1. Courses

A. Semester Course Plan

Students complete a common foundation during the first two years and begin guided specialization in Semester V. Track-selective courses are identified by the suffix c and are governed by the selection rules and course tree below.

Curriculum Structure and Selection Rules

The program has a common foundation organized around four knowledge pillars: Computing and AI, Hardware and Embedded Systems, Sensing and Communications, and Intelligent Systems. Students choose one of three specialization tracks from Year 3: AI & Data Science, Autonomous & Intelligent Systems, or Communication, Photonics & Sensing. The suffix c identifies a track-selective course and forms part of the curriculum code.

Students must take the number of track-selective courses stated for each semester. After completing the anchor requirements, any remaining required track-selective courses may be chosen from other c-coded courses, subject to prerequisites and academic advising. To receive a named track on the transcript, a student must complete all anchor courses for that track shown below, take at least one technical elective aligned with the track, and complete the Capstone Project or Thesis in the same field. The program committee may approve an equivalent substitution when a course is unavailable. Students may otherwise combine courses across tracks and graduate without a named track.

Track Course Tree

Stage	AI & Data Science anchors	Autonomous & Intelligent Systems anchors	Communication, Photonics & Sensing anchors
Year 2 common foundation	AI; databases; machine learning; mathematics	AI; IoT; circuits; sensors; machine learning	Networks; electromagnetics; signals; circuits; introductory photonics
V	301c Data Science; 302c Visualization; 303c Predictive Analytics; 304c Optimization	305c Embedded Systems; 306c Computer Vision; 309c DSP	307c Fiber Optics; 308c Wireless Networks; 309c DSP
VI	351c Big Data; 352c AI Systems	352c AI Systems; 353c RTOS; 354c Wireless Communications and Sensor Nodes; 355c Control	354c Wireless Communications and Sensor Nodes; 356c Photonic Devices
VII	401c Advanced AI Applications	402c Robotics and Autonomous Systems	403c Microwave Engineering or 404c Optical Sensing

Course Tree and Prerequisite Guidance

Advanced course	Required prerequisite or foundation
Introduction to Machine Learning	Programming Fundamentals; Data Structures and Algorithms; Mathematics for Computing II
Big Data Technologies	Database Management Systems; Object Oriented Programming
AI System Design and Architecture	Introduction to Artificial Intelligence; Introduction to Machine Learning
Embedded Systems and Microcontrollers	Microprocessor and Computer Architecture; Basic Electronics and Elec. Eng.
Real Time Operating Systems	Embedded Systems and Microcontrollers
Digital Signal Processing	Introduction to Signals and Systems; Mathematics for Computing II
Control Systems	Introduction to Signals and Systems; Mathematics for Computing II
Robotics and Autonomous Systems	Embedded Systems; Control Systems; programming
Photonics and Optical Devices	Introduction to Photonics; Circuit Analysis and Design
Microwave Engineering	Engineering Electromagnetics
Optical Sensing and Imaging	Introduction to Photonics; Photonics and Optical Devices
Research Design and Proposal Development	Research Methods in Digital Technology
Thesis	Research Design and Proposal Development; approved proposal

General Education

The curriculum includes 12 credit hours of general education within the 130-credit program: Academic and Technical Communication, Technology Society Ethics and Law, Environment and Sustainable Development, and one approved humanities, social science, economics or public policy elective. The noncredit seminars supplement rather than replace these credit-bearing courses.

B. Courses by Semester

S.N.	Course Code	Course Title	Cr.
		Semester I	
1	DT-CR-101	Digital Logic and Computer Organization	3
2	DT-CR-102	Mathematics for Computing I Trigonometry Calculus and Linear Algebra	3
3	DT-CR-103	Programming Fundamentals	3
4	DT-CR-104	Basic Electrical and Electronics Engineering	3
5	DT-CR-105	Applied Physics Mechanics Optics and Electricity	3

S.N.	Course Code	Course Title	Cr.
6	DT-CR-106	Electrical and Electronics Workshop	2
7	DT-NC-107	Student Success and Personal Development	0
	Total		17
		Semester II	
1	DT-CR-151	Mathematics for Computing II Statistics Probability Calculus II and Numerical Methods	3
2	DT-CR-152	Object Oriented Programming	3
3	DT-CR-153	Discrete Mathematics	3
4	DT-CR-154	Microprocessor and Computer Architecture	3
5	DT-CR-155	Data Structures and Algorithms	3
6	DT-CR-156	Introduction to Signals and Systems	2
7	DT-NC-157	Community Engagement and Sustainability Practice	0
	Total		17
		Semester III Common Foundation	
1	DT-CR-201	Database Management Systems	3
2	DT-CR-202	Introduction to Artificial Intelligence	3
3	DT-CR-203	Computer Networks	3
4	DT-CR-204	Mathematics for Computing III, Probability and Statistics II	2
5	DT-CR-205	Engineering Electromagnetics	3
6	DT-CR-206	Research Methods in Digital Technology	2
7	DT-CR-207	Basic Sensors Interface and Hardware Workshop	2
8	DT-NC-208	Cyber Safety and Digital Citizenship	0
	Total		18
		Semester IV Common Foundation	
1	DT-CR-251	Introduction to Machine Learning	3
2	DT-CR-252	Internet of Things Architecture and Protocols	3
3	DT-CR-253	Cryptography and Blockchain	3
4	DT-CR-254	Introduction to Photonics	3
5	DT-CR-255	Circuit Analysis and Design	3
6	DT-CR-256	Integrative Project Team Based	2

S.N.	Course Code	Course Title	Cr.
7	DT-NC-257	Emerging Technologies Seminar	0
	Total		17

S.N.	Course Code	Course Title	Cr.
		Semester V Select 4 track-selective courses	
1	DT-CR-301c	Introduction to Data Science and Analytics	3
2	DT-CR-302c	Data Visualization	3
3	DT-CR-303c	Predictive Analytics and Forecasting	3
4	DT-CR-304c	Optimization Techniques for Data Science	3
5	DT-CR-305c	Embedded Systems and Microcontrollers	3
6	DT-CR-306c	Computer Vision and Perception	3
7	DT-CR-307c	Fiber Optic Communications	3
8	DT-CR-308c	Wireless Networks	3
9	DT-CR-309c	Digital Signal Processing	3
10	DT-GE-310	Academic and Technical Communication	3
11	DT-EL-(370-389)	Technical Elective I	3
	Total		18
		Semester VI Select 4 track-selective courses	
1	DT-CR-351c	Big Data Technologies	3
2	DT-CR-352c	AI System Design and Architecture	3
3	DT-CR-353c	Real Time Operating Systems	3
4	DT-CR-354c	Wireless Communications and Sensor Nodes	3
5	DT-CR-355c	Control Systems	3
6	DT-CR-356c	Photonics and Optical Devices	3
7	DT-GE-357	Technology Society Ethics and Law	3
8	DT-EL-(370-389)	Technical Elective II	3
	Total		18

S.N.	Course Code	Course Title	Cr.
		Semester VII Select 1 track-selective course	
1	DT-CR-401c	Advanced AI Applications	3
2	DT-CR-402c	Robotics and Autonomous Systems	3
3	DT-CR-403c	Microwave Engineering	3
4	DT-CR-404c	Optical Sensing and Imaging	3
5	DT-CR-405	Research Design and Proposal Development	3
6	DT-CR-406	Entrepreneurship Leadership and Technology Innovation	3
7	DT-GE-407	Environment and Sustainable Development	3
8	DT-GE-408	Humanities Social Science Economics or Public Policy Elective	3
9	DT-CR-409	Capstone Project	2
10	DT-CR-410	Conference Seminar and Guest Lectures	1
	Total		18
		Semester VIII	
1	DT-CR-451	Thesis	4
2	DT-CR-452	Industry Internship	3
	Total		7

Grand Total Credit: 130