

**GANDHI INSTITUTE OF TECHNOLOGY AND MANAGEMENT (GITAM)**

(Deemed to be University)

VISAKHAPATNAM \* HYDERABAD \* BENGALURU

Accredited by NAAC with A<sup>++</sup> Grade

**GITAM School of Technology**



**CURRICULUM AND SYLLABUS**

**4 Year Undergraduate Programme  
UEECE01: B.Tech. Electronics and  
Communication Engineering**

w.e.f. 2024-25 admitted batch

(Updated on May 2024)

# Academic Regulations

**Applicable for the Undergraduate Programmes in the  
School of Technology (except B.Tech.CSBS)**

**<https://www.gitam.edu/academics/academic-regulations>**

# **GANDHI INSTITUTE OF TECHNOLOGY AND MANAGEMENT**

## **Vision**

GITAM will be an exceptional knowledge-driven institution advancing on a culture of honesty and compassion to make a difference to the world.

## **Mission**

- Build a dynamic application-oriented education ecosystem immersed in holistic development.
- Nurture valuable futures with global perspectives for our students by helping them find their ikigai.
- Drive impactful integrated research programmes to generate new knowledge, guided by integrity, collaboration, and entrepreneurial spirit.
- Permeate a culture of kindness within GITAM, fostering passionate contributors.

## **Quality Policy**

To achieve global standards and excellence in teaching, research, and consultancy by creating an environment in which the faculty and students share a passion for creating, sharing and applying knowledge to continuously improve the quality of education.

## **VISION AND MISSION OF THE SCHOOL**

### **Vision**

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## **VISION AND MISSION OF THE DEPARTMENT**

### **VISION**

To excel in Electrical, Electronics and Communication Technologies cultivating innovation with socio-ethical commitment

### **MISSION**

- Empower the students with knowledge to face real-world challenges for holistic development.
- Conduct multidisciplinary research that makes an impact on society, addressing key challenges through innovative solutions.
- Foster a culture emphasizing empathy, respect, commitment upholding the ethical standards.

**UEECE01: B.Tech. Electronics and Communication Engineering**  
**(w.e.f. academic year 2024-25 admitted batch)**

**Programme Educational Objectives (PEOs)**

<b>PEO 1</b>	Demonstrate comprehensive knowledge of analytical foundations to Electronics and Communication Engineering in terms of founding principles of circuits, design, computing, signal processing and communication.
<b>PEO 2</b>	Demonstrate critical thinking and problem-solving abilities to handle the real-world problems by applying theoretical foundations and practical skills in different fields of Electronics and Communication Engineering.
<b>PEO 3</b>	Exhibit qualities of teamwork, appreciation of collaboration that entails inter-disciplinary endeavors and the potential impact of technology on society.
<b>PEO 4</b>	Develop creativity, Research related skills, self-learning, entrepreneurial and leadership skills in order to meet the ever-changing needs and challenges in the profession.

**PEO Articulation**

	<b>PEO1</b>	<b>PEO2</b>	<b>PEO3</b>	<b>PEO4</b>
<b>M1</b>	H	H	M	M
<b>M2</b>	M	H	M	H
<b>M3</b>	L	M	H	M

H – High, M – Medium, L – Low

## Programme Outcomes (POs) and Programme Specific Outcomes (PSOs):

At the end of the Programme the students would be able to:

<b>PO1</b>	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO2</b>	Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO3</b>	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
<b>PO4</b>	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
<b>PO5</b>	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
<b>PO6</b>	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
<b>PO7</b>	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
<b>PO8</b>	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO9</b>	Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO10</b>	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
<b>PO11</b>	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

<b>PO12</b>	Life-long learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
<b>PSO1</b>	Demonstrate comprehensive knowledge and practical skills in Electronics and Communication Engineering focusing on subareas of Aerospace and Defence Electronics, Telecommunications, Sensors and IoT, AI and ML Applications and Software Defined Vehicles and apply this knowledge to solve advanced problems.
<b>PSO2</b>	Design and translate abstract concepts in circuits, communications, signal processing, computing and sensing to real-time circuits & systems and analyze their performance.
<b>PSO3</b>	Research and formulate suitable technologies for the implementation of Electronics and Communication Engineering solutions, demonstrating entrepreneurial and research aspects with a commitment to professional ethics and a focus on societal well-being.



# **Curriculum Structure**

*(Flexible Credit System)*

**Minimum Credit Requirements for the Award of Degree**

<b>S.No.</b>	<b>Course Category and Category Code</b>	<b>Minimum Credits</b>	<b>% of credits in the Programme</b>
1.	University Core (UC)	19	11.87
2.	Faculty Core (FC)	53	33.13
3.	Programme Core (PC)	49	30.62
4.	Programme Electives (PE)	15	9.38
5.	Open Electives (OE)	24	15.00
	<b>Total</b>	<b>160</b>	<b>100</b>

University Core (UC) : 19 Credits								
Course code	Level	Course Title	L	T	P	S	J	C
<b>Ability Enhancement Courses</b>								
LANG1201	100	<a href="#">Critical Thinking</a>	2	0	0	0	0	2
LANG1241	100	<a href="#">Communicative English - I</a>	0	0	4	0	0	2
LANG1251	100	<a href="#">Communicative English - II</a>	0	0	4	0	0	2
IENT1051	100	<a href="#">Fundamentals of Entrepreneurship</a>	2	0	0	0	0	2
<b>Skill Enhancement Courses</b>								
CLAD1041	100	<a href="#">Art of Persuasive Communication</a>	0	0	2	0	0	1
CLAD1051	100	<a href="#">Competence in Communication</a>	0	0	2	0	0	1
CLAD1061	100	<a href="#">Life Skills</a>	0	0	2	0	0	1
CLADXXXX	100	Soft Skills - 4	0	0	2	0	0	1
<b>Value Added Courses</b>								
ENVS1003	100	<a href="#">Environmental Studies</a>	3	0	0	0	0	3
POLS1051	100	<a href="#">The Indian Constitution</a>	1	0	0	0	0	1
<b>Pass / Fail Courses (Mandatory)</b>								
FINA1081	100	<a href="#">Personal Financial Planning *</a>	1	0	0	0	0	1
PHPY1011	100	<a href="#">Gandhi and the Contemporary World *</a>	1	0	0	0	0	1
<b>Pass / Fail Courses (Any one course to be chosen)</b>								
DOSP1181	100	<a href="#">Yogasana</a>	0	0	0	2	0	1
MFST1002	100	<a href="#">Health and Wellbeing *</a>	0	0	2	0	0	1
DOSL1081	100	<a href="#">Student Life Activities (Participant)</a>	0	0	0	2	0	1
DOSL1091	100	<a href="#">Student Life Activities (Organizer)</a>	0	0	0	2	0	1
DOSL1101	100	<a href="#">Student Life Activities (Competitor)</a>	0	0	0	2	0	1
DOSL1111	100	<a href="#">Foundations of Student (Leadership)</a>	0	0	0	2	0	1
DOSL1042	100	<a href="#">Community Services – Volunteer</a>	0	0	2	0	0	1
DOSL1052	100	<a href="#">Community Services – Mobilizer</a>	0	0	2	0	0	1
DOSP1003	100	<a href="#">Badminton</a>	0	0	0	2	0	1
DOSP1033	100	<a href="#">Football</a>	0	0	0	2	0	1
DOSP1043	100	<a href="#">Volleyball</a>	0	0	0	2	0	1
DOSP1053	100	<a href="#">Kabaddi</a>	0	0	0	2	0	1
DOSP1073	100	<a href="#">Table Tennis</a>	0	0	0	2	0	1
DOSP1083	100	<a href="#">Handball</a>	0	0	0	2	0	1
DOSP1093	100	<a href="#">Basketball</a>	0	0	0	2	0	1
DOSP1113	100	<a href="#">Throw ball</a>	0	0	0	2	0	1
DOSP1142	100	<a href="#">Cricket</a>	0	0	0	2	0	1
DOSP1132	100	<a href="#">Functional Fitness</a>	0	0	0	2	0	1
DOSP1171	100	<a href="#">Martial Arts/Self Defence</a>	0	0	0	2	0	1

\* Massive Open Online Course (MOO)

FACULTY CORE (FC) : 53 credits								
Course code	Level	Course title	L	T	P	S	J	C
MATH1341	100	<a href="#">Calculus and Differential Equations</a>	3	1	0	0	0	4
MATH1272	100	<a href="#">Linear Algebra</a>	3	1	0	0	0	4
MATH2581	200	<a href="#">Probability theory and Random process</a>	3	1	0	0	0	4
MATH2591	200	<a href="#">Complex variables and transform techniques</a>	3	1	0	0	0	4
PHYS1001	100	<a href="#">Physics</a>	2	1	2	0	0	4
CHEM1111	100	<a href="#">Engineering Chemistry</a>	2	1	2	0	0	4
24CSEN1031	100	<a href="#">Programming for Problem Solving - 1</a>	0	0	6	0	0	3
24CSEN1041	100	<a href="#">Programming for Problem Solving - 2</a>	0	0	6	0	0	3
24xxxxxxx		Engineering Basket - Choice 1	2	0	2	0	0	3
24xxxxxxx		Engineering Basket - Choice 2	2	0	2	0	0	3
MECH1011	100	<a href="#">Engineering Visualization and Product Realization</a>	0	0	4	0	0	2
MECH1041	100	<a href="#">Technology Exploration and Product Engineering</a>	0	0	4	0	0	2
24PROJ4777	400	Capstone Project - Introduction	0	0	0	0	2	1
24IENT3777	300	Internship-1	0	0	0	0	2	1
24PROJ4888/ 24IENT4888 / 24RESH4888	400	Capstone Project - Final / Internship-2 / Research	0	0	0	0	16	8
HSMCH102	100	Universal Human Values 2: Understanding Harmony	2	1	0	0	0	3

Engineering Basket 1 & 2

Six credits have to be chosen from the basket other than Parent Department course.

Course code	Level	Course title	L	T	P	S	J	C
24EECE2221	200	<a href="#">Fundamentals of Sensors and Internet of Things</a>	2	0	2	0	0	3
24EECE2211	200	<a href="#">Fundamentals of Electrical and Electronics Engineering</a>	2	0	2	0	0	3
24EECE2231	200	<a href="#">Foundations of Electrical and Electronics Engineering</a>	3	0	2	0	0	4
24MECH1001	100	<a href="#">Introduction to Mechanical Engineering</a>	2	0	2	0	0	3
24CIVL1001	100	<a href="#">Introduction to Civil Engineering</a>	2	0	2	0	0	3
24BTEN1021	100	<a href="#">Biotechnology and Bioengineering</a>	2	0	2	0	0	3
24BTEN1031	100	<a href="#">Introduction to Biomedical Engineering</a>	2	0	2	0	0	3
24CSEN2261	200	<a href="#">Data Structures and Algorithms</a>	2	0	2	0	0	3

Programme Core (PC) : 49 credits								
49 credits to be earned through programme core courses.								
Course code	Level	Course Title	L	T	P	S	J	C
24EECE1001	100	<a href="#">Network Theory and Analysis</a>	2	1	0	0	0	3
24EECE2001	200	<a href="#">Electronic Devices and Circuits</a>	3	0	2	0	0	4
24EECE2071	200	<a href="#">Analog Circuits</a>	3	0	2	0	0	4
24EECE3001	300	<a href="#">Introduction to VLSI Design</a>	3	0	2	0	0	4
24EECE2011	200	<a href="#">Signals and Systems</a>	2	1	0	0	0	3
24EECE2111	200	<a href="#">Electromagnetic Waves and Transmission Lines</a>	2	1	0	0	0	3
24EECE3011	300	<a href="#">Antennas Analysis and Design</a>	2	0	2	0	0	3
24EECE3021	300	<a href="#">Analog and Digital Communications</a>	3	0	2	0	0	4
24EECE3031	300	<a href="#">Data Communication and Networking</a>	3	0	0	0	0	3
24EECE3041	300	<a href="#">Control Systems</a>	2	1	0	0	0	3
24EECE2291	200	<a href="#">Digital Logic Design</a>	3	0	2	0	0	4
24EECE3051	300	<a href="#">Computer Organization and Design</a>	3	0	0	0	0	3
24EECE3061	300	<a href="#">Microprocessors and Microcontrollers</a>	3	0	2	0	0	4
24EECE3071	300	<a href="#">Digital Signal Processing</a>	3	0	2	0	0	4

Programme Elective (PE) : 15 credits								
A minimum of 15 credits from any one of the tracks								
Track # Aerospace & Defence Electronics								
Course code	Level	Course Title	L	T	P	S	J	C
24AERO2091	200	<a href="#">Aerospace and Defence Electronics Basics</a>	3	0	0	0	0	3
24AERO3221	300	<a href="#">Avionics Systems and Technologies</a>	3	0	0	0	0	3
24EECE4001	400	<a href="#">Satellite Communications</a>	3	0	0	0	0	3
24EECE3081	300	<a href="#">Radar Systems and Signal Processing</a>	3	0	0	0	0	3
24CSEN2301	200	<a href="#">Fundamentals of Cyber Security</a>	2	0	2	0	0	3
24EECE3091	300	<a href="#">Electromagnetic Compatibility</a>	3	0	0	0	0	3
24EECE3101	300	<a href="#">Digital Image Processing</a>	3	0	0	0	0	3
24EECE3111	300	<a href="#">Command, Control and Communication Systems</a>	3	0	0	0	0	3
24EECE3121	300	<a href="#">Jamming and ECM/ECCM Technologies</a>	3	0	0	0	0	3
24EECE2301	200	<a href="#">Embedded Systems</a>	2	0	2	0	0	3
24EECE4011	400	<a href="#">Unmanned Aerial Vehicles</a>	2	0	2	0	0	3
24EECE3131	300	<a href="#">Electronic Packaging and Testing</a>	3	0	0	0	0	3

<b>Track # : Telecommunications</b>							
24EECE4021	400	<a href="#">Software Defined Radio and Networks</a>	3	0	0	0	3
24EECE4001	400	<a href="#">Satellite Communications</a>	3	0	0	0	3
24EECE4031	400	<a href="#">Optical Communications and Networks</a>	3	0	0	0	3
24EECE3141	300	<a href="#">Principles of Radar Systems</a>	3	0	0	0	3
24EECE3151	300	<a href="#">Information Theory and Coding</a>	3	0	0	0	3
24EECE3161	300	<a href="#">Fundamentals of Wireless Communications</a>	3	0	0	0	3
24EECE3171	300	<a href="#">Mobile Communication System with Optimization</a>	3	0	0	0	3
24EECE2021	200	<a href="#">Applied Linear Algebra with Machine Learning, Wireless Communication and Data Analytics</a>	2	0	2	0	3
24EECE4041	400	<a href="#">LTE and Advanced LTE Technologies for Mobile Communications</a>	3	0	0	0	3
24EECE4051	400	<a href="#">5G Technologies and Its Applications</a>	3	0	0	0	3
<b>Track # : Sensors and IoT</b>							
24EECE2031	200	<a href="#">Introduction to IoT and its Applications</a>	3	0	0	0	3
24EECE2041	200	<a href="#">IoT Sensors and Actuators</a>	3	0	0	0	3
24EECE3181	300	<a href="#">IoT Architecture and Protocols</a>	3	0	0	0	3
24CSEN3261	300	<a href="#">IoT Security and Privacy</a>	3	0	0	0	3
24CSEN3271	300	<a href="#">Cloud Computing for IoT</a>	3	0	0	0	3
24EECE2051	200	<a href="#">Embedded Systems for IoT</a>	2	0	2	0	3
24EECE4061	400	<a href="#">Wireless Sensor Networks</a>	3	0	0	0	3
24EECE3191	300	<a href="#">IoT Device Design and Development</a>	3	0	0	0	3
24EECE3201	300	<a href="#">Industrial IoT and Automation</a>	3	0	0	0	3
24EECE3211	300	<a href="#">IoT for Transportation</a>	3	0	0	0	3
<b>Track # : AI and ML Applications</b>							
24CSEN2311	200	<a href="#">Machine Learning Techniques</a>	2	0	2	0	3
24CSEN2321	200	<a href="#">Fundamentals of Neural Networks</a>	2	0	2	0	3
24CSEN2331	200	<a href="#">Fundamentals of Deep Learning</a>	2	0	2	0	3
24CSEN3281	300	<a href="#">Fundamentals of Natural Language Processing</a>	3	0	0	0	3
24EECE4071	400	<a href="#">Machine Learning for Audio, Image, and Video Analysis</a>	3	0	0	0	3
24EECE4081	400	<a href="#">Machine Learning for Antenna Array Applications</a>	3	0	0	0	3
24EECE4091	400	<a href="#">Applications of Artificial Intelligence in VLSI Design</a>	3	0	0	0	3

24EECE4101	400	<a href="#">Wireless Communications with Artificial Intelligence</a>	3	0	0	0	0	3
24EECE4111	400	<a href="#">Embedded Systems with Artificial Intelligence</a>	3	0	0	0	0	3
<b>Track # : Software Defined Vehicles</b>								
24MECH2081	200	<a href="#">Fundamentals of Automotive Engineering</a>	3	0	0	0	0	3
24EECE3221	300	<a href="#">Introduction to Automotive Electronics and Vehicle Architecture</a>	3	0	0	0	0	3
24CSEN2341	200	<a href="#">Software Engineering for Automotive Applications</a>	3	0	0	0	0	3
24EECE3231	300	<a href="#">Vehicle Networks and Communication Protocols</a>	3	0	0	0	0	3
24EECE3241	300	<a href="#">Automotive Embedded Systems and Operating Systems</a>	3	0	0	0	0	3
24EECE3251	300	<a href="#">Model Based System Design</a>	3	0	0	0	0	3
24CSEN3291	300	<a href="#">Automotive Cyber Security</a>	3	0	0	0	0	3
24EECE4121	400	<a href="#">Advanced Driver Assistance Systems (ADAS) System Design</a>	3	0	0	0	0	3
24EECE3261	300	<a href="#">Introduction to AUTOSAR</a>	3	0	0	0	0	3
24EECE4131	400	<a href="#">Vehicle-to-Everything (V2X) Communications</a>	3	0	0	0	0	3
24EECE2061	200	<a href="#">Introduction to Electric Vehicle Technologies</a>	3	0	0	0	0	3

## Open Electives (OE)

A minimum of 24 credits are to be earned under this category of courses, out of which 9 credits are from other departments from the School of Technology and the remaining 15 credits are from schools other than the School of Technology.

The current list of courses offered under OE will be available through the registration portal. Refer [here](#) for the tentative list of courses offered under OE category



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