Indian Institute of Information Technology Sri City, Chittoor

भारतीय सूचना प्रौद्योगिकी संस्थान श्री सिटी, चित्तूर

Online

MTech IoT and Autonomous Systems

Power Your Career with Cutting-Edge Tech from IIIT Sri City

2 years | Online | ₹2,62,000 | Graduate from an IIIT

IIIT Sri City: Shaping Future Tech Leaders

Nestled in the vibrant hub of Sri City, Andhra Pradesh, IIIT Sri City (IIITS) is a premier institute of national importance, established in 2013 under the Ministry of Education, Government of India. Known for its cutting-edge IT education, research, and innovation, IIITS offers B.Tech., M.Tech., M.S., and Ph.D. programs in AI, Machine Learning, Data Science, Cyber Security, and more.

What sets IIITS apart? A UG-led research approach, a globally acclaimed faculty, and an industry-driven curriculum designed to solve real-world challenges. With a dynamic learning environment, students engage in experiential learning, research projects, and vibrant cultural & technical clubs to foster innovation and entrepreneurship.

At IIIT Sri City, we are on a mission to compete with the world's top 100 tech universities, shaping future leaders who will transform technology and society.

Director's Message

Prof MV Kartikeyan
Director, IIIT Sri City

IIIT Sri City, is an institute of national importance, established under the act of parliament in 2013. IIIT Sricity is strategically located adjacent to Sricity, a major industrial hub, and is well-connected to key cities - just 70 km from Chennai and 70 km from Tirupati. This unique positioning allows us to foster strong industry collaborations, providing students with real-world exposure and research-driven insights.

IIIT Sri City, established under a public-private partnership model, is dedicated to nurturing the next generation of leaders in technology and research. Our students, drawn from across India, bring a diverse array of talents & perspectives. The institute prides itself on its cutting-edge curriculum, emphasis on real-world applications, and a vibrant ecosystem of creativity and intellectual pursuit. Our talented students have consistently demonstrated excellence in academics, innovation, and extracurricular activities, contributing to societal & technological advancements.

Inline with our existing campus education, present M.Tech Online program is designed to empower working professionals and aspiring technologists with advanced skills in emerging domains. With a rigorous curriculum, expert faculty, and industry-relevant projects, this program ensures a perfect blend of theoretical foundations and practical applications. In line with NEP, the flexible learning model allows a person at any stage of their career to upskill while continuing his professional journey. Importantly, the online model would allow students who are working in different geographies to attend and learn in this program. Whether you are looking to enhance your technical proficiency or explore new career opportunities, this program will be a significant milestone in your professional growth.

I encourage you to make the most of this opportunity, engage actively with your mentors, and contribute to the vibrant learning community. We look forward to seeing you excel and innovate in your chosen field.

Jai Hind

Prof MV Kartikeyan
Director

Program Overview

The Executive M.Tech in IoT and Autonomous Systems equips professionals with advanced knowledge in IoT architecture, communication protocols, and autonomous decision-making systems. This program blends theoretical foundations with hands-on applications, ensuring graduates are well-prepared for high-impact roles in IoT, wireless communication, and autonomous technologies.Through real-world IoT system implementations, students will gain expertise in Cyber-Physical Systems, AI-driven decision-making, and 5G/6G networks. The capstone and major projects allow learners to apply their skills in end-to-end IoT solutions and autonomous systems development.

Last Date for Applications - 30th June 2025

- **Commencement Date: 5th August (Tuesday)**
- **Campus Immersion Opportunity: One week per year**
- **Alumni Status: Earn IIIT Sri City alumni status upon completion, with access to the Alumni Portal and exclusive networking opportunities**

COURSE ELIGIBILITY

(a) Applicants should have a B.Tech / BE /BS/ M.Tech / MSc (4 semesterprogram) / MCA (4-semester program) / MS Degree (min. 4 semester) /equivalent degree in the relevant discipline with at least 55% marks or 5.5/10 CPI. In the case of the candidate belonging to SC, ST, or Persons with Disability (PwD) category, this is relaxed to 50% or equivalent 5.0 CGPA/CPI

(b) For MCA/MSC passed graduates, the percentage score of MCA/MSC would be considered. For BE/BTech Engineering graduates without PG specialization, the percentage score of the undergraduate degree would be considered. For a post-graduation in the Engineering field of study,

(c) PG score qualification can be considered.

(d) GATE is not mandatory.

Selection process will be scheduled post-counseling & application process, depending on the number of eligible applications as per seat availability for the program. This entire process will be online.

Candidates who do not meet the minimum CGPA or percentage requirement, can still be considered if they provide relevant work experience in the technical field.

Who Should Apply?

This program is ideal for:

Working professionals looking to specialize in IoT and Autonomous Systems.

Individuals with a background in Computer Science, Electronics, or related fields.

Professionals aiming for roles in IoT, AI-driven automation, and smart systems.

Research enthusiasts seeking hands-on experience in network security, digital twins, and autonomous systems development.

Why Choose IIIT Sri City for Your M.Tech in IOT & Autonomous Systems?

Prestigious IIIT Certification

Earn a highly regarded certification from IIIT Sri City, recognized globally in the tech industry.

Distinguished Faculty

Learn from renowned experts with interdisciplinary experience in IoT, autonomous systems, AI, and wireless communication.

Industry-Aligned Curriculum

Designed to match the latest global IT and AI trends, ensuring graduates are future-ready.

Robust Industry Ties

Collaborations with top tech firms provide real-world exposure and practical applications of IoT and AI.

Placement Guidance

Get access to expert career counseling, resume-building support, and interview preparation resources to help you make informed career decisions and confidently pursue job opportunities.

Experiential Learning

The program encourages hands-on projects, real-world system implementation, and practical learning.

IIIT Sri City Alumni Status

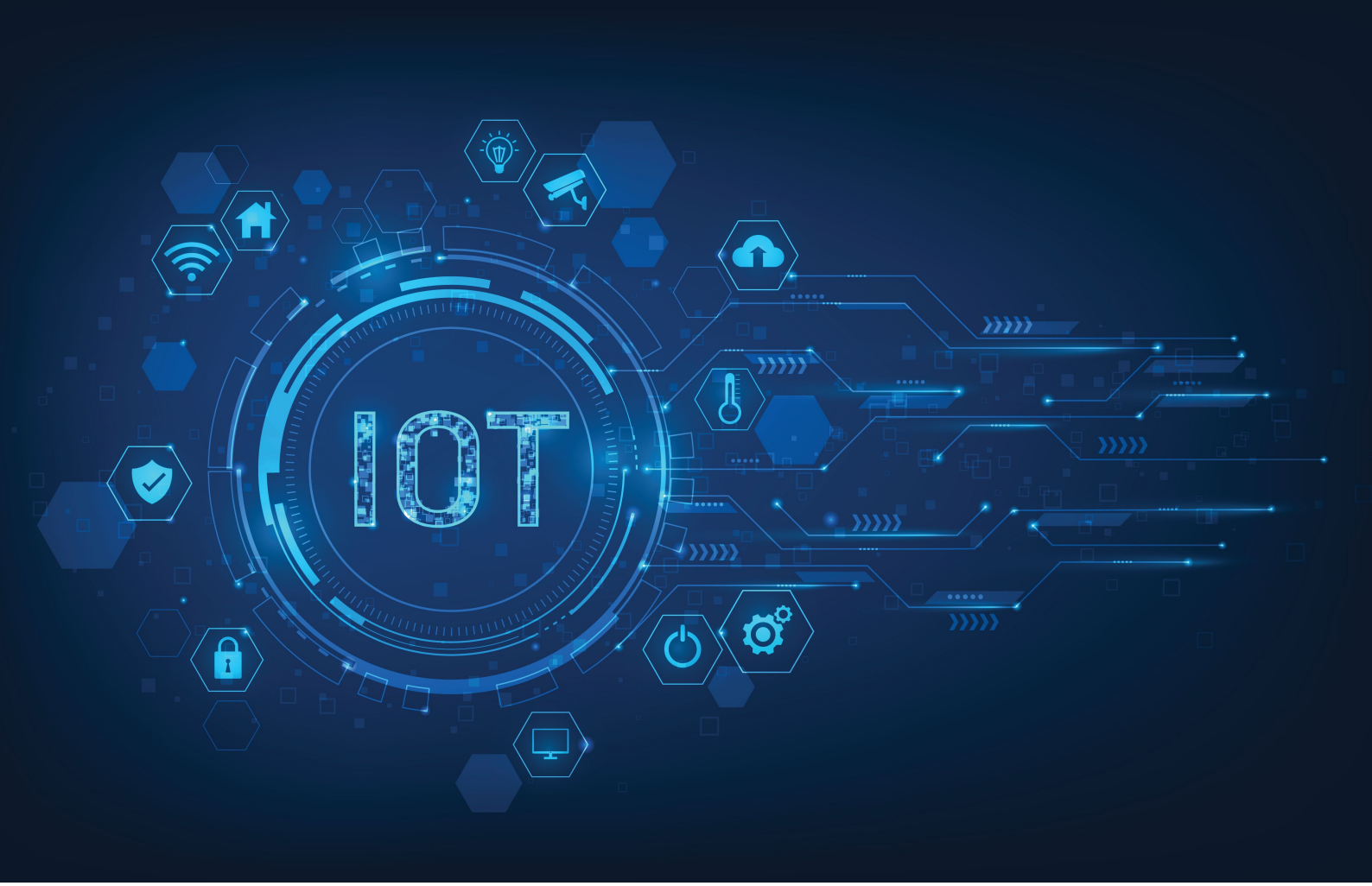
Earn IIIT Sri City alumni status upon completion of the program, with access to the exclusive Alumni Portal & valuable networking opportunities with industry leaders, cybersecurity experts, & researchers

Research & Innovation Focus

Strong emphasis on high-impact research, publications, funded projects, and cutting-edge autonomous technology.

Flexible Online Learning for Professionals

Designed for working professionals, allowing you to upskill without career disruption.



Program Objectives

Comprehensive IoT Understanding -
Develop a strong foundation in IoT architecture and Cyber-Physical Systems.

Mastering Wireless Communication -
Gain expertise in wireless networks, IoT communication protocols, and advanced connectivity solutions (5G/6G).

Autonomous Systems Development -
Learn how to design and implement AI-driven autonomous systems for real-world applications.

Hands-on Experience -
Work with IoT devices, network simulations, Python programming, and intelligent system deployment.

Security & Reliability -
Understand network security and risk mitigation strategies in IoT ecosystems.

Practical Implementation -
Apply concepts through real-world projects, minor and major projects, and a capstone project in IoT applications.

Course Structure

Semester - I

Course Name	L	T	P	Credits
Fundamentals of IoT	3	1	0	4
Introduction to Cyber-Physical Systems	3	1	0	4
Autonomous Systems Fundamentals	3	1	0	4
Wireless Communication	3	1	0	4

Total - 16 Credits

Semester - II

Course Name	L	T	P	Credits
Advanced Wireless Communication & IoT Protocols	3	1	0	4
Intelligent & Autonomous Systems	3	1	0	4
Network Simulation & Python Programming	1	1	2	4
Capstone Project: End-to-End IoT Application	0	0	4	4

Total - 16 Credits

Semester - III

Course Name	L	T	P	Credits
5G/6G Wireless Communication	3	1	0	4
Network Security	3	0	1	4
Digital Twin Concepts & Applications	3	1	0	4
Minor Project	0	0	4	4

Total - 16 Credits

Semester - IV

Course Name	L	T	P	Credits
Applications of Autonomous Systems (Aerial & Underwater Vehicles)	2	2	0	4
Major Project	0	0	12	12

Total - 16 Credits

Course Framework

Semester - I

Course Name	L	T	P	Credits
Introduction to Internet of Things	3	1	0	4
Fundamentals of IoT & Its Ecosystem Connectivity Technologies in IoT Communication Protocols in IoT Advanced IoT Sub-Modules & Emerging Technologies Arduino-Based IoT Development Raspberry Pi for IoT & Cloud Integration				

Course Name	L	T	P	Credits
Introduction to Cyber Physical System	3	1	0	4
Introduction to Cyber Physical System Examples and Basic Technologies CPS - Platform components Introduction to Robotics Principles of Automated Control Design CPS Case Studies: Automotive				

Course Name	L	T	P	Credits
Digital Twins - Concepts and Applications	3	1	0	4
Introduction to Industry 4.0 Digital Twins in Industry 4.0 Building Blocks of Digital Twins Digital Shadow & Digital Thread Types & Applications of Digital Twins Communication & AI Integration in Digital Twins				

Course Name	L	T	P	Credits
Intelligent and Autonomous System (IAS)	3	1	0	4
Introduction to Autonomous Systems Intelligent Systems & Knowledge Processing Wireless Sensor Networks & Communication Technologies Design & Development of Autonomous Systems Case Studies in Intelligent & Autonomous Systems Prediction Algorithms & Integral Communication Systems				

Total - 16 Credits

Semester - II

Course Name	L	T	P	Credits
Wireless Communication	3	1	0	4
Introduction to Wireless Communication Systems Cellular Network Strategies & Access Techniques Radio Wave Propagation & Path Loss Models Small-Scale Multipath Propagation & Fading Wireless System Components & Data Transmission Advanced Wireless Technologies				

Course Name	L	T	P	Credits
Advanced Wireless Communications and IoT Protocols	3	1	0	4
MIMO and Massive MIMO OFDM, Non-Orthogonal multiple access (NOMA) Multihop Communication Ultra-Wide Band, Cognitive Radio & Software Defined Radio Self Organising Networks (SON) TX-RX Chain Prototype				

Course Name	L	T	P	Credits
B4G/5G/Advanced Topics in Communication Systems	3	1	0	4
System architectures Communications protocols Applications Advanced Communication Paradigms Smart/Intelligent Communication Systems Security and privacy engineering				

Course Name	L	T	P	Credits
Introduction to Cyber Security and Network Security	3	1	0	4
Foundations of Cybersecurity Security Layer Data Security and Access Control Network Security Operating System Security Incidence Response				

Total - 16 Credits

Semester - III

Course Name	L	T	P	Credits
Technologies for IoT and Autonomous System	2	1	1	4
Control Systems for Autonomous Systems Sensing and Perception I Sensing and Perception II Navigation SDN in IoT Cloud Computing, Service models for IoT				

Course Name	L	T	P	Credits
Networks, Data Science and Python Programming	3	0	1	4
Introduction to Python Introduction to NumPy and 2D plotting Scientific computing using SciPy Time-series analysis and data manipulation with Pandas Data Access and Visualization Introduction to machine learning with Scikit-Learn				

Total - 16 Credits

Semester - IV

Course Name	L	T	P	Credits
Applications of Autonomous Systems: Aerial and Underwater Autonomous Vehicle	2	1	1	4
Sensors for aerial and underwater vehicles Motion Planning and Control Strategies AI-Driven Decision Making for Autonomous Vehicles Design and Architecture of Autonomous Vehicles Applications and Future of Autonomous Systems				

Total - 16 Credits

Expanded Syllabus

Semester - I

Introduction to Internet of Things (IoT)

Unit-1

- **Fundamentals of IoT & Its Ecosystem:** What is IoT? Definition and core concepts, Evolution of IoT, IoT architecture: Sensing, communication, cloud, and data analytics, Components of an IoT system: Sensors, actuators, communication devices, edge devices, IoT applications in various sectors: Smart homes, healthcare, industrial IoT (IIoT), agriculture, and cities, Challenges in implementing IoT: Scalability, interoperability, and integration.

Unit-2

- **Connectivity technologies:** IEEE 802.15.4, RFID, NFC, Bluetooth, LoRa, Wi-Fi, Cellular etc.

Unit-3

- **Communication Protocols in IoT:** Overview of communication protocols in IoT, Wired vs. wireless communication, Short-range communication protocols: Zigbee, Bluetooth, BLE (Bluetooth Low Energy), Long-range communication protocols: LoRa, NB-IoT (Narrowband IoT), LTE-M, IP-based communication: MQTT, CoAP (Constrained Application Protocol), Choosing the right communication protocol for IoT systems based on requirements (range, power, bandwidth)

Unit-4

- **Advanced IoT Sub-Modules & Emerging Technologies:** Sub-modules of IoT - Sensor Networks for IoT topologies, Coverage, Mobility, Interoperability of IoT, Evolving technologies part of IoT - UAV, M2M.

Unit-5

- **Arduino-Based IoT Development:** basics of arduino programming: arduino IDE, introduction to arduino boards, Wi-Fi Module (ESP8266/ESP32), Bluetooth (HC-05), communication/interfacing with Sensors and Actuators, Serial Communication (UART), building basic IoT projects.

Unit-6

- **Raspberry Pi for IoT & Cloud Integration:** Introduction to Raspberry Pi, Raspberry Pi vs Arduino, Setting Up Raspberry Pi, Raspberry Pi Programming Basics, Sensors and Actuators with Raspberry Pi, Setting up wifi, bluetooth, MQTT and LoRA, cloud integration and advanced IoT projects.

Introduction to Cyber Physical System (ICPS)

Unit-1

- **Introduction to Cyber Physical System:** Definition of Cyber Physical System (CPS) - Basic principles of design and validation of CPS - Inter-disciplinary nature of CPS.

Unit-2

- **Examples and Basic Technologies:** Importance of different Basic Technologies, Control, Communication and Computation - Data Analytics - Image/Video Processing, Industry 4.0 and IIoT, Automation and Applications

Unit-3

- **CPS - Platform components:** CPS HW platforms - Processors, Sensors, Actuators - CPS Network – Bluetooth, Zigbee, RFID, CAN, Automotive Ethernet - CPS Sw stack - RTOS, Scheduling Real Time control tasks

Unit-4

- **Introduction to Robotics:** Introduction to Robotics for CPS - Robotic Kinematics and Dynamics - Degree of Freedom, Manipulators - Mathematics involved in Robotics - Applications to Cyber Physical System

Unit-5

- **Principles of Automated Control Design:** Principle and motivation - Controller Design Techniques - Model Predictive Controller (MPC) - Understanding sub system behaviour - Carry out end-to-end simulation

Unit-6

- **CPS Case Studies:** Automotive: S/w controller for ABS, ACC, Lane Departure warning, Suspension control, Real-time recommendation; Healthcare: Artificial infusion, Pacemaker; Green Building: Automated lighting, AC Control, etc.

Digital Twins - Concepts and Applications

Unit-1

- **Introduction to Industry 4.0:** Industry 4.0 environment, Technologies transforming Industry 4.0, Understanding CPS and IoT;

Unit-2

- **Digital Twins in Industry 4.0:** Basic Concepts of Digital Twins-Definition and features; Digital Twins in Industry 4.0 - Real time usage of Digital Twins, Existing DT examples;

Unit-3

- **Building blocks of Digital Twins:** Different planes in DT Data, Model and Service planes of a DT; Industry case study examples-Industry case study-1 & 2 with Data, Model and service plan details;

Unit-4

- **Digital Shadow & Digital Thread:** Introduction of Digital shadow, Example of Digital shadow; Digital Thread - Introduction of Digital shadow, Example of Digital shadow, Relation of Digital Shadow and Thread with DT;

Unit-5

- **Types & Applications of Digital Twins:** Based on Product, process, Based on Functionality, Based on Maturity; Selecting the Digital Twins for an operation-Selecting the DT for an operation, Digital Twins: benefits and Applications;

Unit-6

- **Communication & AI Integration in Digital Twins:** Communication aspects of Digital Twin-Integration of heterogeneous subsystems in a DT - Introduction to OPC-UA, Work flow of OPC UA, Implementing an end to end OPC UA framework with MATLAB, Prosys server and UA clients; Digital Twin Use cases-Healthcare - Manufacturing domain, Predictive Maintenance, Anomaly detection, Automotive sector - Aerospace, Agriculture; Digital Twin opportunities-Role of AI/ML in Digital Twins, Summary and Future of DT: Future Digital Twins;

Intelligent and Autonomous System (IAS)

Unit-1

- **Autonomous Systems:** Introduction - Concept and definitions - Embedded Systems, Computer Networks, M2M (Machine to Machine Communication), Internet of Everything (IoE), Machine Learning, Industrial automation

Unit-2

- **Intelligent Systems:** Concept of Data, Information, Knowledge and Wisdom - Knowledge discovery process (Image, ML, Data Analytics) - PLC vs Microcontrollers: cost, performance, and power - Selection criteria and tradeoffs - Industrial networks, M2M networks

Unit-3

- **Wireless Sensor Networks:** Sensor nodes - WSN communication technologies: LoRA, Zigbee and WiFi; Cellular communication and LPWAN technologies

Unit-4

- **Design and Development:** Reference architectures - Standardisation initiatives - Interoperability issues - Industrial Internet Reference - Architecture from Industrial Internet Consortium (IIC) - Networks, communication technologies and protocols - AI/ML in Automation for Industry 4.0 applications: Deep learning models

Unit-5

- **Case Studies:** Intelligent and Autonomous Systems - Smart factories and cyber physical systems - Autonomous Driving - Predictive maintenance, Anomaly detection etc.

Unit-6

- **Algorithms for Prediction and Integral Communication systems:** Need for integral Communication model for autonomous systems - Introduction to Kalman Filter - Single and multi-dimensional Kalman filters - OPC UA and hands-on with MATLAB and Prosys server, UA client

Semester - II

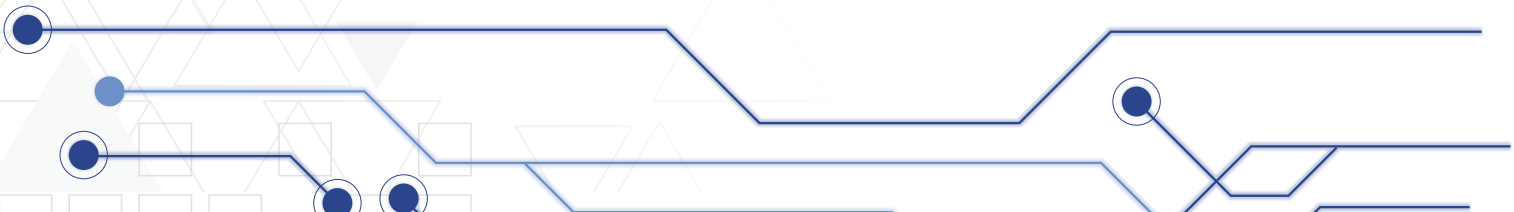
Wireless Communication

Unit-1

- **Introduction to Wireless Communication Systems:** Overview of wireless communication, Examples of Wireless Communication Systems. Trends in Cellular Radio and Personal Communications, Second Generation (2G) Cellular Networks. Third Generation (3G) Wireless Networks, 4G LTE. Wireless Local Area Networks (WLANs). Bluetooth and Personal Area Networks (PANs)

Unit-2

- **Cellular Network Strategies & Access Techniques:** Introduction. Frequency Reuse. Channel Assignment Strategies. Handoff Strategies. Interference and System Capacity. Trunking and Grade of Service. Improving Coverage & Capacity in Cellular Systems. Intra-cell and Inter-cell Interference, Erlang-B and C Chart. Multiple Access techniques – FDMA, TDMA, CDMA.



Unit-3

- **Radio Wave Propagation & Path Loss Models:** Introduction to Radio Wave Propagation. Free Space Propagation Model. Relating Power to Electric Field. The Three Basic Propagation Mechanisms. Reflection. Ground Reflection (Two-Ray) Model. Diffraction. Scattering. Practical Link Budget Design Using Path Loss Models. Outdoor Propagation Models. Indoor Propagation Models. Signal Penetration into Buildings. Ray Tracing.

Unit-4

- **Small-Scale Multipath Propagation & Fading:** Small-Scale Multipath Propagation. Impulse Response Model of a Multipath Channel. Small-Scale Multipath Measurements. Parameters of Mobile Multipath Channels. Types of Small-Scale Fading.

Unit-5

- **Wireless System Components & Data Transmission:** Frequency of operation, transmitter and receiver, Uplink/Downlink, TDMA/FDMA implementation, time frame and time slots, voice channel and control channel, Data rate, speech to data encoding.

Unit-6

- **Advanced Wireless Technologies:** Multiple Input Multiple Output (MIMO) Systems: Spatial Multiplexing and Channel Modelling, MIMO channel capacity and beamforming. Orthogonal Frequency Division Multiplexing (OFDM).

Advanced Wireless Communications and IoT Protocols

Unit-1

- **MIMO and Massive MIMO:** Traditional wireless System (1x1), 2 x 2 System, 4 x 4 System, Maths behind TX and RX, Nmax Transmission, Receiving mechanism

Unit-2

- **OFDM, Non-Orthogonal multiple access (NOMA):** Orthogonality, Mechanisms to achieve the same, Non orthogonal mechanisms, Effect on Multiple Access, Why NOMA

Unit-3

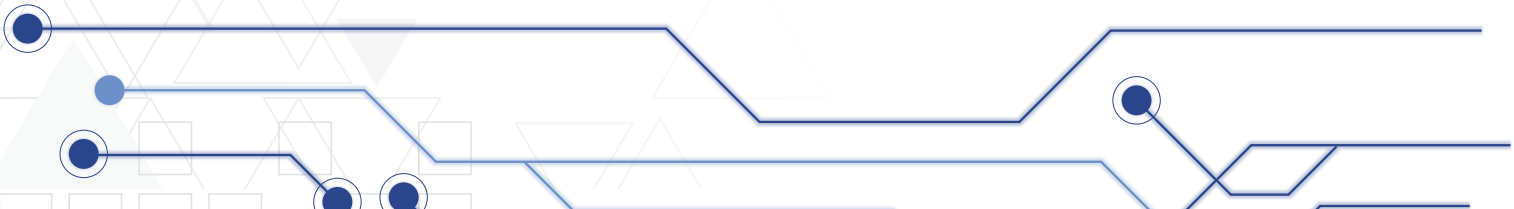
- **Multihop Communication:** No. of hops, Maths relation, Effect on Interference, Power relation, System Capacity

Unit-4

- **Ultra Wide Band, Cognitive Radio and Software Defined Radio:** Modulation and Demodulation, Spectral Efficiency, Distance, Cognition, Intelligent Radio, Programmable Design

Unit-5

- **Self Organising Networks (SON):** Self Configuration, Self Healing and Self Optimization



Unit-6

- **TX-RX Chain Prototype:** Modular implementation, Advantages, Challenges and Design Aspects

B4G/5G/Advanced Topics in Communication Systems

Unit-1

- **System architectures:** Software-defined networking, information-centric networking, Internet of Things (IoT), vehicular networking.

Unit-2

- **Communications protocols:** identifier-locator protocols, data-centre networking, multimedia systems, protocol development.

Unit-3

- **Applications:** participatory sensing, smart cities, cyber-physical systems, blockchain, crowd sensing, digital twin modelling

Unit-4

- **Advanced Communication Paradigms:** Ultra Reliable Low Latency Communications (URLLC), ubiquitous computing, vehicular networks, disruption- and delay-tolerant networks, mobile ad hoc networking, immersive environments

Unit-5

- **Smart/Intelligent Communication Systems:** Machine Learning/Artificial Intelligence approaches for 5G and next generation networks.

Unit-6

- **Security and privacy engineering:** Design, implementing and testing of security and privacy protocols for modern architectures, protocols, applications and systems, concepts of quantum Internet.

Introduction to Cyber Security and Network Security

Unit-1

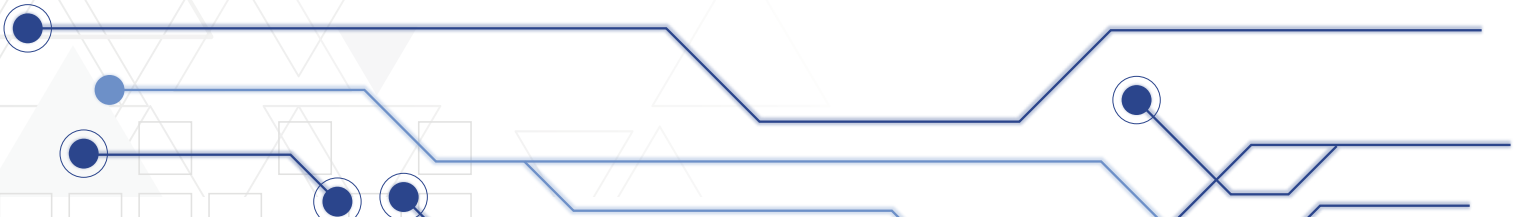
- **Overview:** Cyber security Concepts, Threats, Attacks, and Assets, Security Functional Requirements, Fundamental Security Design Principles, Attack Surfaces and Attack Trees, Security Strategy

Unit-2

- **Security Layer:** Human factors in cyber security, Perimeter Security, Network Security, EndPoint Security, Application Security

Unit-3

- **Data Security and Access Control:** Cryptography - symmetric and asymmetric encryption, basics of hashing, common use cases, Access Control - Authentication, Authorization



Unit-4

- **Network Security: Network Organization:** Firewalls, Proxies, DMZ, Internet security protocols and standards, Intrusion detection and prevention

Unit-5

- **Operating System Security:** Program Security: non-malicious program errors, viruses, controls against program threats; Protection in Operating Systems: protected objects, methods of protection, access control, authentication;

Unit-6

- **Incidence Response:** Incident Prioritization, Incident Handling, Disaster Recovery, Incident Response and Handling Process, Incident Management

Semester - III

Technologies for IoT and Autonomous System

Unit-1

- **Control Systems for Autonomous Systems:** Introduction to control theory, Feedback control systems: PID controllers, state-space models, Control in dynamic environments, Decision-making under uncertainty, Multi-agent control systems

Unit-2

- **Sensing and Perception I :** Introduction to perception in autonomous systems,Sensor types: Cameras, LiDAR, Radar, Ultrasonic, IMUs, GPS, Sensor fusion techniques

Unit-3

- **Sensing and Perception II :** Computer vision and image processing, Object detection and tracking, Environmental mapping (SLAM - Simultaneous Localization and Mapping), Sensor calibration and error handling.

Unit-4

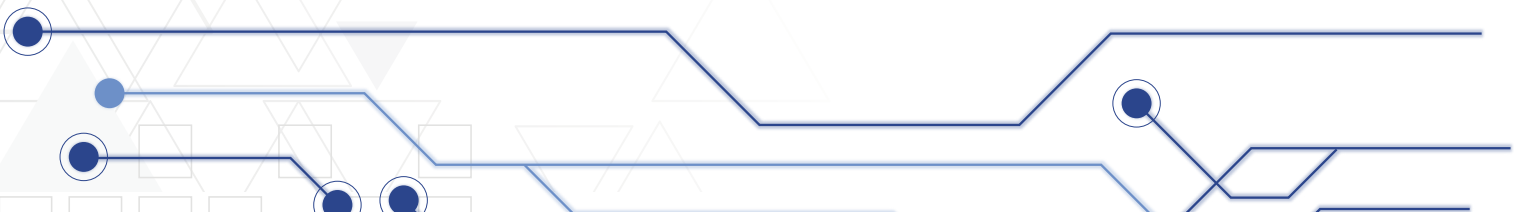
- **Navigation:** Motion planning Trajectory generation, path planning, Navigation algorithms: A*, Dijkstra, RRT (Rapidly-exploring Random Tree)

Unit-5

- **SDN in IoT :** Software Defined Networking (SDN), SDN-IoT architecture, applications of SDN in IoT Networking;

Unit-6

- **Cloud Computing, Service models for IoT:** Basics of Cloud computing, Service models, Openstack, Sensor Clouds, Fog Computing;



Networks, Data Science and Python Programming

Unit-1

- **Introduction to Python -** Python environmental setup and Essentials; Data types, Control flow, functions, Exception handling, Organizing code, File handling

Unit-2

- **Introduction to NumPy and 2D plotting:** Introduction to NumPy, Understanding N-dimensional data structure, Creating N-dimensional arrays, Indexing arrays and slicing, Boolean Indexing, Fancy Indexing, Data processing using arrays, File I/O with arrays, Plotting with matplotlib.Introduction to NumPy and 2D plotting - Introduction to NumPy, Understanding N-dimensional data structure, Creating N dimensional arrays, Indexing arrays and slicing, Boolean Indexing, Fancy Indexing, Data processing using arrays, File I/O with arrays, Plotting with matplotlib.

Unit-3

- **Scientific computing using SciPy:** Introduction to SciPy, Integration and optimization, Interpolation, Linear Algebra, Perform CDF and PDF using SciPy, Statistics, File I/O with SciPy.

Unit-4

- **Time-series analysis and data manipulation with Pandas:** Pandas I/O operations, Series and Data frames; Data alignment, aggregation and Summarization; Computation and analysis with Pandas, visualization.

Unit-5

- **Data Access and Visualization:** Querying SQL database with Python, Loading data from databases, Visual exploration with seaborn and matplotlib.

Unit-6

- **Introduction to machine learning with Scikit-Learn:** Estimator, Predictor, transformer interfaces; Preprocessing Data; Regression models and evaluation; Classifier models and evaluation; Clustering models and evaluation. 3. Course Outcomes (Unit wise):

Semester - IV

Applications of Autonomous Systems: Aerial and Underwater Autonomous Vehicle

Unit-1

- **Sensors for aerial and underwater vehicles:** Cameras, LiDAR, IMUs, Sonar, Acoustic positioning, Computer vision and image processing in aerial and underwater environments

Unit-2

- **Motion Planning and Control Strategies:** Localization and mapping (SLAM for aerial and underwater systems), Environmental factors (e.g., GPS limitations for underwater, visibility in water vs. air), Real-time data processing and decision-making

Unit-3

- **AI-Driven Decision Making for Autonomous Vehicles:** Motion planning algorithms for aerial and underwater systems (e.g., A*, RRT, potential fields), Path planning in constrained environments (airspace, underwater obstacles), Feedback Control and Dynamic Systems, Multi-vehicle coordination and formation control: Marine Control, Control in turbulent or unpredictable environments (e.g., air currents, ocean currents)

Unit-4

- **Autonomous Decision Making and AI for Aerial and Underwater Vehicles:** Decision-making in autonomous systems: Rule-based, behavior-based, and learning-based approaches, Reinforcement learning and decision-making in dynamic, uncertain environments, AI for path optimization and adaptive decision-making, Autonomous vehicle coordination and multi-agent systems (swarm intelligence), Real-time adaptive decision-making for aerial and underwater vehicles

Unit-5

- **Design, Architecture, and Implementation of Autonomous Vehicles:** System architecture for aerial and underwater vehicles: hardware and software components, Real-time operating systems (RTOS) and middleware for autonomy, Software development frameworks and simulation tools for autonomous systems (e.g., ROS, Gazebo), Safety, reliability, and fault-tolerant design.

Unit-6

- **Applications and Future of Autonomous Systems:** Advanced applications of AAVs and UUVs in defense, exploration, monitoring, and industrial sectors, Aerial and underwater vehicles in environmental monitoring, search and rescue, and agriculture, Autonomous vehicles for marine and space exploration, Regulatory challenges and ethical concerns in AAV and UUV deployment, Future of autonomous aerial and underwater systems.

Tools

Logos	Name of the Tool/Hardware	Application
	**Arduino IDE**	Enables rapid prototyping of IoT devices with embedded sensors and actuators for smart systems.
	**Raspberry Pi (Python)**	Facilitates development of edge-computing and automation solutions for autonomous and connected systems.
	**MATLAB**	Used for simulation, data analysis, and algorithm development in control systems, signal processing, and robotics.
	**C/C++**	Powers real-time system programming, firmware development, and performance-critical applications in embedded systems.
	**NS-3**	Simulates communication networks to design and evaluate protocols for IoT and vehicular networks.
	**SUMO/VEINS**	Models and simulates traffic and vehicle mobility patterns for intelligent transport and autonomous vehicle research.
	**OMNeT++**	Enables network-level simulations of distributed IoT systems, vehicular networks, and wireless sensor networks.
	**Python**	Widely used for data processing, machine learning, and IoT application development, integrating sensors, analytics, and cloud services.

Program Outcome

Understand IoT & Cyber-Physical Systems –
Gain an in-depth understanding of IoT architectures, smart networks, and autonomous decision-making systems.

Implement Wireless & IoT Communication Protocols –
Deploy advanced wireless communication technologies (5G/6G) and IoT connectivity solutions.

Develop & Optimize Autonomous Systems –
Design intelligent, AI-powered autonomous systems for industrial and real-world applications.

Apply Hands-on Technical Skills –
Work with Python-based network simulations, digital twin concepts, and real-world IoT deployments.

Enhance Network Security & Reliability –
Understand and implement security measures in IoT and wireless networks.

Deliver Industry-Ready IoT Solutions –
Work on end-to-end IoT applications, from concept to deployment, through capstone and major projects.

Innovate in Research & Development –
Contribute to cutting-edge research, IoT advancements, and autonomous technology innovations.

Admission Process

1

Check **Eligibility**

Ensure you meet the criteria.

Upload **Documents**

Submit degrees, mark sheets, and work experience proof (if required).

2

3

Verification & **Reverification**

Documents are verified by TeamLease EdTech and IIIT Sri City.

Admission Number **Generated**

Marks the completion of the admission process.

4

Exam & Assessment Structure

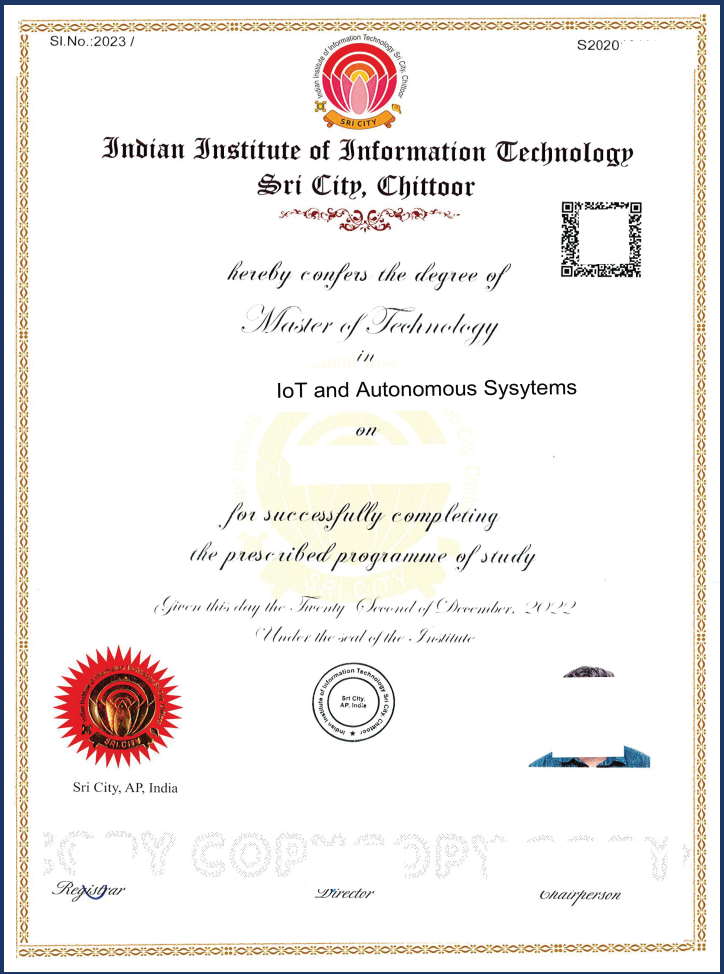
M.Tech online program in IoT and Autonomous Systems follows a structured evaluation system with mid-semester and end-semester exams assessing theoretical concepts. Continuous assessments, including lab work, assignments, projects, and quizzes, ensure ongoing evaluation aligned with course requirements.

Exam Type	Focus Areas
Mid-Sem Exam	Covers embedded systems, IoT architecture, basic machine learning algorithms, and sensor networks.
End-Sem Exam	Assesses advanced topics in IoT protocols, autonomous system design, real-time systems, and data analytics.
Continuous Assessments	Includes project work, lab-based assignments, IoT device development, and practical evaluations of autonomous system designs.

This proposed examination structure ensures that students are thoroughly assessed on both their theoretical knowledge and their ability to apply these concepts in real-world scenarios.

- Mid Semester Exam - 30%: (MCQs + Fill in the Blanks + Descriptive Questions)
- End Semester Exam - 40%: (MCQs + Fill in the Blanks + Descriptive Questions)
- Continuous Evaluation - 30% (To be decided by faculty course wise)

Program Certificate


Sl.No.:2023 /

S2020

Indian Institute of Information Technology
Sri City, Chittoor

hereby confers the degree of

Master of Technology

in

IoT and Autonomous Sysytems

on

for successfully completing
the prescribed programme of study

Given this day the Twenty Second of December, 2022
Under the seal of the Institute

Sri City, AP, India

Registrar Director Chairperson

Fee Structure

Online MTech IoT and Autonomous Systems					
Fees	**Sem1**	**Sem2**	**Sem 3**	**Sem 4**	**Total**
Instalment 1	40000	40000	40000	40000	
Instalment 2	25000 +2000	25000	25000	25000	
Optional Campus Immersion Fee		Actuals		Actuals	
Optional Alumni Fee			6000		
Total	**67000**	**65000**	**65000**	**65000**	**262000**

Fee Payment, Cancellation & Refund Policy:

Learners who opt for the 40,000 initial installment must complete the remaining 27,000 payment within 7 calendar days

Application Fee: Non-refundable.

Course Fee Refund:

1)A refund of 80% of the paid course fee will be issued if a request is raised before the Batch commencement date.

2)No refund will be provided on or after the batch commencement date.

Program Coordinator

Dr. Kandimalla Divyabramham

Associate Professor

Ph. D. (Indian Institute of Technology Kharagpur, India)

Dr. Kandimalla Divyabramham is an Associate Professor and Associate Dean of Student Affairs at IIIT Sri City, where he also serves as Chief Warden. He obtained his M.Tech and Ph.D. in Electronics & Electrical Communication Engineering from IIT Kharagpur. His research focuses on computational electromagnetics, including high-frequency asymptotic techniques, hybrid methods like the Method of Moments combined with the Uniform Theory of Diffraction, electromagnetic scattering, radar cross-section analysis, and the design of passive components for wireless applications.

In recognition of his work, Dr. Divyabramham was a finalist in the prestigious 2015 IEEE Symposium on Antennas and Propagation student paper competition, being one of 13 finalists out of 173 submissions and the sole representative from India in this category. He received a $1,000 USD financial support from the organizing committee. Additionally, he was awarded the International Travel Support (ITS) grant under the Young Scientist scheme from the Science and Engineering Research Board (SERB), DST, Government of India, to participate in the IEEE AP-S/URSI 2015 conference.

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