



Post Graduate Programme Curriculum

School of Digital Sciences

**Kerala University of Digital Sciences, Innovation and
Technology**

Technocity Campus, Mangalapuram, Thiruvananthapuram, India

-2024-

Academics

School of Digital Sciences currently offers the following programs in the academic year 2024-25

- MSc in Computer Science with Specialization in Data Analytics
- MSc in Data Analytics & Computational Science
- MSc in Data Analytics & Geoinformatics
- MSc in Data Analytics & BioAI

Course outline

The programme will consist of a set of core courses, electives, mini projects, Internship/Major project, activities as well as one university core course. Details of the credit distribution is given below:

Credit distribution of the MSc programmes offered by School of Digital Sciences

| Program courses (30 credits) | | University courses (20 credits) | | Final year Projects | Additional credits beyond mandatory coursework and project | | |
|------------------------------------|---|---------------------------------------|--------------------------------------|--|--|---------------------------------------|---|
| Program Core (Mandatory) | Program electives (Mandatory) | University Core (Mandatory) | Open electives (Mandatory) | Capstone Project/ Thesis (Mandatory) | Activity credits (Mandatory) | Activity credits (Optional) | Additional courses (Optional) |
| 15 credits | 15 credits | 5 credits | 15 credits | 15 credits | 5 credits | 5credits | 5 credits |

Course Categorization

- 100 Level - Undergraduate level basic course
- 200 Level - Undergraduate level advance course
- 300 Level - Postgraduate level instruction based course
- 400 Level - Postgraduate level seminar/ research level course
- 500 Level - Research level course

Curriculum of MSc Programs offered by SoDS

Semester-wise split of the category of all programs

Semester I

| Course Code | Title of the course | Credits |
|-------------|---|-----------|
| | University core | 3 |
| | Programme Core | 9 |
| | Programme elective | 3 |
| | Scientific Writing & Communication (Activity) | 2 |
| | Total | 17 |

Semester II

| Course Code | Title of the course | Credits |
|-------------|---|-----------|
| | University core | 2 |
| | Open Elective | 6 |
| | Programme Core | 6 |
| | Programme elective | 3 |
| | Industry readiness programme (Activity) | 2 |
| M3220260 | Mini project (OE) | 1 |
| | Total | 20 |

Semester III

| Course Code | Title of the course | Credits |
|-------------|---|-----------|
| | Open Elective | 6 |
| | Programme elective | 9 |
| | Industry readiness programme (Activity) | 1 |
| M3220360 | Mini project (OE) | 2 |
| | Total | 18 |

Semester IV

| Course Code | Title of the course | Credits |
|-------------|---------------------|-----------|
| M4220451 | Internship/Thesis | 15 |
| | Total | 15 |

Core Courses for each of the programmes

MSc Computer Science with Specialization in Data Analytics

| Course Code | Title of the course | Credits | Level | Credit Split Lecture-Lab- Seminar-Project |
|-------------|--|---------|-------|---|
| M3220151 | Introduction to Computer Science (Sem I) | 3 | 300 | 2-0-1-0 |
| M3220152 | Database Systems (Sem I) | 3 | 300 | 1-2-0-0 |
| M3220153 | Data Analytics (Sem I) | 3 | 300 | 1-1-0-1 |
| M3220251 | Predictive Analytics (Sem II) | 3 | 300 | 1-1-0-1 |
| M3220252 | Web Technology (Sem II) | 3 | 300 | 1-1-0-1 |

MSc Data Analytics & Computational Science

| Course Code | Title of the course | Credits | Level | Credit Split Lecture-Lab- Seminar-Project |
|-------------|---|---------|-------|---|
| M3220151 | Introduction to Computer Science (Sem I) | 3 | 300 | 2-0-1-0 |
| M3220153 | Data Analytics (Sem I) | 3 | 300 | 1-1-0-1 |
| M3220154 | Introduction to Computational Science (Sem I) | 3 | 300 | 2-1-0-0 |

| | | | | |
|----------|-------------------------------|---|-----|---------|
| M3220251 | Predictive Analytics (Sem II) | 3 | 300 | 1-1-0-1 |
| M3220253 | Numerical Methods (Sem II) | 3 | 300 | 1-1-0-1 |

MSc Data Analytics & BioAI

| Course Code | Title of the course | Credits | Level | Credit Split Lecture-Lab- Seminar-Project |
|--------------------|--------------------------------------|----------------|--------------|--|
| M3220153 | Data Analytics (Sem I) | 3 | 300 | 1-1-0-1 |
| M3220155 | Molecular Biology (Sem I) | 3 | 300 | 2-0-1-0 |
| M3220156 | Bioinformatics (Sem I) | 3 | 300 | 1-1-1-0 |
| M3220251 | Predictive Analytics (Sem II) | 3 | 300 | 1-1-0-1 |
| M3220254 | NGS & Genome Data Analytics (Sem II) | 3 | 300 | 1-1-0-1 |

MSc Data Analytics & Geoinformatics

| Course Code | Title of the course | Credits | Level | Credit Split Lecture-Lab- Seminar-Project |
|--------------------|--|----------------|--------------|--|
| M3220153 | Data Analytics (Sem I) | 3 | 300 | 1-1-0-1 |
| M3220157 | Geographic Information System (Sem I) | 3 | 300 | 2-1-0-0 |
| M3220158 | Remote sensing and earth observation (Sem I) | 3 | 300 | 2-1-0-0 |
| M3220251 | Predictive Analytics (Sem I) | 3 | 300 | 1-1-0-1 |

| | | | | |
|----------|--|---|-----|---------|
| | II) | | | |
| M3220255 | Advanced Geospatial Analytics (Sem II) | 3 | 300 | 1-1-0-1 |

Courses offered as electives

Students can opt for electives from the following list in the first/second or third semester based on the recommendations of the mentor/course coordinator. The School will decide the list of electives to be offered each semester based on requirements from students and availability of faculty.

List of Elective courses offered by School of Digital Sciences

| Course Code | Title of the course | Credits | Programs | Level | Credit Split Lecture- Lab- Seminar- Project | Semester at which the course may be offered |
|-------------|--|---------|---------------------------------------|-------|---|---|
| M3220252 | Web Technology | 3 | Computational /Bio AI/ Geoinformatics | 300 | 1-1-0-1 | 2 nd /3 rd sem |
| M3221151 | Programming with Python | 3 | All programs | 300 | 1-1-0-1 | 1 st / 2 nd sem |
| M3222251 | Cloud Computing | 3 | All programs | 300 | 1-1-0-1 | 2 nd /3 rd sem |
| M3221252 | Natural Language Processing | 3 | All programs | 300 | 1-1-0-1 | 2 nd /3 rd sem |
| M3221253 | Information Retrieval | 3 | All programs | 300 | 1-1-0-1 | 2 nd /3 rd sem |
| M3221254 | Anomaly detection & Fraud Analytics | 3 | All programs | 300 | 1-1-0-1 | 2 nd /3 rd sem |
| M3221255 | Social Network Analysis & Semantic Web | 3 | All programs | 300 | 1-1-0-1 | 2 nd /3 rd sem |

| | | | | | | |
|----------|--|---|---|-----|---------|--------------------------------------|
| M3221256 | Generative AI | 3 | All programs | 300 | 1-1-1-0 | 2 nd /3 rd sem |
| M3221257 | Time series analysis & SEM Modelling | 3 | Computer Science/ Computational Science | 300 | 1-1-0-1 | 2 nd /3 rd sem |
| M3221258 | Healthcare Analytics | 3 | BioAI | 300 | 1-1-0-1 | 2 nd /3 rd sem |
| M3221259 | Deep learning & MLOps | 3 | All programs | 300 | 1-1-0-1 | 2 nd /3 rd sem |
| M3221260 | Advanced Programming | 3 | All programs | 300 | 1-1-0-1 | 2 nd /3 rd sem |
| M3221261 | Advanced Geospatial Programming | 3 | Geoinformatics | 300 | 1-1-0-1 | 2 nd /3 rd sem |
| M3221262 | Advanced Machine Learning | 3 | All programs | 300 | 1-1-0-1 | 2 nd /3 rd sem |
| M3221263 | Spatial Data Analytics | 3 | Computer Science/Geoinformatics | 300 | 1-1-0-1 | 2 nd /3 rd sem |
| M3221264 | Thermal and Hyperspectral remote sensing | 3 | Geoinformatics | 300 | 1-0-1-1 | 2 nd /3 rd sem |
| M3221265 | Microwave remote sensing | 3 | Geoinformatics | 300 | 1-0-1-1 | 2 nd /3 rd sem |
| M3221266 | Spatial Bigdata Analytics | 3 | Geoinformatics | 300 | 1-1-0-1 | 2 nd /3 rd sem |
| M3221267 | Web and Mobile GIS | 3 | Geoinformatics | 300 | 1-1-0-1 | 2 nd /3 rd sem |

| | | | | | | |
|----------|--|---|-----------------------------|-----|---------|--------------------------------------|
| M3221268 | Topographic Data Analysis Techniques and Applications | 3 | Geoinformatics | 300 | 1-1-0-1 | 2 nd /3 rd sem |
| M3221269 | Geospatial Applications in Agriculture | 3 | Geoinformatics | 300 | 1-1-0-1 | 2 nd /3 rd sem |
| M3221270 | Computational Chemistry | 3 | Computational science/BioAI | 300 | 1-1-0-1 | 2 nd /3 rd sem |
| M3221271 | Computational Neuroscience | 3 | Computational science/BioAI | 300 | 2-0-0-1 | 2 nd /3 rd sem |
| M3221272 | Geospatial Applications for Environment and Climate change | 3 | Geoinformatics | 300 | 2-0-0-1 | 2 nd /3 rd sem |
| M3221273 | Geospatial Applications for Hydrological Modeling | 3 | Geoinformatics | 300 | 1-1-0-1 | 2 nd /3 rd sem |
| M3221274 | Geospatial Applications in Urban and Regional Planning | 3 | Geoinformatics | 300 | 2-0-0-1 | 2 nd /3 rd sem |
| M3221275 | AI applications in agriculture | 3 | BioAI | 300 | 1-1-0-1 | 2 nd /3 rd sem |
| M3221276 | Computational Finance | 3 | Computational Science | 300 | 1-1-0-1 | 2 nd /3 rd sem |
| M3221277 | Structural Biology and Drug Design | 3 | BioAI | 300 | 1-1-0-1 | 2 nd /3 rd sem |

| | | | | | | |
|----------|-------------------------------|---|--|-----|---------|--------------------------------------|
| M3221278 | Parallel and GPU programming | 3 | Computer Science/ Computational Sciences | 300 | 1-1-1-0 | 2 nd /3 rd sem |
| M3221279 | Ethics in Data | 3 | All programs | 300 | 1-0-2-0 | 2 nd /3 rd sem |
| M3221280 | Data Security | 3 | All programs | 300 | 1-1-0-1 | 2 nd /3 rd sem |
| M3221281 | Data Engineering | 3 | All programs | 300 | 1-1-0-1 | 2 nd /3 rd sem |
| M3221152 | Differential Equations | 3 | Computational science | 300 | 1-1-1-0 | 1 st /2 nd Sem |
| M3221282 | Numerical Linear Algebra | 3 | Computational Science | 300 | 1-1-1-0 | 2 nd /3 rd sem |
| M3221283 | Data Structures and Algorithm | 3 | All programs | 300 | 1-1-0-1 | 2 nd /3 rd sem |
| M3221284 | Functional Genomics | 3 | BioAI | 300 | 2-0-0-1 | 2 nd /3 rd Sem |
| M3221285 | Advanced Healthcare Analytics | 3 | BioAI | 300 | 2-1-0-0 | 3 rd Sem |

- Student may opt for any course offered by other schools/same school as open electives.
- Activities include mini projects/group projects/NSS/paper publications/product development etc.

