide Band FM, Transmission bandwidth of FM Signals, Generation of FM Signals, Demodulation of FM Signals, FM Stereo Multiplexing, Introduction to Phase–Locked loop. Super heterodyne Receiver</p>	12
Unit - III	<p>DIGITAL REPRESENTATION OF ANALOG SIGNALS:</p> <p>Introduction, Why Digitize Analog Sources?, The Sampling Process, frequency Division multiplexing. Pulse Amplitude Modulation, Time Division Multiplexing, Pulse-Position Modulation, Introduction to digital modulation schemes, Line Coding</p>	12

Reference Books

- a. Principles of Communication Systems, Taub & Schilling, TMH.
- b. Modern Digital and Analog Communication Systems, B. P. Lathi, OUP
- c. Communication System, Hykin, Wheeler
- d. Electronic Communication System, Kenndy, TMH
- e. Electronic Principles, 7th Edition by Albert Paul Malvino, (Tata McGraw - Hill Publishing Company Ltd).

DEC-4103: ELECTRONIC DEVICES & CIRCUITS

Introduction:

1. To understand operation of semiconductor devices.
2. To understand DC analysis and AC models of semiconductor devices.

Objective:

1. To apply concepts for the design of Regulators and Amplifiers.
2. To verify the theoretical concepts through laboratory and simulation experiments.

Credits: 3

Semester IV

L-T-P: 3-0-0

Module No.	Contents	Teaching Hours
Unit -I	<p>Small Signal Amplifier: Approximate hybrid model for Common Emitter Amplifier. Analysis of CE single stage Small Signal Amplifier (with un-bypassed & bypassed emitter resistor), using approximate hybrid equivalent circuit (amplifier input, output impedance, current & voltage gain).</p> <p>POWER AMPLIFIER: Characteristics of Class A, Class B, Class C and Class AB amplifier. Difference between Voltage and Power Amplifier. Transformer coupled Class A Power Amplifier: Circuit operation – Calculation of power, efficiency & distortion. Class B Push Pull Amplifier: Circuit operation – Calculation of power, efficiency & distortion – Crossover distortion – Advantages and</p>	12
Unit - II	<p>FEEDBACK AMPLIFIER: Basic idea of positive and negative feedback – Effect of negative feedback on gain, gain stability, distortion, noise, bandwidth, phase shift, input and output impedances. Voltage and current, series and shunt feedback. Performance of emitter follower circuit – Calculation of gain and input & output impedances – Darlington pair.</p>	12
Unit - III	<p>OSCILLATORS: Concept of oscillation – Barkhausen criteria. Operation of following sinusoidal oscillators: a) tuned collector, b) Hartley, c) Colpitt, d) Wein-bridge, e) Phase Shift, and, f) Crystal.</p> <p>Introduction of 555 timer and OP-AMP IC's with their applications.</p>	12

References:

1. Bhargava, Kulshreshtha & Gupta - "Baisc Electronics & Linear Circuits" - TMH.
2. Malvino, A. P. - "Electrinics Principles" - Tata Mcgraw-Hill.
3. Sedra, Adel S. Smith, Kenneth. C. " Micro Electronics Circuits" - Oxford University Press 5th Edtion

Outcome:

1. Analyze dc circuits and relate ac models of semiconductor devices with their physical Operation,
2. Apply time and frequency concepts of analysis.

DEC-4105: MICROPROCESSOR

Credits: 3

Semester IV

L-T-P: 3-0-0

Module No.	Contents	Teaching Hours
Unit –I	<p>INTRODUCTION TO MICROPROCESSOR: Generation and evolution of microprocessors. Basic Architecture of 8-Bit Microprocessor. Tristate register and switch.</p> <p>ARCHITECTURE OF INTEL-8085: registers, timing and control, add buffer and data buffer, interrupts control, serial input and output control, Pin out configuration Demultiplexing and buffering the system bus.</p> <p>TIMING CYCLE OF 8085: Machine cycle, instruction cycle, Instruction fetch cycle, read cycle and write cycle, Bus idle cycle, Hold and Halt state.</p>	12
Unit – II	<p>PROGRAMMING OF 8085: Software model of 8085A, Addressing modes of 8085A. Classification of instruction and Instruction set of 8085A, Concept of assembly language programming- basic assembler directives and labels.</p> <p>MEMORY INTERFACING : Generalized internal structure of memory device. Basic bus interface. Address space provided by 8085A, Address decoding. Interfacing ROM, static RAM and dynamic RAM</p>	12
Unit – III	<p>I / O INTERFACING AND DATA TRANSFER: Interfacing I/O devices, Address decoding, Isolated I/O versus memory mapped I/O. Synchronous and asynchronous data transfer. Interrupt driven data transfer, single interrupt, multiple interrupt-polling, priority interrupt controller, daisy chaining. Interrupts in 8085A – Software and hard ware – Vectored. Enabling, disabling and masking of interrupts. Direct memory access.</p> <p>I / O INTERFACING DEVICES: Functional block diagram and programming of : — a) 8253(programmable counter), b) 8255(PPI), Functional block description and control word development of :— a) 8259 (programmable interrupt controller), b) Introduction of 8086, difference between 8086 and 8085.</p>	12

References

- 1) Microprocessors Architectures and Applications / Gaonkar / New Age International
- 1) Introduction to microprocessors / A. P. Mathur / Tata McGraw-Hill
 - 2) Microprocessors: Principles and Applications / A. K. Pal / Tata McGraw-Hill
 - 3) Microprocessors Principle and Applications / C. M. Gilmore / Tata McGraw-Hill
 - 4) Microprocessors and its applications / Leventhal

DEC-4081: PCB DESIGN LAB

Credits: 2

Semester IV

L-T-P: 0-0-4

List of Practical

Module No.	Contents	Teaching Hours
1	Study of Single layer and double layer PCB manufacturing process.	48
2	Development of Single layer PCB for common circuits like rectifier, amplifier etc.	
3	To make a layout diagram/ artwork of Op-Amp based Simple circuit /BJT as a switch	
4	To study the process of transferring of Artwork on Cu-cladded sheet i.e. printing.	
5	To perform the etching operation of printed cu-cladded sheet.	
6	To perform drilling operation of PCB.	
7	To study the mounting of component on the PCB and its soldering.	
8	Testing of fabricated PCB for its function.	

List of experiments for advance learners:

1. To design and winding of step down transformer for given parameters.

DEC-4182: PRINCIPLE OF COMMUNICATION LAB.

Credits: 2

Semester IV

L-T-P: 0-0-2

List of Practical

Module No.	Contents	Teaching Hours
1	Realization of amplitude modulation using transistors and determine its modulation Index.	24
2	Realization of envelope detector for demodulation of AM wave and observe diagonal peak clipping effect.	
3		
4	Realization of frequency modulation & demodulation. Find its modulation index.	
5	Realization of DSB-SC modulation and demodulation.	
6	Realization of SSB modulation and demodulation.	
7	Realization of pulse amplitude modulation and demodulation.	
8	Realization of pulse width modulation and emodulation.	
9	Measurement of characteristic impedance of transmission line.	
	Measurement of selectivity, sensitivity and fidelity of super heterodyne receiver.	

List of experiments for advance learners:

1. Plot the radiation pattern of Yagi-Uda antenna and find its beam width.
2. Plot the radiation pattern of micro strip antenna and find its beam width.

DEC-4083: EDC LAB.

Credits: 2

Semester IV

L-T-P: 0-0-4

List of Practical

Module No.	Contents	Teaching Hours
1	.To measure (a) voltage gain (b) input and output impedance for an emitter follower circuit.	48
2	To study the effect of coupling capacitor on lower cut off frequency and upper cut off frequency by plotting frequency response curve of a single stage RC coupled amplifier.	
3		
4	Clipping of both portion of sine-wave using: diode and DC source & zener diodes.	
5	Clamping a sine-wave to: a) Negative dc voltage b) positive voltage.	
6	To measure frequency generation in R-C Phase Shift oscillator.	
7	To measure frequency generation in Hartley and colpitt oscillator.	
8	To generate square-wave using an astable multivibrator and to observe the wave form on a CRO using 555 timer IC.	
9	To observe triggering and working of a monostable multivibrator circuit and observe its output wave form on a CRO using 555 timer IC	
10	To use the op-Amp (IC 741) as inverting one and non-inverting amplifiers.	
11	To use the op-Amp (IC 741) as adder and subtractor.	
	To use the op-Amp (IC 741) as integrator and differentiator	

List of experiments for advance learners:

1. Study of frequency generation in R-C Phase Shift oscillator using PSPICE.
2. Study of Clipper and clamper circuit using PSPICE.
3. Simulation of OP-AMP as integrator and Differentiator using TANNER/PSPICE.
4. Study of IC 555 timer using PSPICE.

DEC 4084 – MICROPROCESSOR LAB

Credits: 2

Semester IV

L-T-P: 0-0-4

List of Practical

Module No.	Contents	Teaching Hours
1	To Study of 8085 Microprocessor Kit.	48
2	To Study of 8086 Microprocessor Kit.	
3	Write a program to add two 8-bit numbers.	
4	Write a program to add two 16-bit numbers.	
5	Write a program to subtract two 8-bit number.	
6	Write a program to subtract two 16-bit number.	
7	Write a program to multiply two 8 bit numbers by repetitive addition	
8	method.	
9	Write a program to divide two 8 bit numbers.	
10	To develop and run a program for finding out the largest from a given set of numbers.	
11	To develop and run a program for finding out the smallest from a given set of numbers.	
12	To develop and run a program for arranging in ascending/descending order of a set of numbers.	
13	To perform computation of square of a given number	

List of experiments for advance learners:

1. Write a program to transfer the block of data from one memory location to other memory location.
2. To perform interfacing of keyboard controller. Interfacing with 8253 to 8085/8086 based system

DEC 4087: MATLAB

Credits: 1

Semester: IV

L-T-P: 0-0-2

Module	Contents	Teaching Hours
I	<ul style="list-style-type: none"> • Introduction to matlab software • Basic operation of matrices. • To Study of different window, sub-window and work in Environment of MATLAB. • Design the model to perform basic arithmetic operation addition, subtraction using To plot To plot the sine wave • Write a program to plot the the multiple sine waves in a single figure window • To study the simulink • To study basic circuits in simulink. • To study different tool box – Communication tool box, Control tool box 	24

GLA UNIVERSITY POLYTECHNIC

COURSE STRUCTURE, CONTACT HOURS and CREDITS

**DISCIPLINE : ELECTRONICS AND COMMUNICATION
ENGINEERING SEMESTER: V SEM (FULL-TIME)-(NO
CHANGE)**

Sr. No.	Subject Code	Subject Name	Periods Per Week			Cr
			L	T	P/D	
1	DEC 5101	Electromagnetic Theory & Antennas	3	0	0	3
2	DEC 5003	Signal And System	3	0	0	3
3		Elective-I	3	0	0	3
4		Elective-II	3	0	0	3
5	DEC 5083	Robotics and Automation Lab	0	0	4	2
6		Elective-II Lab	0	0	4	2
7	DEC 5084	Seminar	0	0	2	1
8	DEC 5098	Project-I	0	0	4	2
9	DEC 5096	Display Devices Repairing and maintenance lab	0	0	4	2
10	DEC 5095	Soft Skill-III	0	0	2	1
TOTAL			12	0	20	22

L- Lecture Period, T-Tutorial Period, P- Practical Period, D- Drawing Practice Period, Cr. - Credit

ELECTIVE-I:

1. DEC 5004- RADAR AND TV
2. DEC 5005- AUDIO AND VIDEO ENG.
3. DEC 5006- EMBEDDED SYSTEM

ELECTIVE-II:

1. DEC 5007- VLSI DESIGN
2. DEC 5008- POWER ELECTRONICS
3. DEC 5109- CONTROL SYSTEM

ELECTIVE- II LAB

1. DEC 5087- VLSI DESIGN LAB
2. DEC 5088- POWER ELECTRONICS LAB
3. DEC 5189- CONTROL SYSTEM LAB

DEC-5101: ELECTROMAGNETIC THEORY & ANTENNAS

INTRODUCTION:

It introduces different quantities associated with electromagnetism as vectors and scalars and also the practical aspects of antennas

OBJECTIVE:

To impart knowledge on the basics of static electric and magnetic field and the associated laws & to give insight into the propagation of EM waves and also to introduce the methods in computational electromagnetic

Credits: 3

Semester V

L-T-P: 3-0-0

Module No.	Contents	Teaching Hours
Unit – I	<p>VECTOR ALGEBRA, COORDINATE SYSTEM & VECTOR CLACULAS: Scalar & vectors, Unit vectors, Vector addition & subtraction, Position vector, Components of Vector. different Coordinate system, Relation in rectangular, cylindrical, spherical coordinate systems. Line, Surface and volume integral, Concept and physical interpretation of gradient, Divergence and curl. Divergence and Stoke's Theorem.</p> <p>ELECTROSTATIC: Electric field intensity & flux density (D). Electric field due to various charge configurations. Gauss's law, divergence of electric flux. Energy density in electrostatic field, Continuity equation and relaxation time,</p>	12
Unit – II	<p>MAGNETOSTATIC: Biot-savart's law, Ampere's Circuit law, Magnetic flux density, , Maxwell's equations for static field, Inductance, Magnetic energy.</p> <p>TIME VARYING FIELDS & RADIATION: Faraday's law, Displacement current, Maxwell's equations in point and integral forms,. Wave propagation in lossy dielectrics, Plane wave in lossless dielectrics, Plane wave in free space, Plane wave in good conductors, Power and the Poynting vector</p>	12
Unit - III	<p>TRANSMISSION LINES: Types of transmission lines: Parallel wire and coaxial cable, Primary and secondary constants of transmission lines. Characteristic impedance – Reflection co-efficient – Standing wave ratio and their relationship.</p> <p>ANTEENAS: Introduction to anteenas.</p>	12

Text Books:-

M.N.O. Sadiku, "Elements of Electromagnetics", 4th Ed, Oxford University Press
Jordan E.C. and Balmain K.G., "Electromagnetic wave and radiating Systems", PHI Second edition.

References:

- 1) W.H. Hayt and J.A. Buck, "Electromagnetic Field Theory", 7th TMH.
- 2) Circuit and networks / Sudhakar / Tata McGraw-Hill
- 3) Kraus, F "Electromagnetics" Tata McGraw Hill fifth edition.
- 4) Antenna for all Applications 3rd edition" Krauss, Marhefka & Ahmed S khan, TMH publication
- 5) Balanis Constantine A, Antenna theory, Analysis and design, 3rd edition, A John Wiley & sons Inc. Publication.

Outcomes:

- Electromagnetic wave propagation in the space.
- Transmission line theory to propagate the em wave.

DEC 5004: RADAR AND TV ENGINEERING

Introduction:

Students will learn to analyze the performance parameters of radio frequency circuits and identify design trade-off of radio frequency communication systems.

Objectives:

To provide students with RF circuit fundamentals for designing key building blocks in a typical RF transceiver.

Credits:3

Semester-V

L- T -P: 3 - 0 -0

Module No.	Contents	Teaching Hours
I	<p>Radar Engineering</p> <p>Introduction: Working Principle of Radar, Radar Frequencies, Radar Equation, Minimum Detectable signal, integration of radar pulses, Pulse repetition frequency and range ambiguities, Applications of Radar.</p> <p>CW And Frequency Modulated (Fm) Radar: Doppler effect, CW Radar, FM-CW radar</p> <p>MTI and Pulse Doppler Radar: Principle And Working, Delay-Line Cancellers</p>	12
II	<p>Tracking Radars: Angular Tracking Systems: Conical Scan and Monopulse, Range and Velocity Tracking Systems, Fundamentals Of Electronic Warfare, Instrument Landing Systems</p>	12

III	<p>Monochrome TV Receivers: Block diagram of TV receiver, Antenna, Balun, R.F Tuner- Block Diagram of VHF and UHF tuners, Video I.F amplifier, Video Detector, Video Amplifier, A.G.C circuits, Sound I.F, Picture tube, Horizontal and Vertical deflection circuits.</p> <p>Colour Television: Colour fundamentals, Mixing of Colour, Chromaticity Diagram, Colour T.V Transmission and Reception.</p>	12
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Reference Books:

1. Skolnik, *“Introduction to Radar Systems”*, Tata McGraw Hill.
2. Peyton Z. Peebles, Jr, *“Radar Principles”*, John Wiley and Sons (2004).
3. Nagaraja, *“Electronic Navigation”*, Tata McGraw Hill.
4. R R Gulati, *“Monochrome and color Television Engineering”*, WileyEastern.
5. Arvind Dhake, *“Television Engineering”*, Tata McGraw Hill.

Outcomes:

They are expected to be able to design key building blocks of RF transceivers, including standard matching circuits, low-noise amplifiers, mixers, power amplifiers and RF oscillators.

DEC 5109 – CONTROL SYSTEM

Introduction:

- To introduce the elements of control system and their modeling using various Techniques.

OBJECTIVES:

- To introduce methods for analyzing the time response, the frequency response and the stability of systems.
- To introduce the state variable analysis method

Credits: 3

Semester V

L-T-P: 3-0-0

Module No.		Teaching Hours
Unit – I	Control system Terminology and classification of control system, examples of control system, mathematical modeling of Mechanical and Electrical systems analogy, differential equations, Feedback characteristics of control systems Feedback and non-feedback systems block diagram representation and reduction, Signal flow graph techniques.	12
Unit – II	Time response analysis Standard test signals, time response of 1st order system, time response of 2nd order system, steady-state errors and error constants, Introduction to effects of additions of poles and zeros to open loop and closed loop system. Time domain stability analysis Concept of stability of linear systems, effects of location of poles on stability, necessary conditions for stability, Routh-Hurwitz stability criteria.	12
Unit - III	Frequency response analysis Correlation between time and frequency response, Polar plots, Bode Plots, and minimum-phase systems, Frequency domain stability analysis Nyquist stability criterion, Introduction to relative stability using Nyquist Criterion (phase margin, gain margin and stability), closed-loop frequency response.	12

Text book:

- I. J. Nagrath & M. Gopal, "Control System Engineering", New Age International Publishers

References books:

- B.C. Kuo & Farid Golnaraghi, "Automatic Control Systems", 8th Edition, John Wiley India, 2008.
- William A. Wolovich, "Automatic Control Systems", Oxford University Press, 2010.
- Joseph J. Distefano III, Allen R. Stubberud, Ivan J. Williams, "Control Systems" Schaums Outlines Series, 3rd Edition, Tata McGraw Hill, Special Indian Edition 2010.

OUTCOMES:

- Perform time domain and frequency domain analysis of control systems required for stability analysis.
- Design the compensation technique that can be used to stabilize control systems

DEC: 5083 ROBOTICS AND AUTOMATION LAB

Credits: 2

Semester V

L-T-P: 0-0-4

S.No.	Contents	Teaching Hours
<ol style="list-style-type: none"> 1. Study of ardino kit. 2. Write the program of blinkig the LED with 5s result come on 13s 3. Write the programm of blinking the LED with different timing 4. Write the program of controlling the stepper motor 5. Write the program of controlling the dc motor with 100 ohm resistance 6. Build the program of Home Automation by using blue thooth device 7. Build the ldder program of automatic door lock by using password 8. Build the line follower robot by using aurdino kit 9. Write the program of controlling relay sheild from bluetooth enable device 10. (aurdino APK) 11. To measure heart beat per minnut 12. Wrote the programming of objective of detective pin 13 will go (on board LED on) and object detected message will be delayed in serial monitor 13. Assignment on introduction to robot configuration demonstration of robot with 2 dof, 3 dof. 14. Two assignments on programming the robot for applications 15. Two programming exercises for robots 16. Two case studies of applications in industry 17. Exercise on robotic simulation software 	48	

DEC 5189: CONTROL SYSTEM LAB

Credits: 02

Semester V

L–T–P: 0–0–4

Module No.	Content	Teaching Hours
I	<ul style="list-style-type: none"> • Introduction to MATLAB (Control System Toolbox), Implement at least two experiments in MATLAB. • Determine transpose, inverse values of given matrix. • Plot the pole-zero configuration in s-plane for the given transfer function. • Determine the transfer function for given closed loop system in block diagram representation. • Plot unit step response of given transfer function and find peak overshoot, peak time. • Plot unit step response and to find rise time and delaytime. • Plot locus of given transfer function, locate closed loop poles for different values of k. • Plot bode plot of given transfer function. • Plot bode plot of given transfer function and find gain and phase margins • Plot Nyquist plot for given transfer function and to compare their relative stability • Plot the Nyquist plot for given transfer function and to discuss closed loop stability, gain and phase margin. 	48

DEC-5096: Display Devices Repairing and Maintenance Lab
Credits: 2 **Semester V** **L-T-P: 0-0-4**

Module No.	Contents	Teaching Hours
1	Study of 7 Segment Display i. Internal connection ii. Study of 4026 IC iii. Programming of 7- segment using Aurdino. iv. Outcome of all the above experiments.	72
2	Study of 16 *2 LCD display i. Internal connection. ii. Programming of 16*2 LCD using Aurdino. iii. Outcome of all the above experiments	
3	Study LCD TV. i. Study and Repairing of Power Supply Section. ii. Basic of (Mother Board, Display panel, Input Audio and Video) iii. Detection of basic fault on Mother Board iv. Testing and Repairing Sound System. v. Repairing of audio and video section	
4	Basic study of DTH, DVD and Dish TV etc. i. Testing and Repairing of audio and video section.	
5	Color TV and How it works. i. Basic Information of Color TV and its internal part (Power supply, Vertical and horizontal deflection plates , Color section, Audio Video section, automatic brightness control section, Sound section, CRT section etc)	
6	Repairing of color TV sections i. Power supply ii .Extremely High Voltage (EHT) iii. Vertical and Horizontal deflection iv. Sound section v. Audio and Video vi. Automatic brightness level vii. color and CRT section	

GLA UNIVERSITY POLYTECHNIC

COURSE STRUCTURE, CONTACT HOURS and CREDITS
DISCIPLINE: ELECTRONICS AND COMMUNICATION
ENGINEERING. SEMESTER: VI SEM (FULL-TIME)---(NEW)

Sr. No.	Subject Code	Subject Name	Periods Per Week			Cr
			L	T	P/D	
1	DEC 6101	MICROWAVE ENGINEERING	3	0	0	3
2	DEC 6102	OPTICAL FIBER COMMUNICATION	3	0	0	3
3		ELECTIVE-I	3	0	0	3
4		ELECTIVE-II	3	0	0	3
5	DEC 6183	OPTICAL FIBER COMMUNICATION LAB	0	0	6	3
6	DEC 6281	MICROWAVE ENGINEERING LAB	0	0	4	2
7	DEC 6098	PROJECT-II	0	0	4	2
8		ELECTIVE-III	0	0	4	2
9	DEC 6095	SOFT SKILL-IV	0	0	2	1
TOTAL			12	0	20	22

ELECTIVE- I:

1. DEC 6004: MECHATRONICS
2. DEC 6009: MODERN CONSUMER

ELECTIVE- II:

1. DEC 6007: WIRELESS AND COGNITIVE SYSTEM
2. DEC 6008: SATELLITE COMMUNICATION
3. DEC 6005 : DATA COMMUNICATION NETWORK

ELECTIVE- III:

4. DEC 6085: DIGITAL SYSTEM DESIGN LAB
5. DEC 6086: DISPLAY DEVICES AND MAINTENANCE LAB-II

DEC-6101: MICROWAVE ENGINEERING

Credits: 03

Semester VI

L-T-P: 3-0-0

Module No.	Contents	Teaching Hours
Unit –I	<p>Rectangular Wave Guide: Wave propagation inside rectangular wave guide, Dominant and degenerate modes, Phase & group velocities, Wave impedances, Power transmission, Power losses in waveguide.</p> <p>Cavity Resonators: Introduction, Rectangular cavity</p>	12
Unit – II	<p>Microwave Components: Scattering matrix, Microwave T-Junctions: E-plane, H-plane and Hybrid Teas, Directional couplers</p> <p>Solid State Microwave Devices: Transferred electron devices (Gunn diode), p-i-n diode, SBD, Tunnel diode.</p>	12
Unit - III	<p>Microwave Tubes: Limitation of conventional active devices at microwave frequency, Two cavity klystron, Reflex klystron.</p> <p>Microwave Measurements: General set up of a microwave test bench, Slotted line carriage, VSWR meter, Measurement of frequency and wavelength.</p>	12

References:

1. Samuel Y. Liao, “*Microwave Devices and Circuits*”, 3rd Ed, Pearson Education.
2. Das and S. K. Das, “*Microwave Engineering*”, 2nd Edition, TMH.
3. R.E Collin, “*Foundation for Microwave Engineering*”, 2nd Ed., John Wiley Indi

DEC 6102– OPTICAL FIBER COMMUNICATION

Credits: 03

Semester VI

L-T-P: 3-0-0

Module No.	Contents	Teaching Hours
Unit –I	FUNDAMENTAL OF OPTICS : 1. Nature of Light : 1.1 Electromagnetic nature of light. 1.2 Principle of reflection, refractions, polarization. 1.3 Basic principle of optical communication. 2. Introduction To Optical Fibre: 2.1 Classification of fibre 2.2 Physical structure. 2.3 Transmission loss in optical fiber	12
Unit – II	OPTICAL DEVICE: 1. Optical Sources: 1.1 Direct and indirect band gap semiconductors. 1.2 Internal and external quantum efficiency. 1.3 Principle, characteristics and construction of LED. - Laser action, PN junction laser, Fabry- Perot resonators.	12
Unit - III	1. Detectors: 1.1 Introduction 1.2 Photodiode- Material and types. 1.3 Avalanche Photo Diode (APD), PIN diode. 1.4 Temperature effect on avalanche gain, noise in APD. 1.5 Photo transistor, PIN- FET, Photo darlington. 1.6 Response time, BW, Noise equivalent power, responsivity. 1.7 Spectral response, dark current and quantum efficiency. .	12

RECOMMENDED BOOKS

1. Electronic Devices and Circuit Theory, 9th Edition by Robert Boylestad & Louis Nashelsky, Prentice Hall India Private Limited.

Reference Books:-

2. Electronic Principles, 7th Edition by Albert Paul Malvino, (Tata McGraw - Hill Publishing Company Ltd).
3. Electronic Devices and Circuits, 5th Edition by David Bell, Oxford University Press.
4. Basic Electronics and Linear Circuits, 4th Edition by Bhargava, Kulshrestha and Gupta (Tata McGraw - Hill Publishing Company Limited)

DEC 6004: MECHATRONICS

Credits: 03

Semester VI

L-T-P: 3-0-0

Introduction: The integration of electronics engineering, electrical engineering, computer technology, and intelligent control engineering with mechanical engineering is increasingly forming a crucial part in the design, manufacture and maintenance of wide range of engineering products and processes as a consequence there is a need for a diploma engineers to understand systems used in automation.

Objective: As industry moves towards higher level of technology integration, technologist with multi-disciplinary knowledge and skills will be in great demand

Module No.	Contents	Teaching Hours
Unit – I	INTRODUCTION TO MECHATRONICS: Definition and evolution level of mechatronics, advantages & disadvantages , features, applications, Scope of mechatronics in industrial sector, Role of various engineering disciplines in mechatronics, components of a mechatronics system, examples of mechatronics system.	12
Unit – II	ACTUATORS-MECHANICAL, ELECTRICAL, HYDRAULIC: Introductopn to mechanical actuators, gear drive, belt drive, chain drive, bearing and its classification. Introduction to electrical actuators, D.C. motors, Single phase motors, Three phase induction motor, selection of a motor for mechatronics applications Introduction to hydraulics actuators and compressors, hydraulic valves Introduction to pneumatic actuators, components, pneumatic valves.	12
Unit – III	Robotics: laws of robotics, Basic Configuration of robotics and its working, programming, Applications of robotics PLC: Basic concepts of PLC, advantages, Parts of PLC, Artificial Intelligence: Basic Concepts of Artificial Intelligence, Configuration of Artificial Intelligence, Fundamental of machine learning, fundamental of neural network, Basics of python programming.	12

Outcome:

1. Knowledge about different neural networks, their architecture and training algorithm
2. Concept of Fuzzy logic, Fuzzy Sets, fuzzy rules and fuzzy reasoning

DEC 6005--: DATA COMMUNICATION NETWORK

Introduces:

It introduces basic IEEE models and introduction to the working of various layers of reference models.

Objectives:

- Understand the division of network functionalities into layers.
- Be familiar with the components required to build different types of networks.
- Be exposed to the required functionality at each layer. Learn the flow control and congestion control algorithms

Credits: 03

Semester VI

L-T-P: 3-0-0

Module No.	Contents	Teaching Hours
Unit –I	Data Communications : Components, protocols and standards, Network and Protocol Architecture, Reference Model ISO-OSI, TCP/IP-Overview ,topology, transmission mode, digital signals, digital to digital encoding, digital data transmission, DTE-DCE interface, interface standards, modems, cable modem, transmission media guided and unguided, transmission impairment, Performance, wavelength and Shannon capacity. Review of Error Detection and Correction codes. Switching: Circuit switching (space-division, time division and space-time division), packet switching (virtual circuit and Datagram approach), message switching.	12
Unit – II	Data Link Layer: Design issues, Data Link Control and Protocols: Flow and Error Control, Stop-and-wait ARQ. Sliding window protocol, Go-Back-N ARQ, Selective Repeat ARQ, HDLC, Point-to –Point Access: PPP Point –to-Point Protocol, PPP Stack, Medium Access Sub layer: Channel allocation problem, Controlled Access, Channelization, multiple access protocols, IEEE standard 802.3 & 802.11 for LANS and WLAN, high-speed LANs, Token ring, Token Bus, FDDI based LAN, Network Devices-repeaters, hubs, switches bridges.	12

<p>Unit - III</p>	<p>Network Layer: Design issues, Routing algorithms, Congestion control algorithms, Host to Host Delivery: Internetworking, addressing and routing, IP addressing (class full & Classless), Subnet, Network Layer Protocols: IPV4, IPV6 .</p> <p>Transport Layer: Process to Process Delivery: UDP; TCP, congestion control and Quality of service. Application Layer: Client Server Model, Socket Interface, Domain Name System (DNS): Electronic Mail (SMTP), file transfer (FTP), HTTP and WWW.</p>	<p>12</p>
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Text Books:

1. A. S. Tannenbum, D. Wetherall, “Computer Networks”, Prentice Hall, Pearson, 5 th Ed
2. Behrouz A. Forouzan, “Data Communications and Networking”, Tata McGraw-Hill, 4th Ed

Reference Books:

- [R1] Fred Halsall, “Computer Networks”, Addison – Wesley Pub. Co. 1996.
2. Larry L, Peterson and Bruce S. Davie, “Computer Networks: A system Approach”, Elsevier, 4 th Ed

Outcomes:

- Identify the components required to build different types of networks.
- Choose the required functionality at each layer for given application.
- Identify solution for each functionality at each layer.
- Trace the flow of information from one node to another node in the network.

DEC 6281: MICROWAVE ENGINEERING LAB

Credits: 2

Semester VI

L-T-P: 0-0-4

- To study the characteristics and applications of microwave frequency bands, propagation of E.M wave through waveguides, and understand the working of various microwave passive and active devices and circuits.

List of Experiments

Part – A: Microwave Test Bench Based (Any 6 Experiments):

1. Study of Reflex Klystron Characteristics.
2. Measurement of guide wavelength and frequency of the signal in a rectangular waveguide using slotted line carriage in a Microwave Bench.
3. Measurement of isolation coefficient, insertion loss and cross coupling of a circulator.
4. Determine the S-parameter of any three port Tee.
5. Determine the S-parameter of a Magic Tee.
6. Determine coupling coefficient, Insertion loss, Directivity and Isolation coefficient of any Multi-Hole directional coupler.
7. Study of waveguide horn and its radiation pattern and determination of the beam width.

Part – B: Mini project using Keysight Advanced Design system:

1. **Microwave Passive components Design** such as Microwave Discrete and Microstrip Filter Design, Discrete and Microstrip Coupler Design, Microstrip and CPW Power Divider Design
2. **Microwave Active components Design** such as Microwave Amplifier Design, Frequency Multiplier Design, Active Mixer Design, Microwave Oscillator Design, Power Amplifier Design

Course Outcomes

1. Measure the performance of simple microwave circuits and devices.
2. Perform microwave measurements of cut-off frequency and wavelength.
3. Analyze the radiation pattern of horn antenna.

Understand the ADS for microwave devices.

DEC 6183: Optical fiber Communication

Credits: 03

Semester VI

L-T-P: 0-0-6

Module No.	Content	Teaching Hours
I	1. Voice transmission through optical link. 2. AM system using analog & Digital Input Signals. 3. Frequency Modulation System. 4. Pulse Width Modulation system. 5. Study of Propagation Loss in optical fiber System. 6. Study of Bending Loss. 7. Measurement of Numerical Aperature. 8. Characteristics of E-O Converter (LED) 9. Fiber optic digital link. 10. PC to PC communication Link using optical fiber.	24

DEC-6086: Display Devices Repairing and Maintenance-II

Credits: 2

Semester VI

L-T-P: 0-0-4

Module No.	Contents	Teaching Hours
I	<ul style="list-style-type: none"> • Maintenance of DTH, DVD and Dish TV etc. Testing and Repairing of audio and video. • CCTV installation and repairing • Making different types of LAN cable with their colour code. • Router configuration. • Study of components of a mother board. • Woofer and sound system repairing(making and repairing) • Induction, iron and heater repair and maintenance. • Stabilizer and single phase inverter repairing and maintenance. • Aurdino based projects. <ul style="list-style-type: none"> i. Digital clock using 16*2 LCD ii. Home automation using Bluetooth. 	48

