MAHATMA GANDHI UNIVERSITY, KERALA

Abstract

Bachelor of Science (Honours) Electronics with Computer Technology - Fourth Semester - Modifications to the Course Outcomes, Course Content, Mode of Assessment and Removal of a Course - Approved - Orders Issued.

ACA 16

No. 11127/ACA 16/2025/MGU Priyadarsini Hills,Dated: 25.11.2025

Read:-1. U.O.No.5797/AC A16/2024/MGU, dated.27.06.2024.

2. Minutes of the meeting of the Expert Committee on Electronics (UG).

3. Orders of the Professor in charge of the Vice Chancellor under Section 10(17), Chapter III of the Mahatma Gandhi University Act 1985, dated. 18.11.2025.

ORDER

The syllabi of various Honours Under Graduate Programmes coming under The MGU-UGP (Honours) Regulations, 2024, have been approved vide paper read as (1) above and published on the website of the University.

The Expert Committee on Electronics (UG), discussed the need to modify the Course Details, Course Outcomes, Course Content and Mode of Assessment of DSC/DSE/SEC type courses. Also recommended to include Programme Title in the detailed syllabus page of SEC/VAC type courses, to rectify the typographical errors in the Course Code in the detailed syllabus page of the course MG4DSEECT204: Robotics. Also to rectify the Course Name of the course MG4DSEECT205: Continuous and Discrete Systems, in the Index Page and Total Marks for ESE of the VAC type course. Also recommended to remove the course MG4SECECT203: User Interface and User Experience for App Development, from the syllabus and to modify the References and Suggested Readings of the DSE type courses in the Fourth Semester syllabus of **Bachelor of Science (Honours) Electronics with Computer Technology programme** and has submitted recommendations vide paper read as (2) above.

(Recommendations are attached as Annexure)

Considering the urgency, sanction has been accorded by the Professor in charge of the Vice Chancellor, in exercise of the powers of the Academic Council vested upon him under Section 10(17), Chapter III of the Mahatma Gandhi University Act 1985, vide paper read as (3) above, to approve the said recommendations.

Hence, the Course Name, Course Code, Course Details, Course Outcomes, Course Content and Mode of Assessment of the said courses in the Fourth semester syllabus of **Bachelor of Science (Honours) Electronics with Computer Technology** programme stands modified to this extent.

Orders are issued accordingly.

SUDHA MENON J

ASSISTANT REGISTRAR III
(ACADEMIC)
For REGISTRAR

Copy To

1. PS to VC
2. PA to Registrar/CE
3. Convenor, Expert Committee, Electronics (UG)
4. JR 2 (Admin)/DR 2, AR 3 (Academic)
5. JR/DR/AR (Exam)
6. Tabulation/Academic Sections concerned
7. AC C1/AC C2 Sections
8. IT Cell 3/OQPM1 Sections
9. PRO/IQAC/Records Sections
10. Stock File/File Copy

File No. 109936/AC A16-3 /2025/ACA 16

Forwarded / By Order

Section Officer

Annexure

SEMESTER IV
Index Page

Course Code	Title of the Course (Modified)	Type of Course DSC, MDC, SEC etc.	Credit	Hours / week	Hour Distribution/ week				Page No.
					L	T	P	O	
MG4DSEECT205	Continuous and Discrete Systems (Electronic systems and Programming Specialization) (For Physics Major Only) **(Typograghical Error Corrected)**	No Change							9
MG4SECECT203	User Interface and User Experience for App Development- **Course Removed**								

Course Name: Python Programming
Course Code : MG4DSCECT200

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome (Modified)	Learning Domains	PO No.	Page No.
3	Understand the fundamentals of exception handling and apply to build robust and error resilient programs	No Change		86

COURSE CONTENT
Content for Classroom Transaction (Units)

Module	Units	Course Description (Modified)	Hrs	CO No.	Page No.
3	3.1	**Packages and Data Visualization:** Packages in Python, importing modules from a package. Python Libraries: Importing Libraries Basic concepts in data visualization, Basic charts – Bar chart, Pie chart, line graph, Scatter plot and histogram, Packages and library functions for data	No Change		87

		visualization (matplotlib/seaborn/Pandas)		
	3.2	No Change		
	3.3			
	3.4			
4		**Python Programming Lab:** 1. Programs based on data types, Input & Output and Control Statements 2. Programs based on Arrays 3. Programs based on Strings 4. Programs based on Functions 5. Programs based on Lists and Tuples 6. Programs based on Dictionaries 7. Programs to demonstrate basic plots using matplotlib 8. Programs based on Exception handling 9. Programs based on Regular Expressions 10. Make a login form with tkinter	No Change	
5	Teacher Specific Content			

Course Name: IOT System Design
Course Code : MG4DSCECT202

Course Details (Modified)	Lecture	Tutorial	Practical	Others	Page No : 92
	3		1		

COURSE CONTENT
Content for Classroom Transaction (Units)

Module	Units	Course Description (Modified)	Hrs	CO No.	Page No.
1	1.1	Introduction to embedded system, Building blocks of IoT, Sensors & Actuators, Cloud based monitoring systems	No Change		92
	1.2	Layers of IoT- Perception layer, Network layer, Cloud layer, Application layer			

	1.3	Things in IoT-Sensors and actuators, Application Areas		
	1.4	Familiarization IoT Gadgets in daily life - IP Camera, Smart lamp, Smart FAN, Automated water pump, Home automation and security		
2	2.1	Operation and applications of sensors: IR sensor, LDR sensor, PIR sensor, Ultrasonic sensor, Gas sensor, Gyroscope sensor, Heart beat sensor (concept only), Actuators and examples: hydraulic, pneumatic, magnetic, and mechanical (Concept level only)		
	2.2	IoT supported hardware -ESP32, ESP 8266, Raspberry Pi Zero (specifications and features only)	No Change	
	2.3	Basic Concepts of IoT communication protocols – MQTT (subscribe/publish activity), CoAP, XMPP, DDS		
	2.4	IoT platforms- Blynk, ThingSpeak, Arduino cloud, FireBase		
3	3.1	IoT classification-Consumer, Industrial, Commercial IoT, Agri IoT, medical IoT		
	3.2	Applications - Home automation, Smart cities, smart power grid, logistics & transportation, agriculture, health and life style, Industry 2.0		
	3.3	Challenges -Legal challenges, privacy issues, design ethics, environmental issues.		93
	3.4	AI in IoT-Automated vehicles, Drone delivery system, smart wearable gadgets		
4	4.1	**IoT System Design (Practical) (14 experiment out of 20)** 1. Familiarization of development board ESP8266 and Arduino IDE 2. Blinking of a LED 3. Control LED using button switch 4. PIR sensor interfacing & alert using Blynk 5. Ultrasonic sensor interfacing 6. Obstacle/infrared sensor interfacing and alert using Blynk 7. LM35 interfacing: Read temperature and display the measurement in serial monitor 8. Interface DHT11 sensor and display the output in serial monitor 9. Soil moisture sensor interfacing 10. Rain drop sensor interfacing		

		11. Servo motor with blynk control 12. Generate PWM signal and observe the output in a CRO 13. Brightness control of LED using PWM 14. DC motor interfacing with blynk 15. LCD display interfacing 16. LM35 interfacing with IoT (Blynk): Read temperature and display on Blynk dashboard 17. DHT11 sensor interfacing with IoT (Blynk): Display humidity and temperature on Blynk app 18. Soil moisture sensor interfacing with IoT (Blynk): Monitor soil condition remotely 19. Rain drop sensor interfacing with IoT (Blynk): Display rain status on mobile app 20. IoT-based Home appliances control using relay and Blynk app **One experiment, 21/22, is mandatory:** 21. LED/Device control using Blynk server/app 22. LED/Device control using ThingSpeak		
5	Teacher Specific Content			

Course Name: ARM Based Embedded Systems
Course Code : MG4DSEECT200

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains (Modified)	PO No.	Page No.
1	No Change	K	No Change	95
2		No Change		
3				
4		A		

COURSE CONTENT
Content for Classroom Transaction (Units)

Module	Units	Course Description (Modified)	Hrs	CO No.	Page No.
4		Hands on session (Minimum: 8) - Interfacing with ARM Cortex M GPIO Control- 1. LED ON–OFF Control 2. LED Blinking Using Delay 3. LED Blinking Using External Interrupt 4. Switch Control of LED 5. Create running light 6. Interface with Temperature Sensor (LM35 / NTC) 7. IR Sensor Interface 8. Buzzer and LED Alert System 9. Traffic Light Controller 10. Relay Control – Drive a relay using a transistor interface 11. Seven Segment Display Interface The session should involve writing code in Keil 5 or Arduino IDE with ARM library and simulating the circuits in Proteus Simulator for simulation-based experiments. For hardware-based session deploy the code onto the actual ARM boards (Cortex M3, ARM 7, STM 32)	No Change		96
5	Teacher Specific Content				

MODE OF ASSESSMENT

B. End Semester Evaluation (ESE) (Modified)

1.Theory			
Max.Marks: 70			**Duration: 2 Hrs.**
Type of Questions	**Number of Questions to be answered**	**Marks**	**Page No**
MCQ	16 out of 16	16 x 1 = 16	97

Short Answer	6 out of 8	6 x 5 = 30	
Essay	2 out of 4	2 x 12 = 24	

Suggested Reading (Modified)

1 Valvano, Jonathan W. Embedded systems: introduction to ARM® Cortex (TM)-M microcontrollers. Jonathan W. Valvano, 2014. 2 Mazidi, Muhammad Ali, et al. Freescale ARM Cortex-M Embedded Programming(Volume 3),MicroDigitalEd. com, 2016. 3 Abhilash Pandiankal, Introduction to ARM System ISBN-13979-**8326652256, Kindle Edition by https://amzn.in/d/6NKRvNW**	**Page No:** 97

Course Name: 3D Printing and its Applications

Course Code : MG4DSEECT201

MODE OF ASSESSMENT

B. End Semester Evaluation (ESE) (Modified)

1.Theory			
Max.Marks: 70			**Duration: 2 Hrs.**
Type of Questions	**Number of Questions to be answered**	**Marks**	**Page No**
MCQ	16 out of 16	16 x 1 = 16	99
Short Answer	6 out of 8	6 x 5 = 30	
Essay	2 out of 4	2 x 12 = 24	

Course Name: Data Science for AI

Course Code : MG4DSEECT202

MODE OF ASSESSMENT

B. End Semester Evaluation (ESE) (Modified)

1.Theory			
Max.Marks: 70			**Duration: 2 Hrs.**
Type of Questions	**Number of Questions to be answered**	**Marks**	**Page No**
MCQ	16 out of 16	16 x 1 = 16	102
Short Answer	6 out of 8	6 x 5 = 30	

Essay	2 out of 4	2 x 12 = 24	

Course Name: Single Board Computers for IoT Applications
Course Code : MG4DSEECT203

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome (Modified)	Learning Domains (Modified)	PO No.	Page No.
1	Understand the architecture and programming of Arduino Uno, ESP 8266	No Change	No Change	103
2	Develop expertise in Raspberry Pi interfacing	U		
3	Explore single board computers and its real-world IoT applications	U		
4	No change	A		

COURSE CONTENT
Content for Classroom Transaction (Units)

Module	Units	Course Description (Modified)	Hrs (Modified)	CO No.	Page No.
1	1.1	Types of Arduino boards (Uno, Nano, Mini, Mega) and pin configuration of Arduino uno, Installation of Arduino IDE and essential drivers, Programming using Embedded C.	No Change		103
	1.2	Interfacing of Arduino Uno - turning ON LED using push button. Data collection from Sensors (IR Sensor, LDR, Ultrasonic Sensor)			
	1.3	Introduction to IoT, Basic building blocks, Cloud Services (Blynk/Arduino Cloud/Thing Speak)			
	1.4	ESP8266 Module, Connection with IoT Cloud Platforms. Widgets and Dashboard Creation using Cloud Platforms			
2	2.1	Raspberry Pi Overview – Models, Port and Pin Configuration, On-board Components - processor,			

		RAM, SD card slot, Socket			
	2.2	Raspbian OS-Installation Steps			
	2.3	Basic Programming with Python on Raspberry Pi - printing a string, basic calculator, making simple expressions (area, volume, heat conversion)			
	2.4	GPIO Control using Python – LED Toggling, Push Button Interfacing, Integration of Raspberry Pi with IoT platforms – ThingSpeak			
3	3.1	Installation of open CV and camera interfacing			
	3.2	Advanced Hardware Tools – Tinkerboard, BeagleBone, Banana Pi: Features and Applications			
	3.3	NVIDIA Jetson Nano: Features and Applications			
	3.4	Raspberry Pi Applications – Home Automation, Security Systems, Real- Time Sensor Monitoring			
4	4.1	Blinking of LED with micropython Using Raspberry Pi/Arduino/ESP8266 (Either hardware or simulator)	15	No Change	104
	4.2	Creating Traffic light using Raspberry Pi/Arduino/ESP8266 (Using hardware or simulator)			
	4.3	Buzzer interfacing Using Raspberry Pi/Arduino/ESP8266 (Either hardware or simulator)			
	4.4	Installation of essential software package- office tools, Arduino IDE, Image editor(any one)			
5	Teacher Specific Content				

MODE OF ASSESSMENT

B. End Semester Evaluation (ESE) (Modified)

1.Theory			
Max.Marks: 70			**Duration: 2 Hrs.**
Type of Questions	**Number of Questions to be answered**	**Marks**	**Page No**
MCQ	16 out of 16	16 x 1 = 16	104
Short Answer	6 out of 8	6 x 5 = 30	
Essay	2 out of 4	2 x 12 = 24	

References (Modified)

1. Mike Cheich, Arduino Book for Beginners, Programming Electronics Academy, 2020. 2. Simon Monk, Raspberry Pi Cookbook, 4th Edition, O'Reilly Media Inc., 2022. 3. Liz Clark, Practical Tinker Board: Getting Started and Building Projects with the ASUS Single-Board Computer, Apress, 2020.	**Page No.** 104

Suggested Reading (Modified)

1	Marco Schwartz, Internet of Things with Arduino Cookbook, Packt Publishing, 2016.	**Page No:** 104
2	Ashwin Pajankar, Internet of Things with Arduino & Bolt, BPB Publications, 2019.	
3	Derek Molloy, Exploring BeagleBone – Tools and Techniques for Building with Embedded Linux, 2nd Edition, Wiley, 2019.	
4	Yogesh Chavan, Programming the BeagleBone, BPB Publications, 2021.	
5	Agus Kurniawan, IoT Projects with NVIDIA Jetson Nano: AI-Enabled Internet of Things Projects for Beginners, Apress, 2021.	

Course Name: Robotics

Course Code (Modified)	**MG4DSEECT204**	**Page No.** 105

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome (Modified)	Learning Domains (Modified)	PO No.	Page No.
1	Explain the characteristics, and classification of robots and their applications	No Change	No Change	105
2	Describe the working principles of robot motion, degree of freedom, and actuation mechanisms	U, A		
3	Illustrate the robot design process, role of sensors, and basic control systems	No Change		

4	Evaluate the impact of robotics in industry and society, considering ethics and future trends	An		

COURSE CONTENT
Content for Classroom Transaction (Units)

Module	Units (Modified)	Course Description (Modified)	Hrs (Modified)	CO No. (Modified)	Page No.
1	1.1	Basics of Robotics- definition, history, evolution and characteristics of robotic system	2	No Change	105
	1.2	Importance of robotics, difference between robots, machines, and automation, Early robotic systems and major milestones, Generations of robots and technological growth	2		
	1.3	Components of a Robotic system, Structure: manipulator, joints, end effector, controller, sensors Overview of hardware and software components	3		
	1.4	Classification of Robots - Based on structure: articulated, SCARA, cylindrical, Cartesian Based on application: industrial, service, medical, humanoid	No Change		
2	2.1	Types of Robots: Industrial robots, mobile robots, humanoid robots, collaborative robots Concept of self-healing robots and its applications	4		106
	2.2	Work space, Degrees of Freedom & Kinematics, Concept of DOF, joints, links, Basic principles of motion, selection of robot based on workspace	5		
	2.3	Locomotion Systems, Wheeled, legged, tracked, and aerial robots Advantages and limitations of each locomotion type	4		
	2.4	Actuators and Motion Control Basics of actuators: electrical - servo motors, DC motor, stepper motor, linear motor, hydraulic & pneumatic systems, Introduction to path planning	No Change		
3	3.1	Design Process of Robots: Conceptual design, modelling, prototyping, testing, implementation	No Change		
	3.2	Sensors and Perception: Role of sensors in	6		

		robots, Types: IR proximity, computer vision, ultrasonic, touch sensors. Environmental sensors – light, temperature, humidity and flammable gas sensors.			
	3.3	Control System basics, Overview of feedback and control loops, Types of control systems in robotics, On-Off Control systems (basic concepts)	5		
	3.4	Software and Programming Concepts Role of software in robotics, Overview of common robotics programming platforms (conceptual, no coding)	6		
4	4.1	Industrial Applications: Assembly, spot welding, packing, material handling, painting, inspection	3		
	4.2	Service and Medical Robots, Domestic, educational, surgical, rehabilitation robots	2		
	4.3	Advanced Applications: Space exploration, underwater robotics, defense and surveillance	2		
	4.4	Future Trends and Ethical Issues, Human-robot collaboration, AI integration, ethics and safety	3	4	
5	Teacher Specific Content				

MODE OF ASSESSMENT

B. End Semester Evaluation (ESE) (Modified)

1.Theory			
Max.Marks: 70			**Duration: 2 Hrs.**
Type of Questions	**Number of Questions to be answered**	**Marks**	**Page No**
MCQ	16 out of 16	16 x 1 = 16	106
Short Answer	6 out of 8	6 x 5 = 30	
Essay	2 out of 4	2 x 12 = 24	

Course Name: Continuous and Discrete Systems
Course Code : MG4DSEECT205

Course Details (Modified)	Lecture	Tutorial	Practical (Modified)	Others	Page No.
	3		**1**		108

MODE OF ASSESSMENT

B. End Semester Evaluation (ESE) (Modified)

1.Theory			
Max.Marks: 50			**Duration: 1.5 Hrs.**
Type of Questions	**Number of Questions to be answered**	**Marks**	**Page No**
Part A: Short Answer	10 out of 14	10 x 2 = 20	109
Part B: Short Essay	6 out of 8	6 x 5 = 30	

Course Name: Wireless Technology
Course Code : MG4DSCECT203

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome (Modified)	Learning Domains (Modified)	PO No.	Page No.
1	Understand basic RF concepts, spectrum usage, and modulation techniques used in wireless communication	No Change	No Change	111
2	Understand wireless channel effects, signal quality measures, and the characteristics of modern wireless communication systems			
3	Apply RF circuit concepts and wireless communication standards to interpret and simulate basic RF system blocks	A		
4	Apply RF and wireless communication concepts using analog circuits and microcontroller platforms	A		

COURSE CONTENT
Content for Classroom Transaction (Units)

Module	Units	Course Description (Modified)	Hrs	CO No.	Page No.
1	1.1	Introduction to RF Systems: Definition and basic concepts of RF, Components of RF system, Applications of RF in communication, radar, IoT, and wireless devices, Advantages and challenges of RF systems	No Change	No Change	111, 112
	1.2	RF Spectrum and Regulations: RF spectrum overview (frequency ranges and their uses), Spectrum allocation and bands (ISM, cellular, satellite), Need for regulation in RF communication, national and international regulatory bodies (TRAI, FCC, ITU), Licensed and unlicensed bands			
	1.3	Analog Modulation and Demodulation Techniques: Need for modulation Types of modulation-AM, FM, PM (Derivations not required). AM Demodulation			
	1.4	Digital Modulation: Types of modulation- ASK, FSK, PSK, QPSK, QAM (qualitative concepts: constellation diagrams, bandwidth vs data rate trade-off)			
2	2.1	Wireless Communication Channels, Path Loss, Interference, Fading			
	2.2	Power in dB and dBm. Noise & SNR, Impact on digital BER (qualitative only)			
	2.3	Link budget basics and range factors RSSI (Received Signal Strength Indicator) and signal quality assessment			
	2.4	Wireless Communication Systems Cellular Networks, Wi-Fi, Bluetooth, Other Personal Area Networks (PANs)			
3	3.1	RF Components Antennas, Amplifiers, Filters			
	3.2	RF Circuit: Oscillators (Basic Concept, purpose, tank circuit, crystal oscillators) Mixers (Basic Concept, purpose, diode mixer and transistor mixer)			
	3.3	Communication Standards and Protocols Overview of major wireless standards: GSM, LTE, 5G Wi-Fi, Protocols and their applications in			

		wireless communication			
	3.4	Design and Implementation of RF Systems Basics of RF circuit design, Simulation tools and techniques			
4	4.1	**Practicals: Any Eight from 4.1 and 4.2** Use hardware or simulation using LTspice or equivalent. 1 Infrared LED Remote Control Circuit Implementation 2 Resonance Study Using a Colpitts LC Oscillator 3 AM Modulation and Envelope Detection 4 Low-Pass RF Filter Design and Frequency Response Characterization 5 Band-Pass RF Filter Design and Frequency Response characterization 6 **RF Spectrum Observation Using RTL-SDR**			
	4.2	Wireless Experiments Using Microcontrollers (Arduino/NodeMCU/ESP32) 1 Antenna and Range Testing Using NRF24L01 Wireless Module 2 Wi-Fi-Based LED Control Using NodeMCU/ESP32 3 RF Communication Using FS1000A and XY-MK Modules 4 Bluetooth Communication Using HC-05 with Arduino/ESP32 5 Wireless Sensor Data Transmission Using Microcontrollers (Temperature, Humidity or Potentiometer voltage) 6 NFC Card Reading Using PN532 Module 7 Cellular IoT Connectivity Using A7672S 4G LTE Module			
5	Teacher specific content				

MODE OF ASSESSMENT(Modified)

A.Continuous Comprehensive Assessment (CCA)

2.Practical	Page No
Total Marks: 15	112

B. End Semester Evaluation (ESE)

2.Practical	
Total Marks: 35 **Duration: 2 Hrs.**	**Page No** 112,113
a. Viva - 10 Marks b. Lab Report - 10 Marks c. Demonstration - 15 Marks	

Course Name: Computer Organization
Course Code : MG4DSCECT204

COURSE CONTENT
Content for Classroom Transaction (Units)

Module	Units	Course Description	Hrs (Modified)	CO No.	Page No.
1	1.1	No Change	5	No Change	114,115
	1.2		No Change		
	1.3				
2	2.1				
	2.2				
	2.3		4		
5	Teacher Specific Content				

MODE OF ASSESSMENT

B. End Semester Evaluation (ESE) (Modified)

1.Theory

Max.Marks: 50			Duration: 1.5 Hrs.
Type of Questions	**Number of Questions to be answered**	**Marks**	**Page No**
Part A: Very Short Answer	10 out of 10	10 x 1 = 10	116

Part B: Short Answer	4 out of 6	4 x 5 = 20	
Part C: Essay	2 out of 3	2 x 10= 20	

2.Practical

Total Marks: 35	**Duration: 1.5Hrs.**	**Page No**
a. Viva - 10 Marks b. Demonstration - 15 Marks c. Record -10 Marks		116

Course Name: Circuit Simulation and PCB Design
Course Code: MG4SECECT200

Programme	**BSc (Hons) Electronics with Computer Technology**	**Page No :** 117

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome (Modified)	Learning Domains (Modified)	PO No.	Page No.
1	No Change	No Change	No Change	117
2		U		
3	Familiarization of simulation and prototyping software for PCB design	U		
4	Removed			

COURSE CONTENT
Content for Classroom Transaction (Units)

Module	Units	Course Description (Modified)	Hrs	CO No. (Modified)	Page No.
1	1.1	Fundamentals of Printed Circuit Board Design. Types of PCB -Single Sided Boards, Double Sided, multilayer PCB	No Change		117, 118
	1.2	Identification and labelling of components in PCB–			

		Resistor, Capacitor,Inductor, Diode, Transistor and IC		
	1.3	Study of SMD Components, Identification of resistors, capacitors and transistors in Surface Mount PCB		
	1.4	PCB Substrate material selection, layer stack-up, copper cladding		
2	2.1	Basic design rules for PCB design, exporting PCB format – GERBER file generation		
	2.2	Raw PCB preparation for printing – cutting,polishing, surface cleaning, marking of mounting screw position, selection of enclosure		
	2.3	Thermal print transfer, copper etching and solder mask preparation	No change	
	2.4	Drilling and Plating - Through-Hole Drilling, Automated Drilling Machines, Through-Hole Plating		
	2.5	Testing of PCB – continuity test, short and open circuit test, finalizing PCB with protective coating		
3	3.1	Brief introduction of various simulators: EasyEDA, Proteus, ki CAD (Any One) Schematic capturing – Ohm’s law, voltage divider, LED with resistor.		
	3.2	Selection of components in simulation software, custom made footprint, assigning footprint to components, net listing		
	3.3	PCB layout designing, auto routing and manual routing, assigning specific text (silkscreen) to design,generating Bill of Materials (BOM)	No Change	3
	3.4	Exporting different layers of PCB – PDF, GERBER file		3
	3.5	Introduction to soldering,assembling of a simple PCB		3
4	Teacher Specific Content			

Course Name: PCB Design & 3D Printing
Course Code: MG4SECECT201

Course Details (Modified)	Lecture (Modified)	Tutorial	Practical	Others	Page No.
	3				119

COURSE CONTENT
Content for Classroom Transaction (Units)

Module	Units	Course Description	Hrs (Modified)	CO No.	Page No.
3	3.1	No Change	No Change	No Change	120
	3.2		7		
4	Teacher Specific Content				

Course Name: Solar Technology and Applications
Couse Code: MG4SECECT202

Programme	BSc (Hons) Electronics with Computer Technology	Page No : 121

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome (Modified)	Learning Domains (Modified)	PO No.	Page No.
1	Understand the components and working principles of photovoltaic (PV) based power plants	No Change	No Change	121
2	Interpret energy consumption data to estimate power requirements and outline the basic design of a solar power plant	U		
3	Recall common faults in solar power systems and identify appropriate troubleshooting techniques	K		
4	List standard procedures and tools used in the installation and maintenance of a solar power plant	K		

COURSE CONTENT
Content for Classroom Transaction (Units)

Module	Units	Course Description (Modified)	Hrs	CO No.	Page No.
2	2.1	On-grid PV System Configuration, OFF grid PV System Configuration	No Change		121,122
	2.2	PV System Design: Site Assessment, Sizing, Performance Estimation			
	2.3	Hybrid PV System Configuration			
	2.4	Electrical Wiring, Safety Practices, Solar Power Regulations			
3	3.1	Solar PV in Electric Vehicles and Water Pumping Systems			
	3.2	Monitoring, Data Analysis, and Troubleshooting of PV Systems			
	3.3	Emerging Trends - Familiarisation of Organic Photovoltaics (OPVs), Quantum Dot Solar Cells			
	3.4	Case Study Report on Implementation, Maintenance and Performance Analysis			
4	Teacher Specific Content				

Course Name: User Interface and User Experience for App Development

Course Code: MG4SECECT203

Course Removed	**Page No :** 123-125

Course Name: Multimedia Electronics
Course Code: MG4SECECT204

Programme	**BSc (Hons) Electronics with Computer Technology**	**Page No :** 126

Course Name: Environmental Monitoring using Sensors
Course Code: MG4VACECT200

Programme	BSc (Hons) Electronics with Computer Technology	Page No : 128

MODE OF ASSESSMENT

B. End Semester Evaluation (ESE) (Modified)

1.Theory		Page No.129
Max.Marks: 50	Duration: 1.5 Hrs.	