Kerala University of Digital Sciences, Innovation and Technology

M.Tech Computer Science and Engineering

&

M.Sc Computer Science

2024 Admission onwards

School of Computer Science and Engineering
(SoCSE)

School of Computer Science and Engineering

The School of Computer Science and Engineering (SoCSE) of the Kerala University of Digital Sciences, Innovation, and Technology (KUDSIT) was established in 2020 at the Technopark Phase IV, Thiruvananthapuram. The School offers the academic programmes M.Tech Computer Science and Engineering, M.Sc Computer Science, and PhD.

Master of Technology (M.Tech) in Computer Science and Engineering

M.Tech in Computer Science and Engineering has three specializations: Artificial Intelligence, Connected Systems and Intelligence, and Cyber Security Engineering. The students must choose one of the specializations in the second semester. The admission and eligibility requirements for all three specializations are the same.

Master of Science (M.Sc) in Computer Science

M.Sc in Computer Science has two specializations: Cyber Security and Machine Intelligence. The students must choose one of the specializations while taking admission. The admission and eligibility requirements for both specializations are the same.

Programme Structure

The Minimum credit requirement for the award of the Two Years Masters programme will be 80 credits. However, the student may be allowed to opt for upto 90 credits through additional courses/projects.

One credit is defined as 1 hr of contact (lectures/tutorials) per week or 2 hrs of student workload (labs, projects, homework) per week. As there will be 15 teaching weeks in a semester, 1 credit is equated to 15 hours of contact classes per semester or 30 hours of student workload per semester.

A post graduate degree programme can be completed in a minimum period of 24 months and a maximum period of 48 months. This can include a zero-year recommended by the academic committee and approved by the Vice Chancellor of the University as per the Post Graduate Regulations, 2024 (KUDSIT-PG Regulations 2024).

The credit distribution requirements across various types of courses:

Programme courses (45 credits)			**University courses (15 credits)**		**Final year Projects (20 credits)**	**Additional credits beyond mandatory course work and project**
Programme Core (Mandatory)	Programme electives (Mandatory)	Open electives (Mandatory)	University Core	University Elective	Capstone Project/ Thesis (Mandatory)	Additional courses (Optional)
			Digital Access for Community Empowerment - DACE (Mandatory)	Holistic Development (Mandatory)		
18 credits	15 credits	12 credits	6 credits	9 credits	20 credits	10 credits

The semester-wise breakup of credit requirements across various types of courses

Year-wise course levels & credit distribution	**Semester**	**University Core (500 level)**	**Programme Core/Programme Elective/Open Elective 400/500 level**	**Capstone Project/ Thesis 500 level**	**Holistic Development 500 level**	**Minimum credits required**	**Maximum allowable credits**
1st year 400 level courses-24 credits + 500 level courses- 16 credits	S1	3 credits	15- 19 credits	0 credit	2 credits	20 credits	24 credits
	S2	3 credits	15- 19 credits	0 credit	2 credits	20 credits	24 credits
2nd year 500 level courses/project/ thesis- 40 credits	S3	0	15- 19 credits	0-4 credits	5 credits	20 credits	24 credits
	S4	0	0 - 4 credits	20 credits	0 credits	20 credits	24 credits

Credit Requirements for the Master Programme

A. The students are allowed to take a maximum of 24 Credits (inclusive of both audit & credits courses) in a semester. However, this credit limit restriction may be exempted for accommodating the repeat attempt of the failed courses.
B. The minimum aggregate of attendance during a semester shall be 75%. This is not applicable to project-based courses, fieldwork-based courses, and research works done outside the university. Any exemptions shall be defined by the course lecturers in the course description document.
C. Students must earn a minimum of 24 credits in 400-level courses and at least 56 credits in 500-level courses.
D. The students are allowed to take a maximum of 12 Credits through audit courses. These credits do not count toward the total credits for the programme.
E. The students are allowed to obtain a maximum of 12 Credits through challenge exams. These credits count towards total credits for the programme.
F. At least 35 credits (programme electives + project/thesis) are required for a major specialization and 9 credits (defined streams of specialization as specified through open electives in programme outline) for minor specialization (equivalent to three 3 credit courses or equivalent). The specialization credits consist of projects, courses, activities etc.
G. Up to 16 credits may be obtained through SWAYAM or other online courses approved by the school (Programme Elective/Open Elective/Holistic Development). However, a maximum of 9 credits can be earned as Programme Elective through this mode.
H. Individual/Group Mini-projects are allowed as programme electives/open electives. However, a maximum of 15 credits may be allowed in this mode. Mini Projects are allowed for research explorations/practical implementations in a specialized subject area relevant to the specialization in the masters programme.

Mode of Instructions

A wide variety of modern teaching and learning methods are expected to be used in the delivery of the courses.

Course Level	Teaching	Evaluations
400 level	Lecture courses with practicum, seminar-based courses, term papers, research methodology, advanced laboratory experiments/software training, research projects, hands-on-training, internship/apprenticeship projects	As per the University Examination Manual and as decided by the Controller of the Examinations of the University.

500 level	Original study or investigation in a major field of specialization, by an individual or a group	As per the University Examination Manual and as decided by the Controller of the Examinations of the University.

Pass Criteria

As stipulated in the University Examination Manual.

M.Tech in Computer Science and Engineering with Specialization in Artificial Intelligence/Connected Systems and Intelligence/Cyber Security Engineering (AY 2024-25 Onwards)

Semester 1				
Course Code	**Title of the Course**	**Credits**	**Credit Split Lecture/Lab/ Seminar/Project**	**Level**
M5010000	Digital Access for Community Empowerment I	3		500
M4010000/ M4010001	AI and Machine Learning/ Introduction to Cyber Security	4	3-1-0-0	400
M4010002	Advanced Data Structures and Algorithms	3	2-1-0-0	400
	Open Elective	3 or 4		
M4010003	Mathematics	3	3-0-0-0	400
M4010004	Programming in Python	2	1-1-0-0	400
	Holistic Development (HD-1)	2		500
Total Credits		20		

Semester 2				
Course Code	**Title of the Course**	**Credits**	**Credit Split Lecture/Lab/ Seminar/Project**	**Level**
M5010001	Digital Access for Community Empowerment II	3		500
M4010005/ M4010006	Advanced Distributed Systems/Data and Intelligence	3	2-0-1-0	400
M4010007/ M4010008	Data Analytics/Computer Networks and Security	3	2-1-0-0	400
	Programme/Open Elective	9		400/500
	Holistic Development (HD-2)	2		500
Total Credits		20		

Semester 3				
Course Code	**Title of the Course**	**Credits**	**Credit Split Lecture/Lab/ Seminar/Project**	**Level**
	Programme/Open Elective	15		500
	Holistic Development (HD-3)	5		500
Total Credits		20		

Semester 4				
Course Code	**Title of the Course**	**Credits**	**Credit Split Lecture/Lab/ Seminar/Project**	**Level**
M5010002	Thesis	20	0-0-0-20	500
Total Credits		20		

Programme Electives for Artificial Intelligence (Minimum 15 Credits Required)				
Course Code	**Title of the Course**	**Credits**	**Credit Split Lecture/Lab/ Seminar/Project**	**Level**
M4010009	Robotics	3	2-1-0-0	400
M4010010	Deep Learning	3	2-1-0-0	400
M4010011	Natural Language Processing	3	2-1-0-0	400
M5010004	Stochastic Processes and Models	3	1-1-0-1	500
M5010005	Digital Image and Video Processing	3	1-1-0-1	500
M5010006	Reinforcement Learning	3	1-1-0-1	500
M5010007	Computer Vision	3	1-1-0-1	500
M5010008	Soft Computing	3	1-1-0-1	500
M5010009	Speech Processing	3	1-1-0-1	500
M5010010	Cognitive Computing	3	1-1-0-1	500
M5010011	Big Data Technologies	3	1-1-0-1	500
M5010012	Optimization Techniques	3	1-1-0-1	500
M5010030	Federated Learning	3	1-1-0-1	500
	Approved Swayam Courses			
	Individual/Group Mini-projects			

Programme Electives for Cyber Security Engineering (Minimum 15 Credits Required)				
Course Code	**Title of the Course**	**Credits**	**Credit Split Lecture/Lab/Seminar/Project**	**Level**
M4010012	Cryptography	3	1-1-0-1	400
M4010013	Hardware Security	3	2-1-0-0	400
M4010014	Ethical Hacking and Penetration Testing	3	2-1-0-0	400
M4010015	Digital Forensics	3	1-1-0-1	400
M5010013	Cloud Security	3	1-1-0-1	500
M5010014	IoT Networks and Endpoint Security	3	1-1-0-1	500
M5010015	Systems Security and Risk Analysis	3	1-1-0-1	500
M5010016	Cyber Analytics	3	1-1-0-1	500
M5010017	Malware Analysis and Reverse Engineering	3	1-1-0-1	500
M5010018	AI for Cyber Security	3	1-1-0-1	500
M5010020	Database Security	3	1-1-0-1	500
M5010021	Mobile Application Security	3	1-1-0-1	500
M5010022	Information Security Management System	3	1-1-0-1	500
	Approved Swayam Courses			
	Individual/Group Mini-projects			

Programme Electives for Connected Systems and Intelligence (Minimum 15 Credits Required)				
Course Code	**Title of the Course**	**Credits**	**Credit Split Lecture/Lab/ Seminar/Project**	**Level**
M4010012	Cryptography	3	1-1-0-1	400
M4010013	Hardware Security	3	2-1-0-0	400
M4010016	Software Defined Networking	3	2-1-0-0	400
M5010013	Cloud Security	3	1-1-0-1	500
M5010014	IoT Networks and Endpoint Security	3	1-1-0-1	500
M5010015	Systems Security and Risk Analysis	3	1-1-0-1	500
M5010023	Social Network Analytics and Security	3	1-1-0-1	500
M5010024	Wireless Sensor Networks	3	1-1-0-1	500
M5010025	Connected Environments and Enabling Technologies	3	1-1-0-1	500
	Approved Swayam Courses			
	Individual/Group Mini-projects			

M. Sc. in Computer Science with Specialization in Cyber Security/Machine Intelligence (AY 2024-25 Onwards)

Semester 1				
Course Code	**Title of the Course**	**Credits**	**Credit Split Lecture/Lab/ Seminar/Project**	**Level**
M5020000	Digital Access for Community Empowerment I	3		500
M4020000/ M4020001	AI and Machine Learning/Introduction to Cyber Security	4	3-1-0-0	400
M4020002/ M4020005	Advanced Data Structures and Algorithms / Data Structures and Algorithms	3	2-1-0-0	400
M4020006	Database Systems	3	2-1-0-0	400
M4020003	Mathematics	3	3-0-0-0	400
M4020004	Programming in Python	2	1-1-0-0	400
	Holistic Development (HD-1)	2		500
Total Credits		20		

Semester 2				
Course Code	**Title of the Course**	**Credits**	**Credit Split Lecture/Lab/ Seminar/Project**	**Level**
M5020001	Digital Access for Community Empowerment II	3		500
M4020007/ M4020008	Data Analytics/Computer Networks and Security	3	2-1-0-0	400
	Programme / Open Elective	12		400/500
	Holistic Development (HD-2)	2		500
Total Credits		20		

Semester 3				
Course Code	**Title of the Course**	**Credits**	**Credit Split Lecture/Lab/ Seminar/Project**	**Level**
	Programme / Open Elective	15		500
	Holistic Development (HD-3)	5		500
Total Credits		20		

Semester 4				
Course Code	**Title of the Course**	**Credits**	**Credit Split Lecture/Lab/ Seminar/Project**	**Level**
M5020002	Project	20	0-0-0-20	500
Total Credits		20		

Programme Electives for Machine Intelligence (Minimum 15 Credits Required)				
Course Code	**Title of the Course**	**Credits**	**Credit Split Lecture/Lab/ Seminar/Project**	**Level**
M4020009	Robotics	3	2-1-0-0	400
M4020010	Deep Learning	3	2-1-0-0	400
M4020011	Natural Language Processing	3	2-1-0-0	400
M4020016	Data and Intelligence	3	2-0-1-0	400
M5020004	Stochastic Processes and Models	3	1-1-0-1	500
M5020005	Digital Image and Video Processing	3	1-1-0-1	500
M5020006	Reinforcement Learning	3	1-1-0-1	500
M5020007	Computer Vision	3	1-1-0-1	500
M5020008	Soft Computing	3	1-1-0-1	500
M5020009	Speech Processing	3	1-1-0-1	500
M5020010	Cognitive Computing	3	1-1-0-1	500
M5020011	Big Data Technologies	3	1-1-0-1	500
M5020012	Optimization Techniques	3	1-1-0-1	500
M5020030	Federated Learning	3	1-1-0-1	500
	Approved Swayam Courses			
	Individual/Group Mini-projects			

Programme Electives for Cyber Security (Minimum 15 Credits Required)				
Course Code	**Title of the Course**	**Credits**	**Credit Split Lecture/Lab/ Seminar/Project**	**Level**
M4020012	Cryptography	3	1-1-0-1	400
M4020013	Hardware Security	3	2-1-0-0	400
M4020014	Ethical Hacking and Penetration Testing	3	2-1-0-0	400
M4020015	Digital Forensics	3	1-1-0-1	400
M5020013	Cloud Security	3	1-1-0-1	500
M5020014	IoT Networks and Endpoint Security	3	1-1-0-1	500
M5020015	Systems Security and Risk Analysis	3	1-1-0-1	500
M5020016	Cyber Analytics	3	1-1-0-1	500
M5020017	Malware Analysis and Reverse Engineering	3	1-1-0-1	500
M5020018	AI for Cyber Security	3	1-1-0-1	500
M5020020	Database Security	3	1-1-0-1	500
M5020021	Mobile Application Security	3	1-1-0-1	500
M5020022	Information Security Management System	3	1-1-0-1	500
	Approved Swayam Courses			
	Individual/Group Mini-projects			

Open Electives offered by SoCSE				
Course Code M. Tech/M. Sc	**Title of the Course**	**Credits**	**Credit Split Lecture/Lab/ Seminar/Project**	**Level**
M4010017/ M4020017	Technical Communication	2	1-1-0-0	400
M4020018	Operating Systems	3	2-1-0-0	400
M4020019	Computer Architecture	3	2-1-0-0	400
M5020023	Web Technology	3	1-1-0-1	500
M5020024	OOPS and JAVA	3	1-1-0-1	500
M5020025	Object Oriented Software Engineering	3	1-1-0-1	500
M5010026/ M5020026	Blockchain Technology	3	1-1-0-1	500
M5010027/ M5020027	Augmented and Virtual Reality	3	1-1-0-1	500
M5010028/ M5020028	Quantum Computing	3	1-1-0-1	500
M5010029/ M5020029	Cloud and Edge Computing	3	1-1-0-1	500
	Approved SWAYAM Courses			
	Individual/Group Mini-projects			
M5010003/ M5020003	Project/Thesis in AI/Cyber Security Engineering/Connected Systems and Intelligence	9	0-0-0-9	500