



MAHATMA GANDHI UNIVERSITY, KERALA

Abstract

Bachelor of Science (Honours) Electronics with Computer Technology and Computer Science (Double Major) - Fifth Semester - Modifications to the Course Outcomes, Course Content, Substitution of courses and approval of the syllabi for the same - Approved - Orders Issued.

ACA 16

No. 5396/ACA 16/2026/MGU

Priyadarsini Hills, Dated: 29.05.2026

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. 26.05.2026.

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 Outcomes, Course Content of DSC/DSE type courses. and also recommended to substitute the courses MG5DSECECC300: Computer Assembling and Maintenance, with MG5DSECECC300: Microwave Electronics, and MG5SECECC300: Office Automation and Content Creation, with MG5SECECC300: Responsive Web Design and Frontend Development, (Syllabus link - <https://cap.mgu.ac.in/mguugp/syllabus.jsp>), in the Fifth Semester syllabus of **Bachelor of Science (Honours) Electronics with Computer Technology and Computer Science (Double Major)** 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 Outcomes and Course Content of the said courses in the Fifth Semester syllabus of **Bachelor of Science (Honours) Electronics with Computer Technology and Computer Science (Double Major)** 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. 38356/AC A16-3/2026/ACA 16

Forwarded / By Order

Section Officer

The document is digitally approved. Hence signature is not needed.

Annexure

SEMESTER V

Course Name: Digital Design Using Verilog

Course Code: MG5DSCECC300

COURSE CONTENT

Content for Classroom Transaction (Units)

Module	Units (Modified)		Course Description	Hrs	CO No.	Page No.
1	No Change					
2						
3						
4	Existing	Proposed	No Change			86
	4.1	4.1				
	4.2					
	4.3					
	4.4					
	4.3					
	4.4					
	4.5					
	4.6					
	4.7					
	4.8					
	4.9					
4.10						
4.11						
5	Teacher Specific Content					

MODE OF ASSESSMENT(Typographical Error Rectified)

A.Continuous Comprehensive Assessment (CCA)

1.Theory		Page No 87
Total Marks: 25		
Internal Test – One MCQ based and one extended answer type Seminar Presentation – a real time application of emerging technology to be identified and present it as seminar		

2.Practical		Page No 87
Total Marks: 15		
Components for assessment (suggestions): A combination of quizzes, assignments, Performance, Case Study.		

B. End Semester Evaluation (ESE)

1.Theory			
Max.Marks: 50		Duration: 1.5 Hrs.	
Type of Questions	Number of Questions to be answered	Marks	Page No
MCQ	10 out of 10	10 x 1 = 10	87
Short Answer	4 out of 6	4 x 5 = 20	
Essay	2 out of 4	2 x 10 = 20	

2.Practical (Marks Included)		Page No 87
Total Marks: 35	Duration: 2 Hrs.	
a. Viva -10 Marks		
b. Lab Report - 5 Marks		
c. Demonstration – 20 Marks		

Course Name: Artificial Intelligence and Machine Learning

Course Code: MG5DSCECC301

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains (Modified)	PO No. (Modified)	Page No.
1	No Change	No Change	No Change	88
2			1,2,4,10	
3		A	1,2,4,9,10	
4		A	No Change	

COURSE CONTENT

Content for Classroom Transaction (Units)

Module	Units (Modified)	Course Description (Modified)	Hrs	CO No.	Page No.
1	1.1	Introduction to Artificial Intelligence: Introduction, Definition and Scope. Concept of Rationality	No Change	No Change	89
	1.2	Problem Solving in AI: Problem-Solving, Find Goal and formulate the Goal. Design the problem and Problem Formulation, Steps involved in Problem-Solving, Crucial component of the Problem, Real-Time Problem-Solving Examples			
	1.3	Search Techniques: Searching Methods: Greedy Best-First Search, A* Search Algorithm			
	1.4	Local Search: Introduction to Local Search, Hill Climbing Algorithm, Simulated Annealing, Local Beam Search, Genetic Algorithms			
2	2.1	Adversarial Search and Games: Game Theory Basics, Mini-Max Algorithm, Alpha-Beta Pruning	No Change	No Change	89
	2.2	Logic and logical agents: Knowledge-Based Agents, Logic and Logical Reasoning, Logical Inference Inference Algorithms and Properties, Propositional Logic: Syntax and Semantics			
	2.3	Uncertainty: Concept of Uncertainty, Basics of Probability, Full Joint Inference, Independence, Bayes Theorem and Naïve Bayes, Bayesian Networks (Syntax & Factorization), Inference in Bayesian Networks, Conditional Independence, Markov Blanket, D-Separation,			

		Bayesian Networks (Rejection Sampling, Likelihood Weighting)			
	2.4	Fundamentals of Machine Learning: Definition and Concepts. Types of Machine Learning, Visualization Examples for ML Types, Training, Validation, and Testing Data Sets.			
3	3.1	Data Handling: Definition of Data, Types of Attributes, Discrete and Continuous Attributes, Characteristics of Data, Outliers and Data Quality Problems, Data Pre-processing. Confusion Matrix - Performance Evaluation. Receiver Operating Characteristic (ROC) Curve. Handling Imbalanced Classes. Challenges of Machine Learning	No Change	No Change	
	3.2	Linear Regression Models: Linear Regression, Model Learning Process (Model Engine), Cost Function, Linear vs Nonlinear Functions, Optimization Techniques, L1 and L2 Regularization, Early Stopping			
	3.3	Classification & Supervised Learning Algorithms: Classification: Concepts and Types, Logistic Regression, Binary vs Multi-class Classification Cross Entropy and Cost Optimization. Decision Tree: Construction and Examples, Pruning, Gini Impurity and Entropy, Information Gain, Issues in Decision Trees. Instance-Based Learning: K-Nearest Neighbour (KNN), K Value Selection (Elbow Method), Locally Weighted Regression			
	3.4	Advanced Learning Techniques: Support Vector			

		<p>Machine (SVM): Basics, Maximum Margin Classifier, Linear and Nonlinear Classification.</p> <p>Bayesian Learning: Bayes Theorem, Naïve Bayes Classifier, Maximum Likelihood Estimation</p> <p>Ensemble Learning: Bagging and Boosting, Random Forest Algorithms, AdaBoost Algorithms, Gradient Boosting Algorithms.</p>		
4	<p>4.1 (Unit Number Included)</p>	<p>Practicals:</p> <ol style="list-style-type: none"> 1. Understanding AI & Rational Agents 2. Problem Formulation & Goal-Based Agent 3. Greedy Best-First Search 4. Hill Climbing Algorithm 5. Mini-Max Algorithm (Game AI) 6. Bayes Theorem Implementation 7. Linear Regression (Basic ML Model) 8. K-Nearest Neighbours (KNN) Classification <p>Tools: Python (Version 3.8 or above) Machine Learning Libraries (Exp. 6–8):</p> <ul style="list-style-type: none"> • NumPy for numerical operations • Pandas for handling datasets • scikit-learn for ML models (Linear Regression, KNN) • Matplotlib for visualization (optional but recommended) <p>Optional Tools : Google Colab Dataset Sources (For ML Experiments)</p> <ul style="list-style-type: none"> • Built-in datasets from scikit-learn CSV files (student marks, simple classification data) 	No Change	No Change
5	Teacher Specific Content			

MODE OF ASSESSMENT

B. End Semester Evaluation (ESE)

2.Practical (Marks Included)		Page No 90
Total Marks: 35	Duration: 2 Hrs.	
a. Viva -10 Marks b. Lab report - 5 Marks c. Demonstration – 20 Marks		

References (Modified)

1. Manikandan Panneerselvam , An introduction to Artificial intelligence and machine learning by , Schand publications 2023	Page No. 90
2. Gupta, Rohan, et al. "Artificial intelligence to deep learning: machine intelligence approach for drug discovery." Molecular diversity 25.3 (2021): 1315-1360.	
3. Watt, Jeremy, Reza Borhani, and Aggelos K. Katsaggelos. Machine learning refined: Foundations, algorithms, and applications. Cambridge University Press, 2020	
4. Akerkar, Rajendra. Introduction to artificial intelligence. PHI Learning Pvt. Ltd., 2014.	

Course Name: Industrial Automation

Course Code: MG5DSEEC301

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No. (Typographical Error Corrected)	Page No. 94
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COURSE CONTENT

Content for Classroom Transaction (Units)

Module	Units (Modified)	Course Description	Hrs	CO No.	Page No.	
1	1.1	No Change			95	
	1.2					
	1.3					
	Existing					Proposed
	1-4					1.4
2	No Change					
3						
4						

5	Teacher Specific Content	
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MODE OF ASSESSMENT

B. End Semester Evaluation (ESE) (Modified)

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	96
Short Answer	6 out of 8	6 x 5 = 30	
Essay	2 out of 4	2 x 12 = 24	

Course Name: Software Engineering

Course Code: MG5DSCECC302

Course Level	300-399 (Modified)	Page No. 97
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