

## KERALA UNIVERSITY OF DIGITAL SCIENCES, INNOVATION AND TECHNOLOGY (DIGITAL UNIVERSITY OF KERALA)

### MSc in Computer Science with Specialization in Software Systems Engineering

Software Systems Engineers use computing to solve real-world problems. They take on different roles such as software architects, analysts, designers, developers, testers, consultants, and project managers. This specialization offered by the School of CSE, DUK aims to prepare students to assess software requirements, design, develop, and test software systems, plan and manage software projects, and solve technical challenges by applying computational theories.

The programme's curriculum includes lectures, laboratory works, student seminars, individual and group assignments, individual and group projects, internal tests, end-semester examinations, industrial seminars & workshops, internships and final research/industry project & dissertation. The University's collaboration with local software companies at Technopark, Technocity, Infopark and Smart City facilitates students to do their projects & internships in software industry and get hands-on experience in real-life projects.

The programme is designed to prepare students to get placements in global software companies as software engineers, software architects, technical/project leaders and project coordinators/managers. Students have the opportunity to get placed in the companies they have engaged with for their internships and projects. The programme also provides a foundation for further doctoral research and a career in academia.

<b>Semester 1</b>				
Course Code	Title of the Course	Credits	Credit Split Lecture/Lab/ Seminar/Project	Level
M302001	Digital Experience Laboratory	4	1-3-0-0	300
University Core	Design Thinking and Innovation	3	3-0-0-0	300
M202103	Data Structures and Algorithms	4	3-1-0-0	200
M202101	Mathematics for Computer Science	3	3-0-0-0	200
-	Programming for Problem Solving	4	2-2-0-0	200
-	Fundamentals of Software Engineering	4	3-0-1-0	200
M102105	Python for Data Science	3	3-0-0-0	100
M102107	Python Programming Lab	1	0-1-0-0	100
Total Credits		26		

<b>Semester 2</b>				
Course Code	Title of the Course	Credits	Credit Split Lecture/Lab/ Seminar/Project	Level
University Core	Digital Access for Community Empowerment	3	0-0-0-3	300
M202202	Database Systems	4	3-1-0-0	200
M202203	Operating Systems	3	3-0-0-0	200

M302324	Web Technology	4	3-1-0-0	300
-	Management of Software Systems	4	2-0-1-0	300
	Elective 1	4		300
	M.Sc Mini Project 1	1	0-0-0-1	300
Total Credits		23		

Electives for Semester 2				
Course Code	Title of the Course	Credits	Credit Split Lecture/Lab/ Seminar/Project	Level
-	Mobile Application Development	4	2-2-0-0	300
M301262	Social Network Analytics and Security	4	3-0-0-1	300
M301254	Network and System Security	4	3-1-0-0	300
M302225	Information Retrieval	4	3-0-0-1	300

Semester 2 Internship				
Course Code	Title of the Course	Credits	Credit Split Lecture/Lab/ Seminar/Project	Level
Internship	M.Sc Summer Internship/Team Project	2	0-0-0-2	300
Total Credits		2		

Semester 3				
Course Code	Title of the Course	Credits	Credit Split Lecture/Lab/ Seminar/Project	Level
M301213	Cloud and Edge Computing	4	3-0-0-1	300
M302363	Secure Software Engineering	3	3-0-0-0	300
	Elective 2	4		300
	Elective 3	4		300
	Elective 4	4		300
M302307	IoT Experience Lab	2	0-1-0-0	200
	M.Sc Mini Project 2	3	0-0-0-3	300
	Industrial Seminars	1	0-0-1-0	200
Total Credits		25		

Electives for Semester 3				
Course Code	Title of the Course	Credits	Credit Split Lecture/Lab/ Seminar/Project	Level
M301135	Blockchain Technologies	4	3-1-0-0	300
M302216	Computer Vision	4	3-0-0-1	300
M301212	Data Mining and Big Data	4	3-0-0-1	300
M301115	Natural Language Processing	4	3-0-0-1	300
M301222	Human-computer Interaction	4	3-0-0-1	300
M302112	Machine Learning	4	3-0-0-1	300
-	Software Project Management	4	3-0-0-1	300
-	Advanced Software Testing	4	2-2-0-1	300
-	Software Quality Assurance	4	3-0-0-1	300
-	Software Architecture	4	3-0-0-1	300

-	Entrepreneurship	4	3-0-1-0	300
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<b>Semester 4</b>				
Course Code	Title of the Course	Credits	Credit Split Lecture/Lab/ Seminar/Project	Level
	M.Sc Internship/Project	24	0-0-0-24	400
<b>Total Credits</b>		24		

<b>Audit courses (NPTEL)</b>	
1. Advanced Computer Architecture	13. Introduction to Industry 4.0 and Industrial Internet of Things
2. Algorithms for Big Data	14. Introduction to Soft Computing
3. Applied Natural Language Processing	15. Mobile Computing
4. Blockchain and its Applications	16. Modern Application Development
5. Data Mining	17. Operating System Fundamentals
6. Deep Learning	18. Practical Machine Learning with Tensorflow
7. Design and Engineering of Computer Systems	19. Randomized Methods in Complexity
8. Foundations of Cryptography	20. Reinforcement Learning
9. Foundations to Computer Systems Design	21. Systems and Usable Security
10. Google Cloud Computing Foundation Course	22. VLSI Design Verification and Test
11. GPU Architectures and Programming	
12. Human-Computer Interaction	