MOHAMED BIN ZAYED
UNIVERSITY OF
ARTIFICIAL INTELLIGENCE

MBZUAI
University Catalogue
2023-2024

mbzuai.ac.ae

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114 AI702: Deep Learning (4CR)
114 CS701: Advanced Algorithms (4CR)
114 CS702: Theory of Computer Science (4CR)
115 CS703: Operating Systems (4CR)
115 CS704: Programming Languages and Implementation (4CR)
115 CS705: Distributed and Parallel Systems (4CR)
115 CS799: Computer Science Master's Research Thesis (8CR)
115 CS801: Advanced Complexity (4CR)
116 CS802: Advanced Data Structures (4CR)
116 CS803: Randomized Algorithms (4CR)
116 CS804: Combinatorial Optimization (4CR)
116 CS899: Computer Science Ph.D. Research Thesis (32CR)
116 CV701: Human and Computer Vision (4CR)
117 CV702: Geometry for Computer Vision (4CR)
117 CV703: Visual Objec Recognition and Detection (4CR)
117 CV707: Digital Twins (4CR)
117 CV799: Computer Vision Master's Research (8CR)
118 CV801: Advanced Computer Vision (4CR)
118 CV802: Advanced 3D Computer Vision 4CR)

118 CV803: Advanced Techniques in Visual Object Recognition and Detection (4CR)
119 CV804: 3D Geometry Processing (4CR)
119 CV805: Life-long Learning Agents for Vision (4CR)
119 CV899: Computer Vision Ph.D. Research Thesis (32CR)
119 DS701: Data Mining (4CR)
120 DS702: Big Data Processing(4CR)
120 DS703: Information Retrieval (4CR)
120 DS704: Statistical Aspect of Machine Learning / Statistical Theory (4CR)
120 HC701: Medical Imaging: Physics and Analysis (4CR)
121 INT799: Master of Science Internship (2CR)
121 INT899: Ph.D. Internship (2CR)
121 ML701: Machine Learning (4CR)
121 ML 703: Probabilistic and Statistical Inference (4CR)
122 ML 707: Smart City Services and Applications (4CR)
122 ML708: Trustworthy Artificial Intelligence (4CR)
122 ML709: IoT of things, Services and Applications (4CR)
122 ML710: Parallel and Distributed Machine Learning System (4CR)
123 ML799: Machine Learning Master's Research Thesis (8CR)
123 ML801: Foundations and Advanced Topics in Machine Learning (4CR)
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125 ML 812: Advanced Topics in Algorithms for Big Data (4CR)
125 ML899: Machine Learning Ph.D. Research Thesis (32CR)
125 MTH701: Mathematical Foundations of Artificial Intelligence (4CR)
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126 MTH703: Mathematics for Theoretical Computer Science (4CR)
126 NLP701: Natural Language Processing (4CR)
126 NLP702: Advanced Natural Language Processing (4CR)
126 NLP703: Speech Processing(4CR)
127 NLP799: NLP799 Natural Language Processing Master Research Thesis (8CR)
127 NLP801: Deep Learning for Language Processing (4CR)
127 NLP802: Current Topics in Natural Language Processing (4CR)
127 NLP803: Advanced Speech Processing (4CR)
127 NLP804 Deep Learning for Natural Language Generation (4CR)
128 NLP899: Natural Language Processing Ph.D. Research Thesis (32CR)
128 RES799: Introduction to Research Methods (2CR)
128 RES899: Advanced Research Methods (2CR)
128 ROB701: Introduction to Robotics (4CR)
129 ROB702: Robotic Vision and Intelligence (4CR)
129 ROB703: Robot Localization and Navigation (4CR)
129 ROB799: Robotics M.Sc. Research Thesis (8CR)
129 ROB801: Advanced Robotic Motion Planning (4CR)
130 ROB802: Advanced Topics in Robotics: Multi-Robot Systems (4CR)
130 ROB803: Advanced Humanoid Robotics (4CR)
130 ROB804: Vision for Autonomous Robotics (4CR)
130 ROB899: Robotics Ph.D. Research Thesis (32CR)

131 Appendix 2: Definitions

133 Appendix 3: Faculty

Welcome from the President

Welcome to Mohamed bin Zayed University of Artificial Intelligence (MBZUAI), a graduate research university dedicated to AI and AI natives. Your journey with us is going to be no less than extraordinary: you will pursue curiosity-driven research and develop a problem-solving mindset; work alongside some of the brightest minds in AI; and have the opportunity to make a lasting impact on society and humanity.

Located in Abu Dhabi, MBZUAI was founded in 2019 and is the product of the visionary leadership of the UAE, a country committed to solving the world's most pressing challenges with the power of AI. We have an important responsibility to seed a culture of research and innovation in the region to produce AI talents and lead the world in unleashing the full potential of AI through transformative research, diversity in thought and scientific discovery.

We are home to an outstanding faculty in computer vision, machine learning, natural language processing, robotics and computer science, with two more departments being added this year. Our curriculum has been designed to align your learning experience with real-life issues and prepares you to use your knowledge and skills to make a difference – whether you choose to stay in research or apply your learning in industry.

What we expect from you

AI is reshaping our lives and the world that we live in at a rapid pace. Be curious about how you can promote understanding of AI as a force for good and make a difference in the world. Your time here should be used to work toward that goal.

I encourage you to challenge existing norms, think creatively, and embrace feedback.

What you can expect from us

At MBZUAI, you will have unparalleled access to tools and resources that give you the freedom to remain curious and hone your research skills. You will be trained by top faculty in a safe and nurturing environment.

Like the great scientific revolutions before us – the steam engine, electricity and the internet – we are helping write the story of what comes next. And you are now part of that story.

Sincerely,

Professor Eric Xing
President, MBZUAI

Academic calendar 2023-2024

	Day	Date	Event
Fall semester (2023)	Mon–Fri	Aug 14–18	Students' orientation
	Mon	Aug 21	First day of classes
	Fri	Aug 25	Last day to add/drop courses
	Fri	Sept 1	Last day to apply for course withdrawal/ leave of absence without penalty
	Mon–Wed	Aug 14–Sep 6	Supervisors' selection process
	Fri	Nov 17	Publish the spring 2024 class schedule
	Mon–Fri	Nov 20–24	Early registration for spring 2024 semester
	Tue	Dec 5	Last day of classes
	Wed–Fri	Dec 6–8	Final exams preparation period
	Sun–Thu	Dec 10–14	Final exams period
	Fri	Dec 15	360 meeting – all faculty
	Tues	Dec 19	Faculty to submit grades
	Mon	Dec 25	Grades announcement
	Thu	Dec 28	Students' deadline to submit grade appeals

	Day	Date	Event
Winter break	Fri–Fri	Dec 15, 2023– Jan 5, 2024	Winter break for students
	Wed–Tue	Dec 20, 2023– Jan 2, 2024	Winter break for faculty

The official holidays observed by the University during the fall 2023 semester:

Occasion	Date	Holiday duration
Prophet Mohammed Birthday	Sep 26 or Sep 27, 2023	One day
Commemoration Day	Dec 1, 2023	One day
UAE National Day	Dec 2, 3, 2023	Two days

Spring semester (2024)	Day	Date	Event
	Mon	Jan 8	First day of classes
	Fri	Jan 12	Last day to add/drop courses
	Mon–Tue	Jan 15–Apr 30	Fall 2022 cohort – M.Sc. students/ application for Ph.D. articulation
	Fri	Jan 26	Last day to apply for course withdrawal/ leave of absence without penalty
	Mon	Mar 25	Fall 2022 cohort – M.Sc. students' final deadline for thesis submission

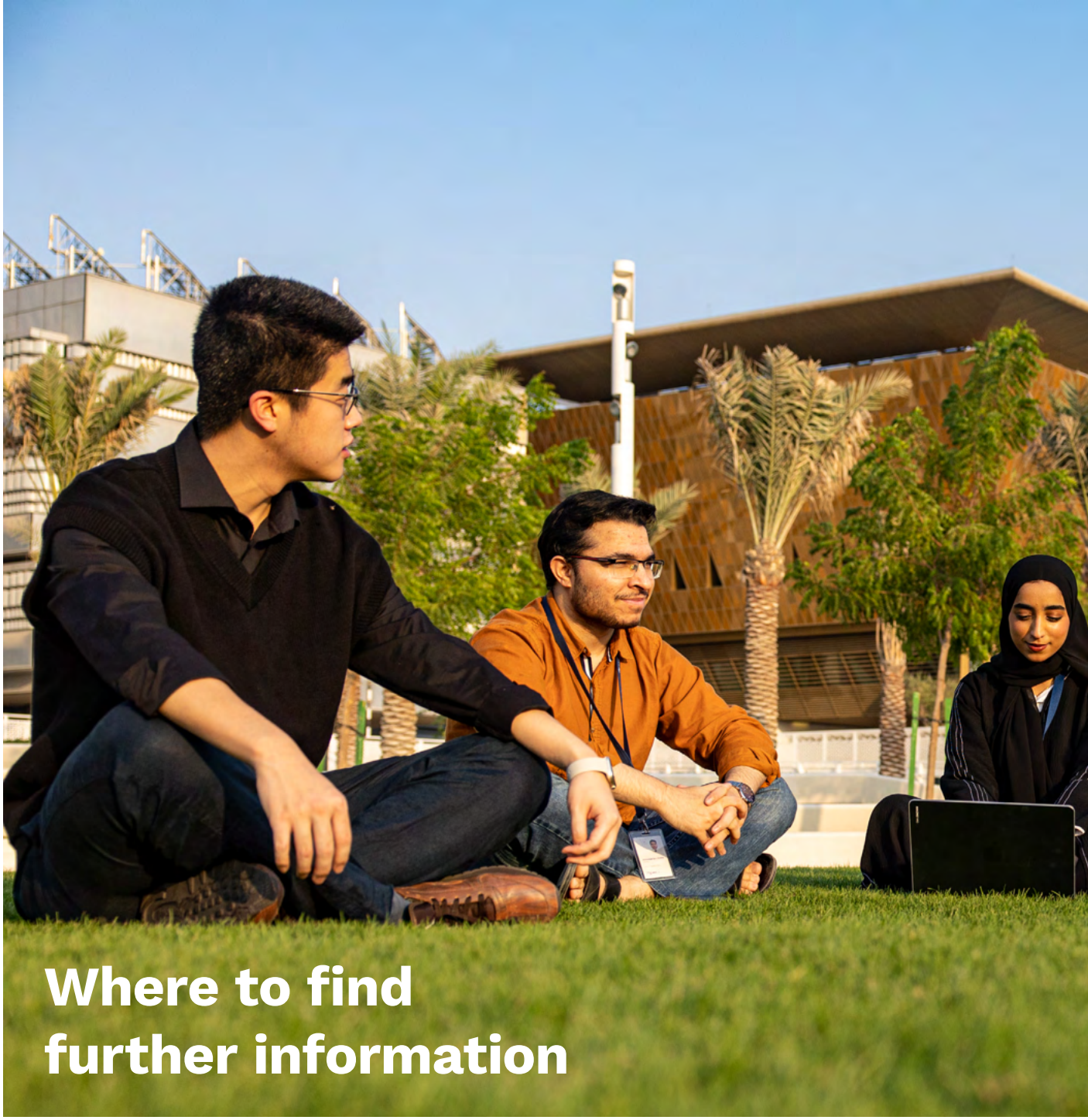
Spring break	Day	Date	Event
	Mon–Fri	Mar 25–29	Spring break for students/faculty

Spring semester continues (2024)	Day	Date	Event
	Thu	Apr 4	Fall 2022 cohort – M.Sc. students' final deadline for thesis defense
	Fri	Apr 12	Publish the fall 2024 class schedule
	Mon	Apr 15	Fall 2022 cohort – Ph.D. students' deadline to sit for the candidacy (oral) exam
	Mon–Fri	Apr 15–19	Early registration for fall 2024 semester
	Wed	May 1	Last day of classes
	Thu–Mon	May 2–6	Final exams preparation period
	Tue–Mon	May 7-13	Final exams period
	Tue	May 14	360 meeting – all faculty
	Thu	May 16	Faculty to submit grades
	Thu	May 23	Grades announcement
	Wed	May 29	Students' deadline to submit grade appeals
	Mon	May 27	Qualifying exam for Ph.D. students – first attempt
	Mon	Jun 10	Qualifying exam for Ph.D. students – second attempt
	Thu	Jun 13	Official Commencement ceremony

Summer break	Day	Date	Event
	Wed	May 15	Start of summer break for students
	Mon	May 20	Start of summer break for faculty

The official holidays observed by the University during the spring 2024 semester:

Occasion	Date	Holiday duration
Eid Al Fitr Holiday	April 10–12	Three days



Where to find further information

For other further inquiries, please find below the list of contacts:

Office of the President	president@mbzuai.ac.ae
Provost Office	provostoffice@mbzuai.ac.ae
Admission	admission@mbzuai.ac.ae
Registrar	registrar@mbzuai.ac.ae
Career and internship	careerservices@mbzuai.ac.ae
Campus Life	campus.life@mbzuai.ac.ae

IT Helpdesk	helpdesk@mbzuai.ac.ae
Research	research@mbzuai.ac.ae
Facilities management	facilities@mbzuai.ac.ae
Finance	finance@mbzuai.ac.ae
Human resources	hr@mbzuai.ac.ae
Security	security@mbzuai.ac.ae

THE UNIVERSITY MOTTO

POWER from **KNOWLEDGE** to **SERVE**

The university

The Mohamed bin Zayed University of Artificial Intelligence (MBZUAI) is established in the Emirate of Abu Dhabi, with a clear mission to drive AI knowledge creation and development, foster economic and social growth, and position the UAE as a hub for the international AI community.

The university, in addition to its academic offerings, will have a direct and indirect impact on AI advancement in the UAE in multiple ways including, but are not limited to:

- Attracting international talents (students and faculty staff) and ensuring the transition to enter the UAE market
- Creating an active AI community and collaborating in AI research and publications
- Hosting conferences that attract AI experts to the UAE and the region
- Supporting technology and AI related startups in the UAE
- Supporting governments and businesses by providing AI consulting services and AI solutions/ applications
- Conducting training and workshops in various AI fields for government entities and businesses.

MBZUAI currently offers

Ph.D. and M.Sc. programs in five AI specializations including machine learning (ML), computer vision (CV), natural language processing (NLP), robotics (ROB) and computer science (CS).

Institutional history

MBZUAI was established as an independent local entity in Abu Dhabi and shall be affiliated to the Executive Council. The university has a Board of Trustees comprising seven members including the chairman of the board.

Vision

Drive excellence in knowledge creation, transfer and use of AI to foster economic growth and position Abu Dhabi as a hub for the international AI community.

Mission

Establish and continually evolve interdisciplinary, collaborative research and development capability in the field of AI, while educating students to be innovators and leaders with the breadth and depth to grow technology and enterprise in the UAE and globally.

Strategic objectives

As a unique institution, purpose built to lead the world in AI research, MBZUAI seeks to be a paradise for transformative research; a cradle for the best minds in computer science; and a hub for startups and high-tech innovation.

Its strategic objectives are:

- Attract the best talent focused on AI
- Develop, train, and retain talent for the UAE economy
- Lead Abu Dhabi's efforts to build and sustain an AI- based knowledge economy
- Develop real business applications in collaboration with industry and the public sector to enhance innovation, productivity, and growth
- Be the birthplace for high-tech innovation and AI startups in the UAE and the MENA region.

Licensing and accreditation

The MBZUAI is located in Abu Dhabi, and is officially licensed from March 10, 2020 by the Ministry of Education of the United Arab Emirates (UAE) to award degrees/qualifications in higher education.

MBZUAI leadership

His Highness Sheikh Mohamed bin Zayed Al Nahyan
President of the UAE

Among his many interests, His Highness Sheikh Mohamed bin Zayed Al Nahyan is known for his unwavering commitment to enhance educational standards in the Emirate of Abu Dhabi and raise them to be on par with the best international standards. The university is named in his honor

Board of Trustees

The Board of Trustees (BoT) comprises of several members, including a chairman of the board. The BoT candidates were identified based on their knowledge and expertise in academia and AI applications across various industries. The BoT has been formed through a resolution issued by the chairman of the Executive Council. The board shall exercise all the powers needed to conduct the work of the university, supervise the management of its affairs, and achieve its objectives. The BoT meets quarterly.

His Excellency Dr. Sultan Ahmed Al Jaber

Minister of Industry and Advanced Technology and member of the Federal Cabinet
Chairman of the MBZUAI Board of Trustees

Professor Sir Michael Brady

Emeritus Professor of Oncological Imaging in the Department of Oncology of the University of Oxford

Professor Anil K. Jain

Distinguished Professor in the Department of Computer Science and Engineering at Michigan State University

Dr. Kai-Fu Lee

Chairman and CEO of Sinovation Ventures and President of Sinovation Venture's Artificial Intelligence Institute

Professor Daniela Rus

Professor of Electrical Engineering and Computer Science and Director of the Computer Science and Artificial Intelligence Laboratory (CSAIL) at Massachusetts Institute of Technology

Peng Xiao

CEO of Abu Dhabi-based Group42 Ltd

His Excellency Mansour Ibrahim Al Mansoori

Member of Abu Dhabi Executive Council and the Chairman of the Department of Health in Abu Dhabi

University leadership

Professor Eric Xing

President and University Professor

Timothy Baldwin

Acting Provost, Associate Provost for Academic Affairs, Department Chair of Natural Language Processing, and Professor of Natural Language Processing

Sultan Al Hajji

Vice President of Public Affairs and Alumni Relations

Ian Mathews

Vice President of Corporate Services

Lily Burns

Associate Provost for Administrative Affairs

Richard Morton

General Counsel

Hong (Dekyi) Liang

Chief of Staff

Available services for students on campus

From the time students are admitted into MBZUAI until graduation, access shall be provided to a range of support services, facilities, and programs at the campus. Students have access to a range of other services, such as: advising, IT support, health services and insurance, prayer rooms, dining facilities and student lounges.

Premises, resources and physical setting

MBZUAI is based in Masdar City, one of the world's most sustainable urban communities, a low-carbon development made up of a rapidly growing clean-tech cluster, business free zone and residential neighborhood with restaurants, shops and public green spaces, surrounded by a student-friendly environment with all the needed amenities. The campus spaces are designed to be fully supportive of an optimal educational experience and compliant with local authorities' regulations as well as international educational standards.

Recreational facilities

MBZUAI is equipped with a sports facility, a sizeable male and female gym, and a swimming pool.

MBZUAI apartments

The residences at MBZUAI 1A is split into four blocks, comprising three floors of apartments, while 1B contains additional housing blocks of four floors each. The blocks are divided into male and females. Each male and female apartment has a bedroom, kitchen, toilet and shower, living/dining, and study area. Some of the apartments comprise more than one bedroom. All apartments have private balconies.

Common system in 1A building apartments:

- A master switch is provided in each room at the entrance to activate all MEP systems (lighting, AC and water).
- The lights work with motion sensors as per occupancy (the timing of this is adjustable). They can also be controlled by switches, which are available inside the room.
- AC units are installed on the ceiling – thermostats are not available to control the temperature inside the rooms as per building design. The AC unit's temperature can be controlled from the building management system (BMS) based on request.
- Centralized fresh air is available and is fed to each room and the corridors.
- Hot and cold water is available all the time; the washbasin taps work with sensors.
- Each room is equipped with an electric hot plate, fridge, microwave, and furniture.
- All the room entrance doors are secured with a centralized access control system (access cards will be provided accordingly).

- Window blind curtains are available and can be operated manually.
- A common laundry room is available in each residential building.
- Centralized garbage chutes are available in each floor with designated bins (general waste, plastic, organic, and aluminum cans).

Common system in 1B building apartments:

- A master switch is provided in each room in 1B building apartments – the user must insert the card in the master switch to activate all MEP systems (lighting, AC and water).
- The lights work with motion sensors as per occupancy (the timing of this is adjustable). They can also be controlled by switches, which are available inside the room.
- AC units are installed on the ceiling, and the temperature can be controlled by thermostats, which are available in each room.
- Centralized fresh air is available and is fed to each room and the corridors.
- Hot and cold water is available all the time; the washbasin taps work with sensors.
- Each room is equipped with two types of hot plate – an electric hot plate and induction hot plate (only induction pans will work on the induction hot plate) – a fridge, microwave, and furniture.
- All the room entrance doors are secured with a centralized access control system (access cards will be provided accordingly).
- Window blind curtains are available, and can be operated manually.
- A common laundry room is available in each residential building.
- Centralized garbage chutes are available in each floor with designated bins (general waste, plastic, organic, and aluminum cans).

Catering arrangements

All apartments are equipped with an electric cooker, fridge, and microwave, but no oven. Cookware, crockery, and cutlery are not provided. Apartments in 1B blocks have shared freezers on each floor.

1A blocks have small freezers in their refrigerators. There is also a canteen on site where breakfast, lunch, and dinner can be purchased. Additionally, a number of retail outlets including restaurants and cafés are located on campus.

Bedrooms are equipped with a bed, built-in wardrobe, and bedside cabinet. Bedding is not provided. Bathroom facilities consist of a shower, toilet, and sink. Towels are not provided. Dining table and chairs, study desk and chair and soft furnishings are provided.

Laundry

There is a laundry located within each of the blocks. There are also a number of common lounges and external balcony areas within each of the blocks. Students are responsible for providing their own laundry detergent. The use of washing/drying machines is free of charge in all facilities.

Majlis/common areas

Common areas are provided on the podium level of the campus. Male and female majlis areas are located in 1A and 1B. Common space can be found in 1B and in the Learning Center and restaurants, cafés, and the canteen.

Cleaning

The common areas are cleaned frequently. It is the resident's responsibility to clean their own apartment. The Campus Life & Facilities team will carry out random checks of the student dorm to ensure cleanliness.

Prayer rooms

There are both male and female prayer rooms located within the campus. In 1B building, there are two prayer rooms for males and females. The male prayer room is located in the Hydro residential building and the female prayer room is located in the Tidal residential building.

In 1A building, there are also male and female prayer rooms. The male prayer room is located in the Knowledge Center building and the female prayer room is located in Biomass residential building.

Parking

At the Masdar City campus, parking is permitted at the North Car Park. Parking spaces are available for faculty, staff, and students and cannot be reserved.

Transportation

Bus services, routes and fared taxis

All taxi services in UAE use meters around the city so you will not need to negotiate fares. Drivers in Abu Dhabi speak English and there is a central national transport phone number that can be used to locate the nearest available taxi: 600 535353.

Banking facilities

First Abu Dhabi Bank
Tel: 02 681 1511
www.bankfab.com

Abu Dhabi Commercial Bank
Tel: 02 672 0000
www.adcb.com

Abu Dhabi Islamic Bank
Tel: 02 610 0600
www.adib.ae

Citibank
Tel: 02 674 2484
www.citibank.com/uae

HSBC
Tel: 600 55 4722
www.hsbc.ae

Most banks have several branches in each city. Contact the bank or visit their website for details of the most convenient branch for you.

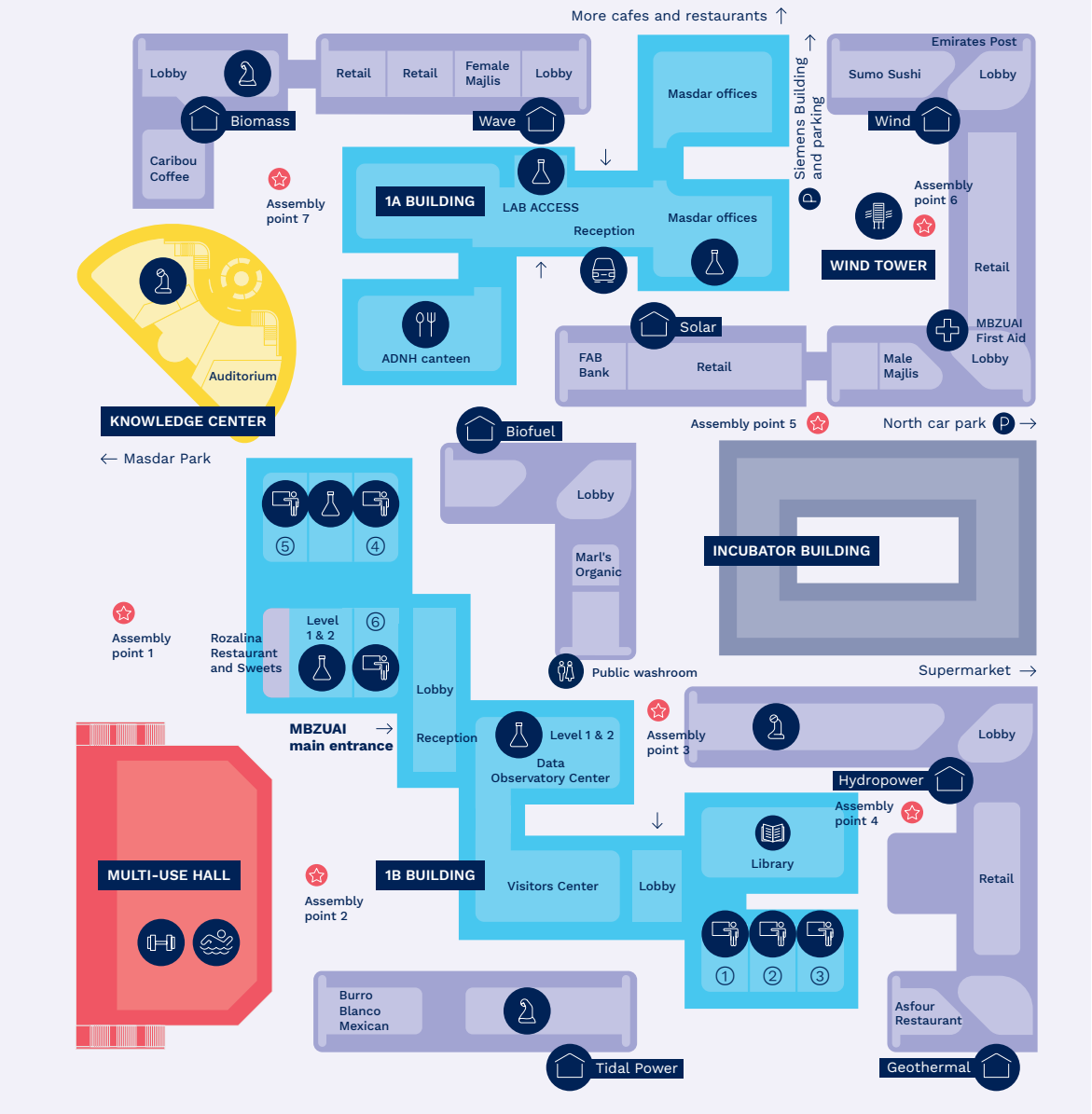
Masdar Park

Masdar Park is a 2,500 square meter green space adjacent to campus, open daily from 9 a.m. to 10 p.m. The park features a children's playground, a music wall and art installations themed on sustainability. Visitors can charge their phones and digital devices using the park's solar-powered benches and interact with The Tree of Light made from recycled building materials. The Tree of Light changes color when touched. For more information, visit https://masdar.ae/en/masdar-city/the-city/recreation.

Travel and tourism

The Abu Dhabi Department of Culture and Tourism and Visit Abu Dhabi provide information regarding travel and tourism:

http://visitabudhabi.ae/en/default.aspx https://www.abudhabi.ae/portal/public/en/homepage



- MBZUAI campus facilities
- Knowledge Center
- Recreation
- Residential and retail
- Classrooms
- Laboratory
- Library
- PRT station
- Swimming pool
- Canteen
- Wind tower
- Student residences
- Male prayer room
- Female prayer room
- Medical Center
- Gym (male and female)
- Public washroom
- Car park
- Assembly point

mbzuai.ac.ae

Health, wellness and safety

Health and safety

The MBZUAI is committed to providing a safe and healthy environment for our students, staff and visitors. However, students are expected to take responsibility for their own actions and not put themselves or others at risk.

Any occupational health and safety issues identified will be taken seriously and addressed promptly. If a student identifies any health and safety risks or has any health and safety concerns, they must contact Campus Life promptly to report any injuries or incidents that occur. Smoking is not allowed on the MBZUAI campus.

Security

MBZUAI is accessible only to authorized individuals. All MBZUAI premises have security gates with security personnel stationed at each entrance.

These security officers will only allow those who are properly authorized to enter the campus.

Fire drills

In case of fire, each academic department has procedures to follow. Students should learn where emergency exits, fire alarms and fire extinguishers are located. In the event of a fire drill or emergency, students must follow the directions of their professor or security personnel.

Medical emergencies

If a student is seriously ill, he/she should contact either the Control Room 24/7 on 02 811 3100 or Main reception 24/7 on 02 811 3369.

Health services

On-campus assistance is available in the form of first aid kits placed around the campus for minor injuries. Students may use their health insurance cards provided by MBZUAI to visit a hospital or medical center for more serious injuries.

- MBZUAI will provide each student with health insurance during their academic journey.
- The health card can be used for medical services in emergency cases and for basic routine treatment. A policy list will be provided stating the coverages included and allocated limits.
- In the event of a serious injury, call an ambulance by dialing 999. For minor injuries or medical complaints, a medical clinic is available on campus which is located in the Solar building podium and is available 24/7. The clinic is fully equipped and ready to accommodate all first aid needs.

Student IT services at MBZUAI

About IT Department

The Information Technology department is responsible for the planning, delivery, and support of the University's main computing facilities. This includes the University's network systems, email and calendaring, management services, research IT and student computing facilities. The IT department also provides support for teaching and learning in several classrooms.

Staff and students are provided with full IT support via the IT department's Helpdesk, which can be contacted via telephone, email or walk-in during normal business hours.

Service	Hours	Contact details
Telephone support	**Mon–Thurs, 8:00 am–5:00 pm** **Fridays: 7:30 am–12:00pm**	02-8113000 (external). Extension 3000
Email support	**Mon–Thurs, 8:00 am–5:00 pm** **Fridays: 7:30 am–12:00pm**	helpdesk@mbzuai.ac.ae
Walk-in support	**Mon–Thurs, 8:00 am–5:00 pm** **Fridays: 7:30 am–12:00pm**	Level 1, Building 1B

Internet access and student email

MBZUAI students can connect their laptop, mobile phone, or tablet to the MBZUAI wireless network to get fast secure internet access. Students in residences can also connect to wireless networks. Connections from outside campus are secured using a virtual private network (VPN).

In the first instance, Campus Life staff will help set up the required username and password. It is the student's responsibility to keep their password secure and not misuse it. If a student forgets their password, they should contact the IT Helpdesk. Before a student is given a password to access the internet and their email account, he/she shall be required to sign the MBZUAI Acceptable Use Policy. Student email is considered an official form of communication between MBZUAI and the students. Users of the internet are governed by the MBZUAI Acceptable Use Policy.

MBZUAI website and portal and e-Services

The MBZUAI website contains a wealth of useful information, including news channels, links to the available library resources, research activities, the academic calendar and more. Students can find the MBZUAI Catalogue on the website. It contains detailed information about programs, MBZUAI's policies, procedures, and requirements.

The MBZUAI website has a link to the restricted access MBZUAI portal. Students can access their email through the portal and will be offered a full e-Services Portfolio. Students gain access to the portal with their username and password. This can be done using a computer on the campus, at home or anywhere with an internet connection.

In addition to the services mentioned above the following is a list of other systems and services that will be of interest.

- Student Information System (SIS)
- Class schedule
- Program curriculum
- Student careers and alumni services
- Student Handbook
- Housing manual
- Microsoft Office 365 (email, MS Teams, Word, Excel, PowerPoint, and OneDrive)
- Printing services
- Learning management system (Moodle)
- MATLAB

Labs and computing

The IT department operates the computer labs located on level 2 of building 1B. The labs are set up for teaching but are available for students when teaching is not taking place. There are 64 machines available in the labs. Adjacent to the labs, there are 40 machines that are available 24/7 for student use on a first come, first served basis. There are also several shared screens, keyboards, and mice available for student use with their own laptops.

Access to high performance computing (HPC) resources

Ph.D. students are granted access to the MBZUAI HPC resources at MBZUAI and must adhere to the fair use policy that is in place. Master's students can apply for access to HPC resources with the express permission of their supervisor. Details can be obtained from the IT Helpdesk.

Student representation

There are two representatives of the Graduate Student Council (GSC) that serve on the IT Committee. The two representatives meet bi-weekly with the Director of IT to discuss student IT needs and issues and can be contacted at gsc@mbzuai.ac.ae. The council also operates a SharePoint site.

Graduate Student Council - Home (sharepoint.com)

IT Helpdesk contact details

There is an IT Helpdesk located on Level 1, Building 1B on campus to help students with general IT queries. The helpdesk provides a walk-in service, a telephone service (extension 3000) and an email service: helpdesk@mbzuai.ac.ae.

The helpdesk operates during university business hours, Monday to Friday.

Admission

Master of Science (M.Sc.) programs

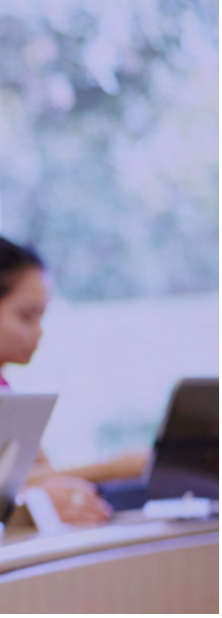
To be considered for admission to a Master of Science program at MBZUAI an applicant must provide evidence of the following:

- A completed bachelor's degree in a STEM field such as Computer Science, Electrical Engineering, Computer Engineering, Mathematics, Physics and other relevant Science and Engineering majors, from an accredited university or college recognized by the UAE Ministry of Education, without the need of prior work experience.

OR

  - Academically Distinguished Student Portfolio
  - Bachelor's degree in a STEM field, plus each applicant must submit evidence including, but are not limited to, the following:
  - Research Capability & Output.
  - Technical Skills.
  - Graduation from a highly ranked university.
  - Other factors.
  - Minimum CGPA 3.0/ 4.0.

- Applicants must provide their complete degree certificates and transcripts (in English) when submitting their application. Senior-level students can apply initially with a copy of their transcript and upon admission must submit official complete degree certificate/transcript. A degree attestation (for degrees from the UAE) or an equivalency certificate (for degrees acquired outside the UAE) should also be furnished within their first semester at the university.
- Knowledge, skills & competencies in some of the following subjects:
  - Programming skills such as Python, C, C++ or MatLab.
  - Math skills such as:
  - Data Structures and Algorithms.
  - Linear Algebra.
  - Probability and Statistics.
  - Calculus
- A minimum undergraduate CGPA of 3.2 (on a 4.0 scale).



- **An English Language Proficiency Certificate which must remain valid during the application process. Minimum requirements are:**
  - TOEFL iBT with a minimum total score of 90, or
  - IELTS Academic with a minimum overall score of 6.5, or
  - EmSAT English with a minimum total score of 1550.
  - TOEFL iBT, IELTS Academic and EmSAT English certificates should be valid during the application process.

  Waiver requests from applicants who undertook all their schooling (K-12) plus a bachelor's degree in English in a reference English speaking country (e.g., UK, USA, Australia, New Zealand) may be processed in accordance with the Admission Procedure.

  Applicants must submit notarized copies of their documents during the application stage and attested documents upon admission. Waiver decisions will be given within seven days after receiving all requirements.
- A minimum of two letters of recommendations from mentors and supervisors or others with good knowledge of the applicant's qualification are mandatory, at least one should be from a previous course instructor or faculty/research advisor and the other one from a current or previous work supervisor.
- Selected applicants will be invited to participate in an entry exam to assess their knowledge and skills:
  - Math and programming for CV, ML and NLP
  - Math, programming and machine learning for CS & Robotics
- A Graduate Record Examination (GRE) General Score may be optionally submitted.
- Statement of Purpose: In a 500-to-1,000-word essay, the applicant should present his/her motivation for applying to the university. It may include information regarding the applicant's personal and academic background as well as his/her chosen career path; goals as a prospective student; graduation plans; and other details that will support the application.

All applications for admission to Master of Science programs must be submitted online providing all required documentation.

Admission Doctor of Philosophy (Ph.D.) programs

In order to be considered for admission to a PhD program at MBZUAI an applicant must provide evidence of the following:

Degree Requirements for Computer Vision, Machine Learning, Natural Language Processing and Robotics

- **Completed Degree**

EITHER

Bachelor's degree in a STEM field such as Computer Science, Electrical Engineering, Computer Engineering, Mathematics, Physics and other relevant Science and Engineering majors, from a university accredited or recognized by the UAE Ministry of Education (MoE) which demonstrates academic distinction in a discipline appropriate for the doctoral degree. Students should have a CGPA of at least 3.5 (on a 4.0 scale) or equivalent and valid Graduate Record Examination (GRE) scores of at least 150 (Verbal Reasoning), 150 (Quantitative Reasoning) and 3 (Analytical Writing) is mandatory. However, the GRE can be waived if the applicant is an academically distinguished student as specified below.

OR

- Bachelor's and master's degrees in STEM fields such as Computer Science, Electrical Engineering, Computer Engineering, Mathematics, Physics and other relevant Science and Engineering majors, from a university accredited or recognized by the UAE Ministry of Education (MoE). Students should have a minimum CGPA of 3.2 (on a 4.0 scale). The GRE submission is optional for applicants with both bachelor's and master's degrees although submitting a GRE will be considered a plus during the evaluation.

OR

- Academically Distinguished Student Portfolio

  Bachelor's degree in a STEM field, plus each applicant must submit evidence including, but are not limited to, the following:

  - Research Capability & Output.
  - Technical Skills.
  - Graduation from a highly ranked university.
  - Other factors.
  - Minimum CGPA 3.0/ 4.0.

- The GRE submission is optional for applications via the Academically Distinguished Student Portfolio pathway, although submitting a GRE will be considered a plus during the evaluation.

Degree Requirements for Computer Science

- **Completed Degree**

EITHER

Bachelor's degree in computer science with a minimum of 50% Computer Science content, from a university accredited or recognized by the UAE Ministry of Education (MoE) which demonstrates academic distinction. Students should have a strong background in both applied and theoretical aspects of computer science with a CGPA of at least 3.5 (on a 4.0 scale) or equivalent and valid Graduate Record Examination (GRE) scores of at least 150 (Verbal Reasoning), 150 (Quantitative Reasoning) and 3 (Analytical Writing) is mandatory. However, the GRE can be waived if the applicant is an academically distinguished student as specified below.

OR

- Bachelor's and master's degrees in Computer Science from a university accredited or recognized by the UAE Ministry of Education (MoE) which demonstrate academic distinction. Students should have a strong background in both applied and theoretical aspects of computer science with a minimum CGPA of 3.2 (on a 4.0 scale). The GRE submission is optional for applicants with both bachelor's and master's degrees although submitting a GRE will be considered a plus during the evaluation.

OR

- Academically Distinguished Student Portfolio

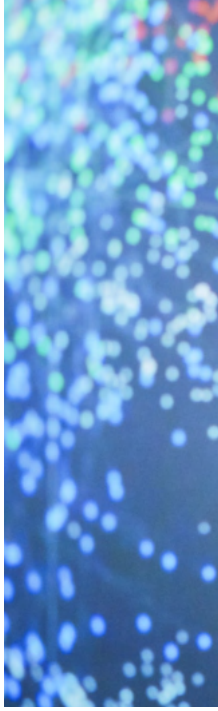
  Bachelor's degree in Computer science with a minimum of 50% Computer Science content, or bachelor's and master's degree in computer science fields, plus each applicant must submit evidence including, but are not limited to, the following:

  - Research Capability & Output.
  - Technical Skills.
  - Graduation from a highly ranked university.
  - Other factors.
  - Minimum CGPA 3.0/ 4.0.

Following requirments apply for admission to all MBZUAI Ph.D. programs.

- The GRE submission is optional for applications via the Academically Distinguished Student Portfolio pathway, although submitting a GRE will be considered a plus during the evaluation.

- Applicants must provide their complete degree certificates and transcripts (in English) when submitting their application. Senior students can apply initially with a copy of their transcript and upon admission must submit an official complete degree certificate/transcript. A degree attestation (for degrees from the UAE) or an equivalency certificate (for degrees acquired outside the UAE) should also be furnished within their first semester at the university.



- **Knowledge & Competencies: Demonstrate evidence of skills acquired in some of the following subjects:**
  - Programming skills such as Python or C or C++ or MatLab.
  - Math skills such as:
    - Data Structures and Algorithms.
    - Linear Algebra.
    - Probability and Statistics.
    - Calculus.
  - Knowledge of basic machine learning algorithms such as linear regression, decision trees, Support Vector Machines, etc.
- **English Language Proficiency Certificate (for applications submitted from Fall 2021 intake onwards). Minimum requirements are:**
  - TOEFL iBT with a minimum total score of 90; or
  - IELTS Academic with a minimum overall score of 6.5 or
  - EmSAT English with a minimum total score of 1550.
  - TOEFL iBT, IELTS Academic and EmSAT certificates should be valid during the application process.

  Waiver requests from applicants who undertook all their schooling (K-12) plus a bachelor's degree and/or a Master's degree, as applicable, in English in a reference English speaking country (e.g., UK, USA, Australia, New Zealand) may be processed in accordance with the Admission Procedure.

  Applicants must submit notarized copies of their documents during the application stage and attested documents upon admission. Waiver decisions will be given within seven days after receiving all requirements.

- Three (3) letters of recommendation from mentors and supervisors or others with good knowledge of the applicant's qualifications are mandatory. At least one letter should be from a previous course instructor or faculty/ research advisor and the others from a current or previous work supervisor
- Selected applicants will be invited to participate in an entry exam to assess their knowledge and skills in Math, programming and Machine learning.
- **Statement of Purpose:** In a 500 to 1,000-word essay, the applicant should present his/her motivation for applying to the university. It may include information regarding the applicant's personal and academic background as well as his/her chosen career path; goals as a prospective student; graduation plans; and other details that will support the application.
- **Research Statement:** a 1–3-page document which provides a high-level overview of the applicant's past research experience and the research he/ she is interested in working on, including his/her motivation for wanting to investigate this area. Note that applicants are expected to write a research statement completely independently. The admission committee will review an applicant's research statement and use it as one of the measures to determine if an applicant's interests and experience make them a good fit for MBZUAI's research programs. MBZUAI faculty will NOT help applicants write a research statement for the purpose of the application. It is recommended that the statement contains few sections including introduction, literature review, problem definition, methods (optional), timeline, and a list of references.

All applications for admission to PhD programs must be submitted online providing all required documentation.

Credit transfer

Students applying for admission who wish to transfer credit from a federal or licensed institution in the UAE, or a foreign institution of higher learning based outside the UAE and accredited in their home country must provide evidence, as outlined in the admission procedure, which will allow the MBZUAI Academic Department to make a determination regarding the transfer.

- The limit for the number of transfer credits that may be accepted for a specific degree program is 25% of total credit hours for M.Sc. and Ph.D. programs.
- Transfers will only be permitted for students who are in good academic standing and who are eligible to return to their current or former institution.
- MBZUAI will accept the transfer of credits only for courses relevant to the degree that provide equivalent learning outcomes and in which the student earned a grade of B (3.0 on a 4.0 scale) or better.
- The grade of the transfer credit course will be recorded as a "TC" on the transcript record. The approved transfer credits will be calculated towards the credit hours but not included in GPA calculation.
- The course transfer credits may not have been used previously in any graduate program to fulfil the requirement of any other graduate degree.
- The course credits must have been completed no more than a maximum of two (2) years prior to the student's acceptance into the program of MBZUAI.

The MBZUAI academic department will have the ultimate right to accept or reject the transfer requests for any student.

All applications for transfer credit to M.Sc. or Ph.D. programs must be submitted online providing all required documentation.

Recognition of prior learning

MBZUAI does not recognize prior learning and does not award credit for informal and non-formal learning that has taken place prior to admission into its academic programs, other than the credit specified in the admission policy and associated procedures.

Prior learning in the form of professional certification, training programs, credit bearing courses of non-accredited degrees, and other similar programs will not receive any credit towards academic degree programs.

Course exemptions

A student may be granted a course exemption, rather than credit, if they can provide evidence that a course previously studied at a federal or licensed institution in the UAE, or a foreign institution of higher learning based outside the UAE and accredited in its home country, is equivalent to a course that forms part of the program for which the student is applying. Course exemptions are usually only granted for mandatory courses or those that form a prerequisite for other courses.

The student must provide evidence, as outlined in the admission procedure, which will allow the

MBZUAI academic department to decide regarding the course exemption.

MBZUAI will consider applications for course exemption only for courses relevant to the degree that provide equivalent learning outcomes and in which the student earned a grade of B (3.3/4) or better.

The grade of the exempted course will be recorded as a "EX" on the transcript record. The exempted course will have no credit assigned and will not be used in the calculation of the CGPA.

The exempted course will not count towards the course requirements for a program.

The previous study being used as evidence for the course exemption must have been completed no more than a maximum of two (2) years prior to the student's acceptance into the MBZUAI program.

The MBZUAI Academic Department will have the ultimate right to accept or reject the application for course exemption for any student.

All applications for transfer credit to M.Sc. or Ph.D. programs must be submitted online providing all required documentation.

Scholarships

All admitted students are granted full scholarship upon acceptance. The scholarship includes 100% tuition fees, accommodation, health insurance and a competitive monthly stipend and annual ticket to the student's home country.

To retain a scholarship, students must meet the following criteria:

- Maintain a CGPA of 3.3 or above.
- Complete their degree requirements within the allowed duration, as set out in the Academic Progress Policy.
- Maintain a clean deed record, and with no evidence of dishonest or unethical behavior.

Tuition fees

Program	Fee per one credit
M.Sc.	AED 5,000
Ph.D.	AED 6,600

Registration

Student ID

Every student at MBZUAI receives an MBZUAI identity card after being admitted and enrolled. The card is valid until the students complete their studies. These cards are issued by the Office of Campus Life. ID cards will be distributed to all students during orientation week.

The student should ensure to carry his/her card at all times around the university and should not allow anyone else to use this card.

Academic advising

MBZUAI will provide the appropriate infrastructure and student advising framework to allow students to complete their education and research in a timely and productive manner.

- Student advising shall be impartial and focus on students' needs rather than those of individual departments or the university.
- During the initial weeks of the first semester of study, faculty will showcase their research by means of presentations.
- During that time, students are given the opportunity to schedule 1:1 meetings with any faculty they want to meet.
- After meeting with the supervisors, each student is asked to submit, via an e-form,their top three choices of faculty (no more than one co-supervisor is permitted during the first year of study, but students still need to provide a ranked list of faculty).
- Wherever possible, the preferences of students who have identified a preferred MBZUAI supervisor prior to their arrival at the University will be honored. Accordingly,they should submit their preference via the e-form, as outlined above, and include a comment noting the rationale for the preferred supervisor.However, the following should be noted and will be applied:

  - There is no guarantee that the preferred supervisor will be assigned.

Academic regulations

Academic calendar

MBZUAI follows an academic year that starts in August through to May, with a two semesters setup per year, of 17 weeks study per semester.

Language of instruction

All courses in MBZUAI programs offered in English only.

Official communication method (email)

MBZUAI has adopted email as the primary means for official communication to its students, faculty, and staff. The university will send all official communication regarding academic and administrative matters, important information, and time-sensitive notices to the email accounts provided by the university. It is the student's responsibility to monitor their university email regularly to ensure that such communication is received. Failure to check email, errors in forwarding email, and returned email due to full mailbox, will not excuse a student from missing announcements or deadlines. Students are expected to use the email account provided by the university to communicate official matters to the university.

Duration of study

Students are required to make steady progress towards meeting degree requirements and must successfully pass all program components (as per their intake year - taught courses, internship and thesis/dissertation) within the normal allowed time to completion.

The normal time to complete for a master's program is two years, and the maximum time to complete is four years, inclusive of any approved leave of absence.

The normal time to complete a Ph.D. program is four years, and the maximum time to complete is six years, inclusive of any approved leave of absence.

Change of program

To change the current program, a student must submit a program change e-form. The form must be approved by the student's supervisor and the department chair of both the student's current program and the student's requested program.

Changes of program are subject to:

- Space being available in the requested program
- The student can change his/her program only once and before the beginning of the second semester
- The student should be in good academic standing at the end of the first semester
- This change should not affect the allotted study duration of the program

Grading system

For Fall 2022 intake onwards, the following grades and guidelines are used at MBZUAI:

Grade letters, points, percentages and descriptors			
Grade	**Grade points**	**Percentage**	**Grade definition**
A+	4	97.0 – 100%	
A	3.7	92.0 – 96.99%	
A-	3.5	87.0 – 91.99%	
B+	3.3	80.0 – 86.99%	
B	3	75.0 – 79.99%	
B-	2.7	71.0 – 74.99%	
C+	2.3	67.0 – 70.99%	
C	2	64.0 – 66.99%	
C-	1.7	60.0 - 63.99%	
F	0	0.0 – 59.99%	Failing grade in coursework
U	0	0	Unsatisfactory in Internship/Thesis (Research)
WF	0	0	Withdrawal after the add/drop week

Prior to 2022 the following grades and guidelines were used at MBZUAI:

Grade letters, points, percentages and descriptors			
Grade	**Grade points**	**Percentage**	**Grade definition**
A	4.0	95-100	Exceptional
A-	3.7	89-94.99	Excellent
B+	3.3	83-88.99	Very Good
B	3.0	77-82.99	Good
B-	2.7	71-76.99	Average
C+	2.3	65-70.99	Below Average
C	2.0	59-64.99	
C-	1.7	50-58.99	
F	Fail	Less than 50	Failing grade in coursework
U	Fail		Unsatisfactory in internship/ thesis/research
WF	Withdrawal after the add/ drop week		

Additional letter grades are used to denote special cases. These letter grades do not have corresponding grade points, and hence are not used in calculating a student's grade point average.

Other letter grades	
Grade	**Description**
I	Incomplete
TC	Transfer
W	Withdrawn
EX	Course exemption
S	Satisfactory in internship/ thesis/research

Term grade point average (TGPA).

The grade point average for a term or semester is calculated by dividing the sum of the quality points earned in that term or semester by the number of credit hours attempted.

Cumulative grade point average (CGPA).

The cumulative grade point average is calculated by dividing the sum of the quality points earned in all terms and semesters by the credit hours attempted in all those terms and semesters. This average is used to assess the student's overall academic standing at the University.

At the end of each semester, student grade point averages are used in determining academic actions (good standing, probation, dismissal, etc.) and scholarship decisions.

Conversely, academic actions and scholarship decisions will be updated if a student's grade point average is altered due to approved faculty grade changes.

How to calculate your GPA

Fall semester

Core courses	Credit hours	Grade	Grade value	Quality points
ML701	4	B	3.0	12.0
AI701	4	A	3.7	14.8
MTH701	4	B+	3.3	13.2
Semester Total	12			40.00
Semester GPA = 40 ÷ 12 = 3.33				

Spring semester

Core courses	Credit hours	Grade	Grade value	Quality points
ML703	4	B+	3.3	13.2
ML702	4	B	3.0	12.0
CV705	4	A+	4.00	16.0
Semester Total	12			41.2
Semester GPA = 41.2 ÷ 12 = 3.43				

Core courses	Credit hours	Grade	Grade value	Quality points
Cumulative GPA	24			80.00
CGPA = 81.2 ÷ 24 = 3.38				

Grade changes

Final course grades are officially reported by the instructor at the end of an academic semester and recorded by the Registrar's Office. Officially recorded grades can only be changed with the approval of the course instructor and department chair. A request to change a grade may be initiated in writing by the student or the course instructor.

A student may appeal an officially recorded grade by submitting a Change Grade Request Form within three working days of when the final grade was posted to the Registrar's Office. Grade appeals will be processed as per the provisions in Registrar's Policy Manual.

Managing courses

Course registration process

- A student must be officially registered in a course to earn academic credit.
- Students must meet with their academic supervisor during the announced registration period to agree on the courses to be registered.
- Students must register during the designated registration period as published in the University calendar each term until the degree has been formally awarded.

Course load

Students admitted to MBZUAI programs are required to maintain a full-time status by registering in a minimum of 12 credit hours per semester during the first year. In exceptional circumstances, a student may be approved to carry a reduced credit load upon the approval of the supervisor, Registrar and the department chair/deputy.

Adding/dropping courses

A student may only change his/her schedule during the add/drop period as designated in the University calendar. If the deadline has passed, a student cannot change their class schedule unless they provide evidence for extenuating circumstances and after the approval of the supervisor, department chair/deputy and the Registrar.

Course withdrawal

A student who encounters unanticipated difficulty in a course may withdraw from a course until the end of the second week from the start of the semester (as per the university calendar) through a "course withdrawal request form" approved by the student's primary supervisor, department chair/deputy, and the Registrar.

Withdrawing from a course after the deadline results in academic/financial penalty and requires the approval of the academic supervisor and the Provost through a “course withdrawal request form”.

In case the course withdrawal will result in the student being underload (less than 12 credits), then Provost approval is required in addition to the above approvals.

Course restrictions and prerequisites

Enrollment in some courses may be restricted. For example, a course may be open to students within a specific program or require that a student has master’s or doctoral level standing. In some cases, registration may not be permitted without the approval of the course instructor. A program of study may also require that courses be taken in a certain order or taken together. A course that is required to be taken before another course is called a “prerequisite”. Students are not permitted to register for a course with a prerequisite unless the prerequisite course has been completed with a passing grade.

Limitation of courses offered

The University reserves the right to cancel any course listed in the catalogue or scheduled to be offered. Notification of a cancelled course will be sent to any affected students at their university email address.

Class cancellations

On rare occasions, it may be necessary to cancel a scheduled class. Under such circumstances, students will be notified in advance.

Course feedback

Students are required to give their feedback on all courses at the end of every semester, which ensures the quality of course delivery. Student feedback is further considered during course review and development.

Attendance, leave of absence, withdrawal and resuming studies

Attendance

Class attendance is not mandatory unless specified as a requirement in the course syllabus. However, all MBZUAI students are strongly encouraged to attend in person as there is a correlation between attendance and academic achievement.

If attendance is a course requirement, the instructor will keep track of attendance in his/her classroom.

Full-time students should be aware that they are not allowed to work more than 20 hours per week to ensure that they are not overloaded by paid work, which will inhibit the time that they can attend their classes or affect their study outcome.

Leave of absence

A student may request a leave of absence for one semester only during the period of study at MBZUAI for extenuating circumstances by submitting the “leave of absence request form”, approved by the academic advisor and the Provost.

If the student requests to extend the leave of absence for another semester, he/she should submit an appeal to the Appeal Committee.

If the student exceeds the approved leave of absence duration without a formal notification, he/she will be considered withdrawn from the university and financial penalties will apply.

Resuming studies

A student who has been on a “leave of absence” status for a semester or more and would like to resume his/

her studies, he/she should submit a “Resume Study Request Form” to the Registrar’s office.

Annual leave

Full-time graduate students holding MBZUAI scholarship may be eligible to take annual leave as per the entitlement stated in the financial obligations policy.

- Students must meet, discuss and obtain the approval of their advisor(s) prior to applying for leave. The advisor is responsible for guiding the student and approving annual leave requests.
- Students must notify the Office of Campus Life after receiving their advisor’s approval.
- Students must apply for annual leave at least two weeks prior to the first day of absence.
- Generally, annual leave can be taken only during the official study breaks published in the university academic calendar.

Withdrawal from the University

A student may voluntarily withdraw from the University after the approval of the Appeal Committee and subject to the terms and conditions of the scholarship contract.

Students should be aware they shall pay to the University all expenses including tuition fees, monthly allowances, medical expenses, and any other expenses incurred by the University during the period of study.

If the student submits legitimate justification for withdrawal to the Appeal Committee, the University may, if it deems necessary, exempt the student from all or some of the obligations stipulated in the financial obligations policy.

The student should complete the clearance process, which can be initiated by submitting the application for “complete withdrawal from University”.

Students assessments and examinations

Assessment and examination

All courses must have an approved course assessment plan. It is the responsibility of the faculty teaching a course to ensure the course assessment plan in the course syllabus is followed and communicated, including deadlines, to students at the beginning of the course.

Faculty members are free to assess students' performance in their classes by using a variety of appropriate assessment methods. Assessment methods include, but are not limited to, written examinations, papers, presentations and projects.

In-class examinations must be proctored by faculty teaching the course or their designees. In all assessments, students must strictly comply with the policies on academic integrity.

All course assessments will be graded as per the grading policy.

Faculty members must keep complete records of student assessments for a minimum period of two (2) years to ensure the accurate calculation of student performance and as a reference in the event of an appeal.

In the event of late submission of coursework, the faculty member shall decide whether to accept the coursework, apply a penalty for late submission or reject it. Faculty should follow the late assessment policy.

Incomplete grades

Students are expected to complete their course(s) in the semester in which they are registered. In exceptional circumstances, a student may be allowed to complete a course in the following semester after securing permission from the course faculty member through an "incomplete grade request form". A grade of "I" (incomplete) will be assigned for the course. Students must complete the course requirements no later than the first week of the following semester. Failure to meet the deadline, will cause the student to receive a grade of "F" for the course.

All final grades must be submitted by faculty members into the Student Information System within the deadlines specified by the Registrar. The chair of each program must approve the submitted grades prior to the announcement of final grades by the Registrar's Office.

A student may appeal a grade issued by MBZUAI. The student's ability to appeal a grade once submitted is strictly controlled in the context of the Student Grievances/financial obligations policy.

Records and transcripts

- The Registrar is responsible for maintaining all students' personal and academic records, ensuring the privacy and confidentiality of these records, and ensuring compliance with the policies and regulations of MBZUAI. Electronic files will be secured with restricted access.
- Students have the right to review their personal information, academic and educational records, and to update or change their personal data and contact details.
- The Registrar's Office is the only unit who has the authority to print official transcripts.
- Disclosure of information on the educational records to anyone within or outside MBZUAI, except as indicated in this policy, requires the student's written consent.
- MBZUAI may have access, without the student's prior consent and without a record being made, to specific student records in which they have a legitimate educational interest. For this purpose, university officials include both academic and administrative personnel. Only those university officials who need to obtain information about the student may have access to that information.
- Educational records may be disclosed, with a student's prior consent, to officials of another educational institution in which the student seeks or intends to enroll, or in which the student is enrolled concurrently. Information may be released to government ministries and agencies for compliance or accreditation purposes.
- Information related to grades, finances and some personal information is private. MBZUAI is responsible for the appropriate protection of private information, and holds the individuals who enter, maintain and review this data accountable in this regard.
- Any document that contains non-public information about students or applicants – especially sensitive items such as admission applications, letters of recommendation, grades, or private addresses – should receive special handling when retention is no longer needed. It should either be shredded or destroyed in some way that maintains its confidentiality.
- MBZUAI will comply with all applicable laws, regulations and standards in the Emirate of Abu Dhabi and the UAE, governing the privacy and integrity of student information.
- The University reserves the right to share student information as required by government entities in the UAE, award sponsor and/or any other entities requesting the information, as per the University's policies and procedures.

Academic standing :

- A student's academic standing at the end of a semester will determine the students' eligibility to continue their progress towards earning their degree at MBZUAI. For spring **2021 & fall 2021** intake: at the end of each semester, the academic standing of the students will be determined according to the following:
- **If the student is registered in coursework:**
  - Cumulative grade point average (CGPA). To remain in good academic standing, a student must maintain a CGPA of 3.0/4.0 or above.
- **If the student is registered in the research thesis:**
  - To progress in the research thesis, students must achieve a minimum evaluation of satisfactory by the supervisor(s) at the end of each semester.
- For **fall 2022** intakes onwards: at the end of each semester, the academic standing of the students will be determined according to the following:
- **If the student is registered in coursework:**
  - Cumulative grade point average (CGPA). To remain in good academic standing, a student must maintain a CGPA of 3.3/4.0 or above.
- **If the student is registered in the research thesis:**
  - To progressing in the research thesis, students must achieve a minimum evaluation of satisfactory by the supervisor(s) at the end of each semester.
- Initial registration in the research thesis:for Ph.D. students is contingent upon:
  - Successful completion of all coursework; and
  - Successfully passing the qualifying exam (QE). Students will have two (2) attempts at passing the qualifying exam. If a student fails both attempts, they will be dismissed from the Ph.D. program.
- Ongoing registration in the research thesis for Ph.D. students is contingent upon:
  - Successfully passing the candidacy exam (CE) at the end of the second thesis semester; and
  - Achieving a minimum evaluation of satisfactory by the student's supervisor(s) at the end of each semester.

Academic standing

Good standing: students shall be considered in good academic standing if they maintain the required minimum cumulative grade point average (CGPA) as per their intake year.

Academic probation

A student will be placed on academic probation for a semester if:

- The CGPA is lower than the required CGPA as per the intake year.
- The student receives a third (C) grade during his/her study tenure.
- The student receives an "F" in any course in any semester.
- The student receives a grade of unsatisfactory (U) for thesis/dissertation credits.

If the student is placed on academic probation, then:

a. The student should retake the course/s that led to the drop of the CGPA.

b. The student should pay the tuition fees of the repeated course/s only.

c. The student should report on a bi-weekly basis to the supervisor and must not achieve less than the required CGPA according to their intake year by the end of the semester.

Academic dismissal

A student will be given academic dismissal from MBZUAI if his/her CGPA remains lower than the required CGPA as per the intake year for two consecutive semesters. A student who has been given an academic dismissal from MBZUAI may submit an Academic Appeal Request.

Special probation

A student who has been granted an academic appeal against dismissal will be placed on special probation for one semester. The student should achieve the required minimum CGPA as per their intake year for that semester to be placed in good standing and continue his/her studies at MBZUAI.

If the student could not achieve the required CGPA, then he/she will be academically dismissed, and he/she will not be entitled to any further appeals.

Graduation and commencement

A student must successfully pass all program components (taught courses and thesis) within the allowed time and maintain the required CGPA or better-as per the student's catalogue year to qualify for graduation.

For fall 2022 intake onwards:

- Internship will be considered as a graduation requirement in addition to all program components (courses and thesis).
- A student must successfully pass all program components (taught courses, internship, and thesis) within the allowed time and maintain an overall CGPA of 3.3/4.0 or better in order to qualify for graduation.

Master's degree

- A master's degree consists of 36 credit hours.
- The normal time to complete for a master's program is two years, and the maximum time to complete is four years, inclusive of any approved leave of absence.

Doctoral degree

- A Ph.D. degree consists of 60 credit hours.
- The normal time to complete for a Ph.D. program is four years, and the maximum time to complete is six years, inclusive of any approved leave of absence.

Students rights and responsibilities

MBZUAI seeks to create an environment that promotes academic achievement and integrity, that is protective of free inquiry, and that serves its educational mission. MBZUAI assumes that all students come to the University for a serious purpose and expects them to be responsible individuals who demonstrate the highest standards of ethical behavior, honesty and academic integrity in their pursuit of knowledge.

Unethical behavior is not worthy of members of the university community and will be dealt with severely. Academic dishonesty in any form undermines the very foundations of higher education and will not be tolerated.

Academic dishonesty includes, but is not limited to, cheating, fabrication and falsification, misconduct in research, plagiarism, and recycling or multiple submissions.

The **Academic Integrity Policy** explains in greater detail the behaviors that are considered academic misconduct. The **Academic Integrity Procedure** sets out the steps and processes associated with the policy and clarifies the roles and responsibilities of the Academic Integrity Committee, faculty and students in the academic integrity processes.

Use of graduate assistant

Graduate assistant selection and engagement

- Students may be selected as graduate assistants to assist faculty members in their course delivery tasks. Selection will be based on a student's academic results during their studies and their soft skills and proficiency. Thus, to be eligible for the Graduate Assistantship program, students must fulfill the following criteria:
  - Attain at least B+ in the course that the assistant will contribute to.
  - Demonstrate proficiency in terms of soft skills (e.g., communication and social skills, character or personality traits). Students may be evaluated through an interview conducted by the concerned faculty member or through informal observation.
  - Additional criteria set by the Provost and approved by the President such as previous experience in similar projects or courses, experience in carrying out literature searches, etc.
- Selected students will receive a financial compensation on an hourly basis, decided by the Provost.
- The use of graduate assistants should not exceed six hours per week.
- The supervisor faculty member may assign different tasks to the graduate assistant that include, but not be limited to:
  - Preparation of laboratory material.
  - Marking of student assignments.
  - Assistance with exam organization.
  - Marking of exams.

Please refer to the "use of graduate assistants" section of the Academic Programs Policy and associated procedure.

Student grievances/ financial obligations

Grievances against grading or evaluation of academic work

Stage one

If a student suspects that an error has been made in recording a final grade, the initial recourse for the student should be to contact the faculty formally (via email). A student must be able to provide copies of graded assignments along with any other relevant documents to support the appeal. If an error is detected, faculty members should submit a "Change Grade Request Form" to the Registrar with justification copying the department chair within three working days from the date of posting the grade.

Stage two

If a meeting and thorough discussions with the faculty member alone does not resolve the student's concern, the student should formally (via email) contact the department chair. The department chair will meet with the student and the faculty member, providing an independent review. If an error is detected, faculty members should submit a "change grade request form" to the Registrar with justification copying the department chair within five working days from the date of posting the grade.

Stage three

If after having completed both levels of communication, the dispute persists, a student wishing to challenge a final grade formally, must submit an Appeal Statement Form to the Appeal Committee, chaired by the Provost, within seven working days of when the final grade was posted.

The following should be completed by the student:

The student's submission must do the following:

- Demonstrate having followed the above required channels of communication with both the faculty member and department chair.
- Demonstrate that communication with the faculty member regarding the grade was initiated within five working days of when the final grade was posted.
- Provide copies of graded assignments along with any other relevant documents to support the appeal.
- Describe in detail the conditions and factors that led to the perceived grievance and the actions taken during the resolution process.

Actions by the Appeal Committee

- If a member of the Appeal Committee was in any way involved in a student grievance, they shall recuse themselves and a replacement will be randomly selected from MBZUAI faculty or staff.
- The committee investigates and consults with all the parties involved and after consideration of the case, the committee by a majority vote decides on an appropriate action:
  - ✓ Dismiss the grievance.
  - ✓ Uphold the grievance and address it by instructing appropriate reparations including changes in the student's academic record no later than the end of drop/add week of the following semester as indicated in the university academic calendar.
- Decision of the committee is final.

Grievances against dismissal, suspension, and withdrawal from a program/withholding or termination of the scholarship

- The student submits an Appeal Form within three working days from posting the academic standing or posting the decision that led to the withholding or termination of scholarship to the Appeal Committee.
- The student's submission should describe in detail the conditions and factors that led to the perceived grievance and the actions taken during the resolution process.
- The committee investigates and consults with all the parties involved and after consideration of the case decides on an appropriate action as below:
  - ✓ Dismiss the grievance.
  - ✓ Uphold the grievance and address it by instructing appropriate reparations including changes in the student's academic record/ status no later than the end of drop/add week of the following semester as indicated in the university academic calendar.
- Decision of the committee is final.
- The final decision should be communicated to all concerned parties.

Financial obligations:

Financial obligations are calculated based on the below entitlements received by the student according to the rational of appeal:

- 100% paid tuition fees.
- Monthly stipend.
- Accommodation in university dorms/housing allowance.
- Health insurance for expat students.
- Annual ticket allowance for expat students.

The complete withdrawal from the University:

The financial obligations are calculated according to the below and students are requested to settle the payment of:

- Tuition fees of all registered credit hours.
- All previously paid monthly stipends.
- Accommodation allowance if any.
- Cost of the health insurance incurred during tenure of study at MBZUAI.
- Cost of the paid ticket allowance (excluding the onboarding ticket).

Dropping a course after the deadline

If the student requests to drop a course after the deadline while continuing his/her studies, then the financial obligations are calculated according to the below and students are requested to settle the payment of:

- The tuition fees payment of the dropped credit hours only.

Note: the student will still be entitled to all other benefits.

Leave of absence

The student requests to suspend his/her studies for a semester. Therefore, all the scholarship benefits will be terminated for the suspension duration.

When the request is initiated within the deadline, no financial penalties are due. However, when the request is initiated after the deadline, the financial obligations are calculated according to the below and students are requested to settle the payment of:

- The fees of all the registered credit hours of that semester.
- The paid monthly stipend for that semester if any.
- Cost of health insurance for that semester.
- Cost of the paid ticket allowance (excluding the onboarding ticket).

Retake of a course due to failure

If a student fails a course, he/she should repeat the course in the following semester. The financial obligations are calculated according to the below and students are requested to settle the payment of:

- The retaken fees of the repeated credit hours.

- The student is entitled to appeal against the financial obligations pertaining to the above actions to the appeal committee which consists of:
  - The primary supervisor
  - The department chair
  - The Provost
- The committee members discuss and agree to approve/ reject the appeal and on the % of the waiver. The Registrar's Office communicates the final decision with the student, finance department and all parties.
- Below is the students' payment plan of the tuition fees against course withdrawal, leave of absence, and complete withdrawal after the deadline.

No obligations	Within the deadline
Payment of 25% of the tuition fees	**After one week** from the deadline
Payment of 50% of the tuition fees	**After two weeks** from the deadline
Payment of 75% of the tuition fees	**After two weeks** from the deadline
Payment of 100% of the tuition fees	**After four weeks** from the deadline

Program	Fee per one credit hour
M.Sc.	AED5,000
Ph.D.	AED6,600

Student life activities

Student activities

The All student entities and clubs are to be formed and governed by the policies and guidelines drawn up by the Campus Life Department and MBZUAI's vision, mission and strategic objectives.

The Campus Life Department is committed to offering its students extracurricular activities in the areas of culture, recreation, and sports. Extracurricular activities are to be in line with the MBZUAI's policies and procedures.

The Campus life department is committed to providing the facilities, planning, and resources needed to promote approved student activities.

The Campus Life Department will aid in the planning and coordination for the successful execution of student activities. The execution of the activity is the responsibility of the organizer(s).

If the activity is to take place off-campus, prior approval and coordination with the Campus Life Department is mandatory.

Student council

The Graduate Student Council (GSC) at MBZUAI is the elected student body authorized by the university administration to articulate student views and interests and be the voice of students.

Students who stand for election to the council should meet the following requirements:

- Be a full-time graduate student
- Maintain a GPA of 3.5 or above
- Be free from any academic violation
- Be in good financial standing with MBZUAI
- Have completed all admissions criteria
- Should be able to serve one complete year in the position.

The election of the council will take place on campus and will be announced by the Campus Life Department.

Student clubs and groups

The Campus Life Department encourages students to be positive examples of on-campus student leadership. Student clubs are a great way to develop interest and leadership. They empower and enrich students offering them the

opportunity to enhance personal development; while providing excellent networking opportunities with like-minded members of the university community.

Active clubs must meet the following requirements:

- Be MBZUAI enrolled students.
- Register with the Campus Life Department.
- Have at least four main club members.
- Sponsor at least two activities on campus each year. Typical activities could include, but are not limited to, participating in the annual club fair, hosting a fundraiser, coordinating a service project, sponsoring a program or attending a conference.

Community spirit

Our sense of community is well-known as a distinguishing aspect of MBZUAI. It is one of the reasons many students choose to come here. MBZUAI is proud of its strong community spirit, which we foster through close working relationships between students and supervisors, among faculty, and among students.

People volunteer their time, energy, intellect, talent, and other skills to do many of the things that keep our environment running smoothly. These efforts include organizing seminars, maintaining software packages, serving on departmental committees, grading for a graduate course, planning and running social activities, giving tours, and hosting visitors.

Student housing

MBZUAI provides student housing. Living at MBZUAI residences offers students the opportunity to develop their social skills in tandem with their academic potential, while forging lasting friendships and participating in social activities.

Students enrolled at MBZUAI will be entitled to on-campus accommodation for the duration of their study.

Recreation facilities include a variety of options for sports, leisure and cultural activities that exist on campus and in the surrounding Masdar community.

Students will be provided with accommodation containing en-suite facilities, kitchen and living area with internet connection. Facilities on campus for all students include a gym, multipurpose areas for sports activities, restaurants, coffee shops, laundry, plus a canteen that is open for breakfast, lunch, and dinner. Students must collect the key to their on-campus accommodation from the facilities department.

Internships

As of 2023 intake internships are a two credit-bearing experiences that add considerable value to a student's overall educational experience. At least one (1) internship is mandatory for M.Sc. and Ph.D. students as a graduation requirement for 2022 intakes and onwards.

For M.Sc. students, the internship should be conducted during the summer months (mid-May to mid-August), be six weeks in duration and align with the working hours of the host organization. While it is preferable to have the internship relate to the student's research area, it is not a necessary requirement.

For Ph.D. students, the internship is recommended to take place upon completion of the qualifying examination and all required courses. The duration of the internship should be three months during the summer (mid-May to mid-August). The internship should directly relate to the student's research.

The internship shall be conducted with the support of the Career Services and Internships team, the MBZUAI supervisor and industry partner. The criteria and learning outcomes of the M.Sc. internship and Ph.D. internship can be viewed in the MBZUAI Internship Student Guides (The MBZUAI Student Internship Guide Master's Programs and MBZUAI Student Internship Guide PhD Programs, are available via the Career Services and Internships team).

The student may either select an internship opportunity from the MBZUAI Student Careers Portal or discuss with the team if they have found their own opportunity.

The internship should be conducted in-person or follow a hybrid approach (three days in the office and two days virtual/remote).

While discouraged, it is possible to complete the internship requirement via an unpaid research internship at the university. The topic of the research internship should be clearly demarcated from the thesis/ dissertation topic.

Students must attend one of the internship orientation workshops conducted by the Career Services and Internships team.

Regarding evaluation of the internship (for 2022 intakes onwards), the host organization shall complete an internship evaluation form. The student shall submit an internship self-reflection report, and deliver an oral presentation to the MBZUAI supervisor, for which the MBZUAI Supervisor shall award an evaluation of Pass or Fail.

Internship requests from industry partners or MBZUAI students, which differ from the criteria listed above, shall be reviewed on a case-by-case basis with all relevant internal stakeholders. In particular, requests must be agreed in partnership with the student's MBZUAI supervisor, and the Provost's Office, to ensure ongoing priority is given to MBZUAI commitments.

If applicable, necessary measures are put in place to ensure that course learning outcomes will be met, and all assessment tasks satisfactorily completed.

Internship procedure:

If an internship has been secured independently:

- Students should book an appointment with the Career Services and Internships team, who shall support throughout the internship process, including finalizing the details of the internship with the industry partner.

Applying for an internship opportunity via the MBZUAI Student Careers Portal:

- If successfully selected by the industry partner, the student should inform the Career Services and Internships team. The learning outcomes of the internship shall auto-populate the relevant field on the MBZUAI Student Careers Portal, upon selecting the program.
- Students are expected to be diligent, thorough, responsible, and professional with all assigned tasks.
- Students should adhere to the rules and regulations of the company where they are working during the period of the internship.
- Confidentiality in the workplace has to be observed at all times, including posts regarding the company on social media.
- Non-attendance must be reported to both the host organization and the Career Services and Internships team.
- Students should try, when possible, to arrange medical appointments out of work hours. Sick leave letters should be submitted to both the host organization and the Career Services and Internships team.
- Students should dress and behave in a professional manner, in accordance with the organization's dress code.
- Students should track hours completed via the MBZUAI Student Careers Portal.

Upon completing the internship:

- The host organization shall be asked to submit the Industry Partners Evaluation Form to the Career Services and Internships team.
- Students will be asked to complete a post-internship self-reflection report and deliver an oral presentation to their MBZUAI supervisor. Please review the relevant MBZUAI Internships Students Guide (M.Sc. or Ph.D.).

Please note that receiving payment or an appreciation certificate is decided by the host organization.

For more information, please email: Careerservices@mbzuai.ac.ae

Career Services and Internships team

The Career Services and Internships team aims to empower students and graduates to access AI-related internship and employment opportunities by offering a high-quality personalized service.

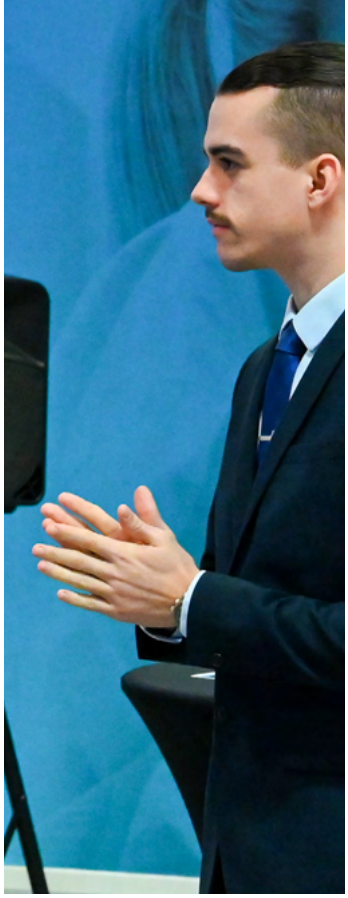
Students will have the opportunity to explore career options through the provision of accurate and relevant information on AI career pathways and up-to-date labor market information.

Students shall be able to book individual appointments via the MBZUAI Student Careers Portal to review career needs and identify realistic courses of action to follow-up including developing, evaluating and implementing education, employment, career, entrepreneurial decisions and plans.

Students shall receive support with developing professional materials (resumes, cover letters, internship/job applications, LinkedIn, and e-portfolios).

The Career Services and Internships team will facilitate opportunities for employer engagement including (but are not limited to):

- An annual internship and opportunities fair.
- Interviews with industry partners and relevant research organizations
  - Networking events – engagement in conversations with professionals from AI
  - Industry partner sessions – organizations sharing industry knowledge and company insights.
- A range of workshops will be offered to help students develop their employability skills and obtain appropriate internship and employment opportunities such as networking skills, job search strategies and mock interview preparation.



- Students shall have access to a database of internship and job opportunities via the MBZUAI Student Careers Portal, achieved through close partnerships with industry. Signposting to other departments and agencies as appropriate will be offered (for example, personal counseling).
- The Career Services and Internships team will develop and recommend appropriate AI-related information and resources.

What is expected from students using the service?

Students are expected to keep confirmed appointments with the Career Services and Internships team. Students should advise the team, 24 hours prior to the appointment, if they are unable to attend.

Students are expected to keep confirmed appointments with industry partners, such as on-campus/ off-campus or virtual interviews. Students should advise the Career Services and Internships team, 24 hours prior to the interview, if they are unable to attend.

Students are requested to represent MBZUAI in a professional manner, and for professional materials such as their resume/LinkedIn account to be approved by the Career Services and Internships team prior to sharing with industry partners. Students can review appropriate resources via the MBZUAI Student Careers Portal, MS Stream and the MBZUAI Student Opportunities LinkedIn page, prior to attending an industry partners event and/or interview.

Students are asked to respond to requests for information as needed, for example, up-to-date / accurate student information, internship, employment and graduation data.

Research matters

MBZUAI is an independent government entity and will ensure that it offers the highest possible standard of excellence and autonomy in research and thought leadership to all those associated with the university, whether students, faculty members or researchers.

MBZUAI creates and disseminates insightful and state-of-the-art research output in artificial intelligence and its numerous applications within the region and internationally.

Academic research initiatives are conducted by the academic affairs division, whereas the non- academic research initiatives are overseen mainly by the outreach department, supported by the research division, in collaboration with UAE public entities, external organizations or UAE external individuals.

Students work on research projects under the guidance of their supervisors, who are domain experts in their fields among MBZUAI faculty members.

MBZUAI students shall be bound by confidentiality regulations, as defined by the applicable laws and regulations in UAE in matters related to internal research projects (commissioned and non-commissioned).

Student conduct

Students should conduct themselves in a manner that contributes positively to the university environment in which respect, civility, diversity, opportunity, and inclusiveness are valued. They are expected to act honestly and responsibly and respect the University regulations, policies and guidelines to assure the success of both the individual and the community. Any student at MBZUAI must respect other students, faculty members, staff and the public.

The Code of Conduct sets out the right and responsibilities of students at MBZUAI.

The purpose of the code is to:

- Inform students of their rights and responsibilities.
- Define the general standard of conduct expected of students.
- Provide examples of conduct that may be subject to disciplinary action.
- Clarify the procedures that the University will follow to address allegation and cases of non-academic misconduct.
- Provide examples of disciplinary measures and potential sanctions that may be imposed by the University in case of violations.
- Students are expected to be aware of, and to conduct themselves in accordance with the code.

Library

MBZUAI has an equipped library and technological resource on campus to assist students in the effective completion of their academic work and research assignments. The following facilities are available to students on campus: library, technology, and computer-based services and research laboratories.

The MBZUAI library provides print and electronic resources, facilities, and services to support the academic, research and professional information needs of the students, faculty, and staff of MBZUAI.

Membership

The library is open for the purpose of study and research to enrolled MBZUAI students, current faculty and staff, alumni, visiting researchers, and approved guests.

Collections

Collection development focuses on scholarly and academic publications in the interdisciplinary field of artificial intelligence, and additional resources are collected to support professional, teaching and learning needs and interests. All resources are discoverable through the library's single-search interface and materials available for borrowing include books, periodicals, course reserve materials and equipment.

- Physical collections are classified and arranged according to the Library of Congress Classification System.
- Open collections (main collection, reference, and periodicals) are browsable.

- Access to closed collections (course reserve collections) is mediated by library staff.
- Licensed electronic resources include bibliographic and full-text content and are available and accessible through university-provided credentials.
- Access to faculty open access affiliated publications and MBZUAI student theses and dissertations is available through the institutional repository, eCommons.

- Multiple copies of student textbooks are not typically purchased by the library; however, the library maintains a limited number of copies of required textbooks that are only available in print and makes these available on course reserve (short-term loans) to students.
- Access to electronic textbooks is available through library eBook platforms or eRental platforms. Links to these resources are provided on the learning management system (Moodle) or directly through the library portal.

Facilities

The library provides stable Wi-Fi, study space, printing and scanning facilities, access to course reserve and other collections, and an opportunity to consult in person with library staff on resource and research needs.

Services

Students are provided with personal library accounts (My Account) to renew books, place holds, review outstanding fines and fees, and create booklists. Other eServices include title recommendations and requests, interlibrary loan requests, and resource and research consultations.

Librarians provide research and resource support, publish online guides, and host instruction through scheduled sessions and individual consultations, onsite and online.

Inter-library loans (ILL) and document delivery services are available to support students' resource needs not met by the library, and if available from a partner library or document delivery service.

Quotas may be applied, and materials obtained through ILL are strictly intended for individual use.

An institutional repository, eCommons, is maintained by the library to curate and disseminate faculty scholarship and MBZUAI student theses and dissertations. Students are required to submit a digital copy of a correctly formatted and approved thesis/dissertation to meet graduation requirements.

Loan rules and periods

Student identification is required to borrow physical materials and university-provided credentials are required to access licensed electronic content.

- Main collection material is available for long-term borrowing (three weeks or longer) by enrolled students, faculty, and staff of MBZUAI.
- High demand material, including course reserve items and equipment, is available for short-term borrowing and access may be restricted to in-library use.
- Items located in reference, periodicals, special collections, and archives are normally not available for circulation outside the library (non-circulating).
- Electronic content may have indefinite or varying periods of loan and can be accessed via the library's website or individual URL links provided on the learning management system (Moodle).

Materials are checked out and returned at staffed circulation desks. All patrons remain responsible for items checked out in their names.

- Overdue notices are sent as a courtesy.
- Fines may be levied for the late return of items, in accordance with notices displayed in the library and on the library's website and are charged at rates determined and approved annually by the Academic Committee.

- Fines will continue to accumulate until an item is returned or reported missing, and up to 20 days for long- term loans and 50 hours for short-term loans, at which stage, patrons will receive a statement for the replacement cost, including administrative charges and accumulated fines. Exceptions may apply.
- Students are required to clear all outstanding fines and fees directly with the finance department and borrowing privileges will be suspended for students with outstanding fines and fees of AED 300 or more.
- Items that may not be renewed online through the My Account service include recalled and overdue items, course reserve items, and books borrowed from another library (interlibrary loans).
- Patrons may request a hold on an item currently checked out to another patron and the library reserves the right to recall an item. All items may be recalled for inventory purposes at the end of each semester.

All borrowing policies and fines are published on the Library website > Services > Borrowing policies.

Library hours

Library opening hours support access to physical resources, facilities, and services and are posted on the library website.

Use of resources and facilities

Students are expected to acquaint themselves with the library's policies and regulations and refrain from any behavior that interferes with the right of others to access resources or use the library for the purpose of research and study. Library staff are empowered to interpret and enforce library policies, suspend privileges, and refer serious breaches of conduct to the Director of Educational Affairs.

- Facilities and equipment, including the library computers, are intended to support MBZUAI academic and research programs and use may be mediated to ensure equitable access and appropriate use.
- The use of computing and network resources, and licensed electronic resources must comply with the university's policies, licenses, contracts, and applicable laws.
- The use of the library's printing and scanning equipment for the reproduction of copyright-protected material requires compliance with copyright laws and conventions.
- Posting notices, taking photos or video recording in the library, requires permission from the Head of Library Management.
- With the exception of covered drinks (for example, coffee and tea), food and drinks should not be consumed in the library, and single-use plastic is discouraged.

For more information, please refer to the MBZUAI Library Resources and Services Policy.

Research labs

Our research labs boast a robust infrastructure of 96 powerful workstations, each equipped with powerful NVIDIA Quadro RTX GPUs, ample data storage capabilities, and a comprehensive suite of commercial and academic software specifically designed for AI, data-intensive processing. These resources are tailored to meet the diverse academic and research needs of our students, providing them with cutting-edge technology to support their coursework, experiments, simulations, and data analytics tasks.

Three types of labs will be available:

Data Acquisition Lab

Deployed with special equipment with the latest technology such as camera systems, thermal imagers, dynamic vision sensors, acquisition systems, and drones.

Data Observatory Center

Equipped with high-resolution video walls incorporating latest visualization technologies to support the delivery of research and educational products.

Administration and important information

UAE entry permit and residency visa

MBZUAI Students must have a valid entry visa to enter the UAE (depending on their nationality). This permit will be issued and sent prior to leaving home. The validity of the visa depends on rules at the current time; they may be valid for 30 or 60 days from the date of issue. Therefore, entry to the UAE must be within this period.

For the initial processing of the entry permit(s) and insurance procedures, students will need to send the education certificate (bachelor's/ master's), photocopy of the passport, and color passport photo with white background. Please send the requested documents to admission@mbzuai.ac.ae.

It should be noted that there should be at least six months' validity on passports for entry into the UAE and application for the residence visa.

When all the relevant documents have been received, the admissions office will process and email a copy of the entry permit(s).

Students will need to show a copy of the entry permit to the airline/ immigration at their point of departure. Students with certain nationalities must undergo a pre-medical test and pre-approval for the entry permit in the home country through the UAE consulate before their departure.

Upon arrival in the UAE, a public relations officer (PRO) will handle the residence visa procedures. The residence visa will be stamped on the passport.

To start these procedures, students should report to Campus Life office, as soon as possible after their arrival, with the following documents:

- Original entry permit
- Passport

A PRO will book an appointment for the medical test, Emirates ID application typing, fingerprint scan (for the Emirates ID), and issue health insurance to complete the required documents for the residence visa.

Emirates ID card

As per the law of the Population Registry and the Identity Card program, all nationals and legal residents of the UAE must obtain the Emirates ID card.

Students will be required to obtain an Emirates ID card for themselves and MBZUAI will reimburse the cost of the Emirates ID card.

For further information, please see www.emiratesid.ae.

Driving license

To obtain a driving license, students should visit the Abu Dhabi Police Department's Office. Regulations for obtaining a driving license vary by nationality. Therefore, this department will advise of the latest regulations and provide guidance regarding the process required for obtaining a driving license.

Note: Students can only apply for a driving license when they have obtained their residence visa.

Embassies and consulates

There are many foreign embassies and consulates located in Abu Dhabi and Dubai.

Embassies and consulates are generally open from 8:45 a.m. to 1:30 p.m, Monday to Friday. Some may close early on Fridays.

Some embassies have websites while others do not. For a comprehensive list of embassies and consulates in the UAE, please see: www.indexuae.com/Top/Government/Embassies_and_Consulates.

Electricity

Electricity is 220 volts at 50 cycles per second. Transformers are readily available in the market for electronic equipment that runs on 110 volts. If students bring their personal computer for use in their home, they will need to purchase a transformer. Some computers switch either manually or automatically from 110 to 220 volts.

UAE newspapers

Newspapers are readily available in both English and Arabic, and delivery is available to campus housing. To view the comprehensive list of available newspapers, please view the following link: http://www.onlinenewspapers.com/une.htm

Potable water

Tap water in the Emirates is safe to drink. However, most people prefer bottled water, which can be delivered to individual accommodations weekly, at a cost of approximately 10 dirhams per five-gallon bottle.

Useful websites

For additional information on working and living in the UAE, the following websites will prove useful:

http://visitabudhabi.ae/en/default.aspx

https://www.abudhabi.ae/portal/public/en/homepage

Dress code

MBZUAI has a multicultural environment that respects the norms of UAE society. Students must not behave or dress in a way that may offend cultural sensitivities. The following points must be observed regarding student dress at the university.

- No offensive wording, drawings, or pictures are allowed on clothing.
- Clothing or attire must not interfere with the safe operation of duties or equipment.
- In respect for the needs for identification and security, we request all female students to forgo face-covering veils while on campus.
- Students should not wear revealing clothes. “Revealing clothes” refers to clothing that has very sheer fabric or clothing that is tight. Blouses, etc should have no cleavage visible. The lower back, abdomen and upper arms should be covered. Skirts should be below the knee.
- All students are to wear appropriate business attire when representing the University on official trips such as conferences, summits and meetings with external organizations.

Examples of acceptable clothing:

- **Female students** – UAE National attire, long skirts/pants/dresses with length that covers the knees, long-sleeve blouses, smart T-Shirts, jumpers, jackets, and suits (note: no sleeveless).
- **Male students** – UAE National attire, business suits, sports jackets, blazers, trousers/slacks, smart T-shirts and shirts.

Curriculum Changes

All MBZUAI programs are subject to change. MBZUAI adheres to a curriculum development policy that encompasses all changes, additions and/or eliminations with respect to academic programs and credit-bearing courses in academic programs. The program and curriculum development, approval and revision section of the Academic Programs Policy provides a framework to guide decisions regarding MBZUAI’s academic program development, delivery, assessment, and improvement.

ACADEMIC PROGRAMS

Master of Science | Doctor of Philosophy

Master of Science in **Computer Science**

CS

Mode Full-time

Credits 36

Location On-campus

Program Aims

The goals of the Master of Science in Computer Science are to train specialists to (1) analyze complex computer science and AI problems, (2) take a scientific, innovative, ethical, and socially responsible approach to conducting and contributing to computer science research, and (3) solve complex problems in the field. As technological progress accelerates, so does the demand for skilled computer science professionals. The Master of Science in Computer Science is intended for students desiring to substantially advance their knowledge and skill in a field or fields of computer science. Students will be supervised and mentored by faculty members with world-class expertise in a variety of areas in computer science, including algorithms, systems, and computational intelligence. This master's program is ideally suited to students wishing to become senior professionals in the technology industry or to those seeking to prepare for a career in scientific research.

National Qualifications Framework – five strands

The program learning outcomes (PLOs) are aligned with the Emirates Qualifications Framework and, as such, are divided into the following learning outcomes strands: Knowledge (K), Skills (S), Autonomy and responsibility (AR), Role in context (RC) and Self-development (SD).

Program learning outcomes

Upon completion of the program requirements, graduates will be able to:

1. Analyze real-world problems and apply principles of computer science and other relevant disciplines to meet desired needs (Knowledge, Skill, Autonomy and Responsibility, Role in Context, and Self-development).
2. Analyze and prove the properties of data structures, algorithms and/or computing systems using the theoretical underpinnings of computer science (Knowledge, Skill, Autonomy and Responsibility, and Self-development).
3. Identify and apply mathematical foundations, algorithmic principles, and computer science theory in the modelling and design of computer-based systems (Knowledge, Skill, and Self-development).
4. Function effectively as a member and leader of a team engaged in computer science projects and research of varying complexity (Skill, Autonomy and Responsibility, Role in Context, and Self-development).
5. Communicate the practical and entrepreneurial feasibility and sustainability of research findings and innovations, orally and in written form, to both specialist and general audiences (Skill)

The PLOs are mapped to a level nine (9) qualification according to the five strands of learning outcomes as per the National Qualifications Framework set by the UAE National Qualifications Authority (NQA) and the Ministry of Education (MoE):

Program learning outcomes	Knowledge	Skill	Aspects of competence		
			Autonomy and responsibility	Role in context	Self-development
PLO1	**K-1, 2, 3L9**	S-1, 3L9	AR-1, 3L9	RC-1L9	SD-3L9
PLO2	K-4L9	S-1L9	AR-3L9	-	SD-1L9
PLO3	K-1, 2L9	S-2L9	-	-	SD-1, 2L9
PLO4	-	S-1L9	AR-1, 2L9	RC-2L9	SD-3L9
PLO5	-	S-4L9	-	-	-

Aligning PLOs for Master of Science in Robotics to QF Emirates Level 9 Framework.

Program study plan

Students are expected to complete coursework in the first year of degree and focus more on the research project and thesis writing in the second year. However, this is an indicative plan and students have the flexibility to take a light course load in the second year as well and, similarly, can start research in the first year (e.g., literature review, background study, data collection or initial framework design) with the approval of their supervisory panel.

A typical study plan is as follows:

SEMESTER 1	
CS701	Advanced Algorithms and Data Structures

MTH703	Mathematics for Theoretical Computer Science
CS702	Theory of Computer Science
SEMESTER 2	
CS703	Operating Systems + two electives
SUMMER	
INT799	Internship (up to six weeks)
SEMESTER 3	
RES799	Introduction to Research Methods
CS799	Master's Research Thesis
SEMESTER 4	
CS799	Master's Research Thesis

Program degree requirements

Completion requirements:

The minimum degree requirements for the Master of Science in Robotics is 36 credits, distributed as follows:

Core courses	Number of courses	Credit hours
Core	4	16
Electives	2	8
Internship	1	2
At least one internship of up to six weeks duration must be satisfactorily completed as a graduation requirement		
Research Methods	1	2
Research thesis	1	8

Program courses

Core courses

The Master of Science in Computer Science is primarily a research-based degree. The purpose of coursework is to equip students with the right skillset, so that they can successfully accomplish their research project (thesis). Students are required to take MTH703, CS701, CS702, CS703, RES799 and INT799 as mandatory courses. They can select two electives. To accommodate a diverse group of students, coming from different academic backgrounds, students have been provided with flexibility in course selection.

The decision on the courses to be taken will be made in consultation with students' supervisory panel, which will comprise two or more faculty members. Essentially, the student's supervisory panel will help design a personalized coursework plan for each individual student by looking at their prior academic track record and experience, and the planned research project. For full descriptions of courses, please refer to Appendix 1: Course descriptions.

The following core courses must be taken by all students:

Code	Course title	Credit hours
CS701	Advanced Algorithms and Data Structures	4
MTH703	Mathematics for Theoretical Computer Science	4
CS702	Theory of Computer Science	4

CS703	Operating Systems	4
INT799	Internship	2
RES799	Introduction to Research Methods	2

Elective courses

Students will select a minimum of two elective courses, with a total of eight (or more) credit hours based on interest, proposed research thesis, and career aspirations, in consultation with their supervisory panel. The elective courses available for the Master of Science in Robotics are listed in the tables below. For full descriptions of courses, please refer to Appendix 1: Course descriptions.

Code	Course title	Credit hours
CS704	Programming Languages and Implementation	4
CS705	Distributed and Parallel Computing	4
DS701	Data Mining	4
DS702	Big Data Processing	4
NLP701	Natural Language Processing	4
NLP702	Advanced Natural Language Processing	4
NLP703	Speech Processing	4
ROB701	Introduction to Robotics	4

Research thesis

The Master's Thesis research exposes students to an unsolved research problem, where they are required to propose new solutions and contribute towards the body of knowledge. Students pursue an independent research study, under the guidance of a supervisory panel, for a period of one year. For further details on the research thesis, please refer to Appendix 1: Course descriptions.

Code	Course name	Credit hours
CS799	Master's Research Thesis	8

We are
innovators and
future leaders in **AI**

Master of Science in **Computer Vision**

CV

Mode Full-time

Credits 36

Location On-campus

Program Aims

The goals of the Master of Science in Computer Vision are to train specialists to (1) analyze complex problems within the field of computer vision (2) take a scientific, innovative, ethical, and socially responsible approach to conducting and contributing to research, and (3) solve complex problems in the field. This scientific field studies how computers can be used to automatically understand and interpret visual imagery. It aims to mimic the astounding capabilities of human visual cortex using machine vision algorithms. It studies how an image is created, the geometry of the 3D world and high-level tasks such as object recognition, object detection, and tracking, image segmentation and action recognition. Computer vision has important applications in augmented/virtual reality, autonomous cars, service robots, biometrics and forensics, remote sensing and security and surveillance.

National Qualifications Framework – five strands

The program learning outcomes (PLOs) are aligned with Emirates Qualifications Framework and as such are divided into the following learning outcomes strands: Knowledge (K), Skills (S), Autonomy and responsibility (AR), Self-development (SD), and Role in context (RC).

Program learning outcomes

Upon completion of the program requirements, graduates will be able to:

1. Demonstrate highly specialized knowledge of computer vision in line with the underlying mathematical and computational principles (Knowledge and Autonomy & Responsibility).
2. Perform critical literature survey and develop new ideas by integrating multidisciplinary knowledge (Knowledge and Skill).
3. Apply advanced problem-solving skills to analyze, design and execute solutions for the existing and new problems in computer vision faced by both industry and academia (Knowledge, Skill and Autonomy & Responsibility).
4. Initiate, manage and complete multifaceted computer vision projects and clearly communicate concepts, complex ideas, and conclusions both orally and in the form of technical reports (Skill and Role in context).
5. Function independently and in a team to address computer vision problems under complex and unpredictable real-world settings (Skill, Autonomy and responsibility).
6. Contribute to cutting-edge computer vision research to produce new knowledge or take responsibility to lead innovative and impactful computer vision projects in industry (Knowledge, and Skill).
7. Manifest the right learning attitude during coursework and research that clearly shows ownership, personal and technical growth, and responsibility (Autonomy and responsibility and Self-development).
8. Articulate legal, ethical, environmental, and socio-cultural ramifications of computer vision technologies, and take a lead in making informed and fair decisions on complex issues (Autonomy and responsibility, and Self-development).

The PLOs are mapped to a level nine (9) qualification according to the five strands of learning outcomes as per the National Qualifications Framework set by the UAE National Qualifications Authority (NQA) and the Ministry of Education (MoE):

Program learning outcomes	Knowledge	Skill	Aspects of competence		
			Autonomy and responsibility	Role in context	Self-development
PLO1	K-1L9	-	AR-1L9	-	-
PLO2	K-2,4L9	S-1,2L9	-	-	-
PLO3	K-2L9	S-1,2,3L9	AR-2L9	-	-
PLO4	-	S-1,2,3,4L9	AR3L9	RC-1L9	-
PLO5	-	S-2,4L9	AR-1L9	RC-1,2L9	SD-1L9
PLO6	K-3L9	S-1,3L9	-	-	-
PLO7	-	-	AR-2,3L9	RC-2L9	SD-1,2L9
PLO8	-	-	AR-1,3L9	RC-1L9	SD-3L9

Aligning PLOs for Master of Science in Computer Vision to QF Emirates Level 9 Framework.

Program study plan

The students are expected to complete coursework in the first year of the degree and focus more on the research project and thesis writing in the second year. However, this is an indicative plan and students have the flexibility to take a light course load in the second year as well and similarly can start research in the first year (e.g., literature review, background study, data collection or initial framework design) with the approval of their supervisory panel.

A typical study plan is as follows:

SEMESTER 1	
AI701	Foundations of Artificial Intelligence
MTH701	Mathematical Foundations of Artificial Intelligence
CV701	Human and Computer Vision
SEMESTER 2	
CV702	Geometry for Computer Vision **OR**
CV703	Visual Object Recognition and Detection
	+ 2 electives
SUMMER	
INT 799	Internship
SEMESTER 3	
RES799	Introduction to Research Methods
CV799	Computer Vision Masters Research Thesis
SEMESTER 4	
CV799	Computer Vision Masters Research Thesis

Program degree requirements

Completion requirements:

The minimum degree requirements for the Master of Science in Computer Vision is 36 credits, distributed as follows:

Core courses	Number of courses	Credit hours
Core	4	16
Electives	2	8
Internship	1	2
Intro to Research	1	2
Research thesis	1	8

Program courses

Core courses

The Master of Science in Computer Vision is primarily a research-based degree. The purpose of coursework is to equip students with the right skillset, so they can successfully accomplish their research project (thesis). Students are required to take AI701, MTH701 and CV701 as mandatory courses. They can select either CV702 or CV703 along with two electives. To accommodate a diverse group of students, coming from different academic backgrounds, students have been provided with flexibility in course selection. The decision on the courses to be taken will be made in consultation with the students' supervisory panel, which will comprise of two or more faculty members. Essentially, the student's supervisory panel will help design a personalized coursework plan for each individual student, by looking at their prior academic

track record and experience, and the planned research project.

For full descriptions of courses, please refer to *Appendix 1: Course descriptions.*

The following core courses must be taken by all students:

Code	Course title	Credit hours
AI701	Foundations of Artificial Intelligence	4
MTH701	Mathematical Foundations of Artificial Intelligence	4
CV701	Human and Computer Vision	4
CV702	Geometry for Computer Vision **OR**	4
CV703	Visual Object Recognition and Detection	4

Elective courses

Students will select a minimum of two elective courses, with a total of eight (or more) credit hours, based on interest, proposed research thesis, and career aspirations, in consultation with their supervisory panel. The elective courses available for the Master of Science in Computer Vision are listed in the tables below. For full descriptions of courses, please refer to Appendix 1: Course descriptions.

Code	Course title	Credit hours
CV702	Geometry for Computer Vision	4
CV703	Visual Object Recognition and Detection	4
CV707	Digital Twins	4
HC701	Medical Imaging: Physics and Analysis	4
AI702	Deep Learning	4
DS701	Data Mining	4
DS702	Big Data Processing	4
ML701	Machine Learning	4
ML703	Probabilistic and Statistical Inference	4
ML707	Smart City Services and Applications	4
ML708	Trustworthy Artificial Intelligence	4
ML709	IoT, Smart Systems, Services and Applications	4
NLP701	Natural Language Processing	4
NLP702	Advanced Natural Language Processing	4
NLP703	Speech Processing	4
ROB701	Introduction to Robotics	4

Research thesis

Master's thesis research exposes students to an unsolved research problem, where they are required to propose new solutions and contribute towards the body of knowledge. Students pursue an independent research study, under the guidance of a supervisory panel, for a period of one year.

For further details on the research thesis, please refer to Appendix 1: Course descriptions.

Code	Course title	Credit hours
CV799	Computer Vision Master's Research Thesis	8
RES799	Introduction to Research Methods	2

Master of Science in **Machine Learning**

ML

Mode Full-time | **Credits** 36 | **Location** On-campus

Program Aims

The goals of the Master of Science in Machine Learning are to train specialists to (1) analyze complex problems within the field of ML, (2) take a scientific, innovative, ethical, and socially responsible approach to conducting and contributing to research, and (3) solve complex problems in the field.The scientific study of algorithms and statistical models that computer systems use to effectively perform a specific task without using explicit instructions, relying on patterns and inference instead. These algorithms are based on mathematical models learned automatically from data, thus allowing machines to intelligently interpret and analyze input data to derive useful knowledge and arrive at important conclusions. Machine learning is heavily used for enterprise applications (e.g., business intelligence and analytics), effective web search, robotics, smart cities and understanding of the human genome.

National Qualifications Framework – five strands

The program learning outcomes (PLOs) are aligned with Emirates Qualifications Framework and as such are divided into the following learning outcomes strands: Knowledge (K), Skills (S), Autonomy and responsibility (AR), Self-development (SD), and Role in context (RC).

Program learning outcomes

Upon completion of the program requirements, graduates will be able to:

1. Explain the modern machine learning pipeline: data, models, algorithmic principles, and empirics. (Knowledge)
2. Employ data-preprocessing and various exploration and visualization tools. (Skill)
3. Identify and differentiate the capabilities and limitations of the different forms of learning algorithms. (Knowledge and Skill)
4. Critically analyze, evaluate, and continuously improve the performance of the learning algorithms. (Knowledge, Skill, Autonomy & Responsibility and Self-Development)
5. Analyze computational and statistical properties of advanced learning algorithms and their performance. (Knowledge and Skill)
6. Apply and deploy ML-relevant programming tools for a variety of complex ML problems. (Skill and Autonomy & Responsibility)
7. Problem-solve through independently applying machine learning methods to multiple. often ambiguous, complex problems. (Knowledge, Skill, Autonomy and responsibility, and Role in context and Self-development)
8. Apply sophisticated skills in initiating, managing, completing, and communicating multiple project reports, highly complex ideas, and critiques on variety of machine learning methods using innovative and sustainable approaches. (Knowledge, Skill Autonomy and responsibility, Role in context, and Self-development)

The PLOs are mapped to a level nine (9) qualification according to the five strands of learning outcomes as per the National Qualifications Framework set by the UAE National Qualifications Authority (NQA) and the Ministry of Education (MoE):

Program Learning Outcomes	Knowledge	Skill	Aspects of competence		
			Autonomy and responsibility	Role in context	Self-development
PLO1	K-1L9	-	-	-	-
PLO2	-	S-3L9	-	-	-
PLO3	K-1,3L9	S-2L9	-	-	-
PLO4	K-3L9	S-1,2L9	AR-1,3L9	-	SD-2L9
PLO5	K-3L9	S-1,2L9	-	-	-
PLO6	-	S-3L9	AR-1L9	-	SD-3L9
PLO7	K-2,4L9	S-2,3L9	AR-1,2L9	RC-2L9	SD1,3L9
PLO8	K-2L9	S-3,4L9	-	RC-1L9	-

Aligning PLOs for Master of Science in Machine Learning to QF Emirates Level 9 Framework.

Program study plan

The students are expected to complete coursework in the first year of degree and focus more on the research project and thesis writing in the second year.

However, this is an indicative plan and students have the flexibility to take a light course load in the second year as well and similarly can start research in the first year (e.g., literature review, background study, data collection or initial framework design) with the approval of their supervisory panel.

A typical study plan is as follows:

SEMESTER 1	
AI701	Foundations of Artificial Intelligence
MTH701	Mathematical Foundations of Artificial Intelligence
ML701	Machine Learning
SEMESTER 2	
ML703	Probabilistic and Statistical Inference
	+ 2 electives
SUMMER	
INT 799	Internship
SEMESTER 3	
RES799	Introduction to Research Methods
ML799	Machine Learning Master's Research Thesis
SEMESTER 4	
ML799	Machine Learning Master's Research Thesis

Program degree requirements

Completion requirements:

The minimum degree requirements for the Master of Science in Machine Learning is 36 credits, distributed as follows:

Core courses	Number of courses	Credit hours
Core	4	16
Electives	2	8
Internship	1	2
Introduction to Research	1	2
Research thesis	1	8

Program courses

Core courses

The Master of Science in Machine Learning is primarily a research-based degree. The purpose of coursework is to equip students with the right skillset, so they can successfully accomplish their research project (thesis). Students are required to take AI701, MTH701, ML701 and ML703 as mandatory course, along with two electives. To accommodate a diverse group of students, coming from different academic backgrounds, students have been provided with flexibility in course selection. The decision on the courses to be taken will be made in consultation with the students' supervisory panel, which will comprise of two or more faculty members. Essentially, the student's supervisory panel will help design a personalized coursework plan for each individual student, by looking at their prior academic track record and experience, and the planned research project.

For full descriptions of courses, please refer to Appendix 1: Course descriptions.

The following core courses must be taken by all students:

Code	Course title	Credit hours
AI701	Foundations of Artificial Intelligence	4
MTH701	Mathematical Foundations of Artificial Intelligence	4
ML701	Machine Learning	4
ML703	Probabilistic and Statistical Inference	4

Elective courses

Students will select a minimum of two elective courses, with a total of eight (or more) credit hours, based on interest, proposed research thesis, and career aspirations, in consultation with their supervisory panel. The elective courses available for the Master of Science in Machine Learning are listed in the tables below. For full descriptions of courses, please refer to Appendix 1: Course descriptions.

Code	Course title	Credit hours
AI702	Deep Learning	4
CV701	Human and Computer Vision	4
CV702	Geometry for Computer Vision	4
CV703	Visual Object Recognition and Detection	4
CV707	Digital Twins	4
DS701	Data Mining	4
DS702	Big Data Processing	4
DS703	Information Retrieval	4
DS704	Statistical aspect of Machine Learning / Statistical Theory	4
HC701	Medical Imaging: Physics and Analysis	4
ML707	Smart City Services and Applications	4
ML708	Trustworthy Artificial Intelligence	4
ML709	IoT, Smart Systems, Services and Applications	4
MTH702	Optimization	4
NLP701	Natural Language Processing	4
NLP702	Advanced Natural Language Processing	4
NLP703	Speech Processing	4
ROB701	Introduction to Robotics	4

Research thesis

Master's thesis research exposes students to an unsolved research problem, where they are required to propose new solutions and contribute towards the body of knowledge. Students pursue an independent research study, under the guidance of a supervisory panel, for a period of one year.

For further details on the research thesis, please refer to Appendix 1: Course descriptions.

Code	Course title	Credit hours
ML799	Master's Research Thesis	8
RES799	Introduction to Research Methods	2

Master of Science in **Natural Language Processing**

NLP

Mode
Full-time

Credits
36

Location
On-campus

Program Aims

The goals of the Master of Science in Natural Language Processing are to train specialists to (1) analyze complex problems within the field of NLP, (2) take a scientific, innovative, ethical, and socially responsible approach to conducting and contributing to research, and (3) solve complex problems in the field.

NLP focuses on system development that allows computers to communicate with people using everyday language. Natural language generation systems convert information from the computer database into readable or audible human language and vice versa. Such systems also enable sophisticated tasks such as inter-language translation, semantic understanding, text summarization, and holding a dialog. The key applications of NLP algorithms include interactive voice response applications, automated translators, digital personal assistants (e.g., Siri, Cortana, Alexa), chatbots, and smart word processors.

National Qualifications Framework – five strands

The program learning outcomes (PLOs) are aligned with Emirates Qualifications Framework and as such are divided into the following learning outcomes strands: Knowledge (K), Skills (S), Autonomy and responsibility (AR), Self-development (SD), and Role in context (RC).

Program learning outcomes

Upon completion of the program requirements, graduates will be able to:

1. Analyze and model textual and speech data with applications to real-world scenarios. (Knowledge, Skill and Autonomy & Responsibility)
2. Identify and explain the syntactic and semantic structures in speech and textual data (e.g., the predicate-argument structure). (Knowledge and skill)
3. Implement cutting-edge NLP algorithms and benchmark the achieved results. (Knowledge, Skill, Role in context and Self-development)
4. Formulate own research questions, analyze the existing body of knowledge, propose, and develop solutions to new problems. (Knowledge, Skill and Autonomy and responsibility)
5. Use and deploy NLP related programming tools for a variety of NLP problems. (Knowledge and Self-development)
6. Work independently as well as part of a team, in a collegial manner, on NLP related projects. (Skill, Autonomy and responsibility, Role in Context and Self-Development)
7. Effectively communicate the feasibility and sustainability of experimental results, innovations and research findings orally and in writing, and critique existing body of work. (Knowledge, Skill and Role in context)

The PLOs are mapped to a level nine (9) qualification according to the five strands of learning outcomes as per the National Qualifications Framework set by the UAE National Qualifications Authority (NQA) and the Ministry of Education (MoE):

Program Learning Outcomes	Knowledge	Skill	Aspects of competence		
			Autonomy and responsibility	Role in context	Self-development
PLO1	**K-1L9**	S-1L9	Ar-1,3L9	-	-
PLO2	K-2L9	S-4L9	-	-	-
PLO3	K-2L9	S-2L9	-	**RC-1L9**	SD-2L9
PLO4	K-2,4L9	S-1,2,4L9	AR-1,3L9	-	-
PLO5	K-4L9	-	-	-	**SD-3L9**
PLO6	-	S-2L9	AR-1,2L9	**RC-1L9**	SD-1L9
PLO7	K-3L9	S-1,4L9	-	-	-

Aligning PLOs for Master of Science in Natural Language Processing to QF Emirates Level 9 Framework.

Program study plan

The students are expected to complete coursework in the first year of their degree and focus more on the research project and thesis writing in the second year. However, this is an indicative plan and students have the flexibility to take a light course load in the second year as well and similarly can start research in the first year (e.g., literature review, background study, data collection or initial framework design) with the approval of their supervisory panel.

A typical study plan is as follows:

SEMESTER 1	
AI701	Foundations of Artificial Intelligence
MTH701	Mathematical Foundations of Artificial Intelligence
NLP701	Natural Language Processing
SEMESTER 2	
NLP702	Advanced Natural Language Processing
	+ 2 electives
SUMMER	
INT 799	Internship
SEMESTER 3	
RES799	Introduction to Research Methods
NLP799	Natural Language Processing Master's Research Thesis
SEMESTER 4	
NLP799	Natural Language Processing Master's Research Thesis

Program degree requirements

Completion requirements:

The minimum degree requirements for the Master of Science in Natural Language Processing is 36 credits, distributed as follows:

Core courses	Number of courses	Credit hours
Core	4	16
Electives	2	8
Internship	1	2
Intro to Research	1	2
Research thesis	1	8

Program courses

Core courses

The Master of Science in Natural Language Processing is primarily a research-based degree. The purpose of coursework is to equip students with the right skillset, so they can successfully accomplish their research project (thesis). Students are required to take AI701, MTH701, NLP701 and NLP702 as mandatory courses. They can select two electives. To accommodate a diverse group of students, coming from different academic backgrounds, students have been provided with flexibility in course selection. The decision on the courses to be taken will be made in consultation with the students' supervisory panel, which will comprise of two or more faculty members. Essentially, the student's supervisory panel will help design a personalized coursework plan for each individual student, by looking at their prior academic track record and experience, and the planned research project. For full descriptions of courses, please refer to Appendix 1: Course descriptions.

The following core courses must be taken by all students:

Code	Course title	Credit hours
AI701	Foundations of Artificial Intelligence	4
MTH701	Mathematical Foundations of Artificial Intelligence	4
NLP701	Natural Language Processing	4
NLP702	Advanced Natural Language Processing	4

Elective courses

Students will select a minimum of two elective courses, with a total of 8 credit hours, based on interest, proposed research thesis, and career aspirations, in consultation with their supervisory panel. The elective courses available for the Master of Science in Natural Language Processing are listed in the table below.

For full descriptions of courses, please refer to Appendix 1: Course descriptions.

Code	Course title	Credit hours
AI702	Deep Learning	4
CV701	Human and Computer Vision	4
CV702	Geometry for Computer Vision	4
CV703	Visual Object Recognition and Detection	4
CV707	Digital Twins	4
DS701	Data Mining	4
DS702	Big Data Processing	4
HC701	Medical Imaging: Physics and Analysis	4
ML701	Machine Learning	4
ML703	Probabilistic and Statistical Inference	4
ML707	Smart City Services and Applications	4
ML708	Trustworthy Artificial Intelligence	4
ML709	IoT, Smart Systems, Services and Applications	4
NLP703	Speech Processing	4
ROB701	Introduction to Robotics	4

Research thesis

Master's thesis research exposes students to an unsolved research problem, where they are required to propose new solutions and contribute towards the body of knowledge. Students pursue an independent research study, under the guidance of a supervisory panel, for a period of one year.

For further details on the research thesis, please refer to Appendix 1: Course descriptions.

Code	Course title	Credit hours
NLP799	Master's Research Thesis	8
RES799	Introduction to Research Methods	2

Master of Science in **Robotics**

R

Mode Full-time | **Credits** 36 | **Location** On-campus

Program Aims

The aims of the Master's in Robotics are (1) to develop students' interest in, knowledge and understanding of robotics and autonomous systems and (2) to prepare them for PhD research in that area and/ or the industry workforce. The program teaches students to apply the research techniques and knowledge they have gained to solve complex problems in the field of Robotics. Robotics research and the development of intelligent systems continue to be one of the key priorities set by both government and industry. Interdisciplinary in scope, our Master's in Robotics provides an ideal foundation for what today's experts in robotics and intelligent systems need to know. Along with the chance to learn from world leaders in their fields from across the globe,our program offers hands-on activities where you will learn by designing, prototyping, and validating intelligent robotic systems. As a graduate of the Master's in Robotics program you will take a leading role in the development of integrated robotics technologies and systems, both locally and internationally.

National Qualifications Framework – five strands

The program learning outcomes (PLOs) are aligned with the Emirates Qualifications Framework and, as such, are divided into the following learning outcomes strands: Knowledge (K), Skills (S), Autonomy and responsibility (AR), Role in context (RC), and Self-development (SD).

Program learning outcomes

Upon completion of the program requirements, graduates will be able to:

1. Discuss and explain concepts and key components of robotics technologies (Knowledge and Skill).
2. Compare and contrast various robot sensors and their perception principles that enable a robot to analyse their environment, reason and take appropriate actions toward the given goal (Knowledge, Skill, Autonomy and Responsibility, Role in Context and Self-development).
3. Analyze and solve problems in spatial transformation robot locomotion, kinematics, motion control, localization and mapping, navigation, and path planning (Knowledge and Skill).
4. Critically appraise current research literature and situationally appropriate experiments with state-of-the-art robotic algorithms on a robotic platform (Knowledge and Self-development).
5. Effectively communicate the practical and entrepreneurial feasibility and sustainability of robotics concepts, innovations and design decisions using a range of media/visual mediums (Skill).
6. Function effectively in and lead a team that creates a collaborative and inclusive environment, establishes research goals, plans tasks, and meets desired objectives (Autonomy and Responsibility, Role in Context and Self-development).

The PLOs are mapped to a level nine (9) qualification according to the five strands of learning outcomes as per the National Qualifications Framework set by the UAE National Qualifications Authority (NQA) and the Ministry of Education (MoE):

Program Learning Outcomes	Knowledge	Skill	Aspects of competence		
			Autonomy and responsibility	Role in context	Self-development
PLO1	**K-1 L9**	S-1L9	-	-	-
PLO2	K-1, 3 L9	S-2, 3 L9	AR-1, 3 L9	**RC-1 L9**	SD-1 L9
PLO3	K-1 L9	S-1, 2, 3 L9	-	-	-
PLO4	K-2, 4 L9	-	-	-	SD-1 L9
PLO5	-	S-4 L9	-	-	-
PLO6	-	-	AR-1, 2 L9	**RC-1, 2 L9**	SD-1, 3 L9

Aligning PLOs for Master of Science in Robotics to QF Emirates Level 9 Framework.

Program study plan

Students are expected to complete coursework in the first year of degree and focus more on the research project and thesis writing in the second year. However, this is an indicative plan and students have the flexibility to take a light course load in the second year as well and, similarly, can start research in

the first year (e.g., literature review, background study, data collection or initial framework design) with the approval of their supervisory panel.

A typical study plan is as follows:

SEMESTER 1	
AI701	Foundations of Artificial Intelligence
ROB701	Introduction to Robotics
	+ one elective
SEMESTER 2	
ROB702	Robotics Vision and Intelligence
ROB703	Robot Localization and Navigation
	+ one elective
SUMMER	
INT799	Internship (up to six weeks)
SEMESTER 3	
RES799	Introduction to Research Methods
ROB799	Master's Research Thesis
SEMESTER 4	
ROB799	Master's Research Thesis

Program degree requirements

Completion requirements:

The minimum degree requirements for the Master of Science in Natural Language Processing is 36 credits, distributed as follows:

Core courses	Number of courses	Credit hours
Core	4	16
Electives	2	8
Internship	1	2
Introduction to Research	1	2
At least one internship of up to six weeks duration must be satisfactorily completed as a graduation requirement		
Research thesis	1	8

Program courses

Core courses

The Master of Science in Robotics is primarily a research-based degree. The purpose of coursework is to equip students with the right skillset, so that they can successfully accomplish their research project (thesis). Students are required to take AI701, ROB701, ROB702, ROB703, RES799 and INT799 as mandatory courses. They can select two electives. To accommodate a diverse group of students, coming from different academic backgrounds, students have been provided with flexibility in course selection.

The decision on the courses to be taken will be made in consultation

with students' supervisory panel, which will comprise two or more faculty members. Essentially, the student's supervisory panel will help design a personalized coursework plan for each individual student by looking at their prior academic track record and experience, and the planned research project. For full descriptions of courses, please refer to Appendix 1: Course descriptions.

The following core courses must be taken by all students:

Code	Course title	Credit hours
AI701	Foundations of Artificial Intelligence	4
ROB701	Introduction to Robotics	4
ROB702	Robotics Vision and Intelligence	4
ROB703	Robot Localization and Navigation	4
INT799	Internship	2
RES799	Introduction to Research Methods	2

Elective courses

Students will select a minimum of two elective courses, with a total of eight (or more) credit hours based on interest, proposed research thesis, and career aspirations, in consultation with their supervisory panel. The elective courses available for the Master of Science in Robotics are listed in the table below.

For full descriptions of courses, please refer to Appendix 1: Course descriptions..

Code	Course title	Credit hours
MTH701	Mathematical Foundations for Artificial Intelligence	4
DS701	Data Mining	4
DS702	Big Data Processing	4
HC701	Medical Imaging: Physics & Analysis	4
ML701	Machine Learning	4
ML703	Probabilistic and Statistical Inference	4
ML707	Smart City Services and Applications	4
ML709	IoT Smart Systems, Services and Applications	4
NLP701	Natural Language Processing	4
NLP702	Advanced Natural Language Processing	4
NLP703	Speech Processing	4

Research thesis

The Master's Thesis research exposes students to an unsolved research problem, where they are required to propose new solutions and contribute towards the body of knowledge. Students pursue an independent research study, under the guidance of a supervisory panel, for a period of one year. For further details on the research thesis, please refer to Appendix 1: Course descriptions.

Code	Course title	Credit hours
ROB799	Master's Research Thesis	8
RES799	Introduction to Research Methods	2

Doctor of Philosophy in **Computer Science**

CS

Mode Full-time | **Credits** 60 | **Location** On-campus

Program Aims

The goal of the Doctor of Philosophy (PhD) in Computer Science is to produce highly trained researchers for industry and academia. The program prepares students to apply the research techniques and knowledge they have gained to solve complex problems in the field of Computer Science and AI.

The PhD in Computer Science offers exciting opportunities to do innovative applied research and produce new intellectual contributions with world leaders in their field. It is designed to prepare students for leadership careers in academia, industry research labs and education in computer science. As a graduate of this program, students will not only have strong technical and research expertise in their field but will also have the ability to work effectively in interdisciplinary teams and be able to tackle problems that require both technical and non-technical solutions.

National Qualifications Framework – five strands

The program learning outcomes (PLOs) are aligned with the Emirates Qualifications Framework and, as such, are divided into the following learning outcomes strands: Knowledge (K), Skills (S), Autonomy and responsibility (AR), Role in context (RC), and Self-development (SD).

Program learning outcomes

Upon completion of the program requirements, graduates will be able to:

1. Analyze complex computing problems and apply principles of computing and other relevant disciplines to devise solutions (Knowledge, Skill, Autonomy and Responsibility, Role in Context, and Self-development).
2. Develop research projects in computer science that meet high standards of theoretical and methodological rigor (Knowledge, Skill, Autonomy and Responsibility, and Role in Context).
3. Recognize social and professional responsibilities and make informed decisions, which consider the impact, sustainability and entrepreneurial feasibility of computer science solutions and innovations in global and local, economic, environmental, and societal contexts (Knowledge, Skill, Autonomy and Responsibility, Role in Context, and Self-development).
4. Systematically review, analyze, and interpret the body of scientific literature and innovations in computer science (Knowledge, Skill, and Self-development).
5. Communicate new knowledge orally and through original research of publishable quality that satisfied peer review (Skill).

The PLOs are mapped to a level ten (10) qualification according to the five strands of learning outcomes as per the National Qualifications Framework set by the UAE National Qualifications Authority (NQA) and the Ministry of Education (MoE):

Program learning outcomes	Knowledge	Skill	Aspects of competence		
			Autonomy and responsibility	Role in context	Self-development
PLO1	**K-1, 2 L10**	S-1, 2 L10	AR-1 L10	RC-1 L10	SD-1, 3 L10
PLO2	K-1, 2 L10	S-2 L10	AR-1 L10	**RC-1, 2, 3 L10**	-
PLO3	K-2 L10	S-1 L10	**AR-2 L10**	**RC-3 L10**	SD-1, 3 L10
PLO4	K-2 L10	S-1 L10	-	-	SD-2 L10
PLO5	-	S-3 L10	-	-	-

Aligning PLOs for Doctor of Philosophy in Computer Science to QF Emirates Level 10 Framework.

Program study plan

Students are expected to complete course work in the first year of degree and focus on the research and thesis writing in the subsequent three years. Students must successfully pass a qualifying exam (QE) at the end of the first year to progress to the research component of the Ph.D. At the end of the second year, which is focused on research, students must present evidence of satisfactory research progress at a candidacy exam (CE) to progress to the final two years of research.

A typical study plan is as follows:

SEMESTER 1	
CS801	Advanced Complexity

CS802	Advanced Data Structures
	+ one elective
SEMESTER 2	
CS803	Randomized Algorithms
CS804	Combinatorial Optimization
	+ one elective
SUMMER	
INT899	Internship (up to four months)
SEMESTER 3	
RES899	Advanced Research Methods
CS899	Ph.D. Research Thesis
SEMESTER 4	
CS899	Ph.D. Research Thesis
SEMESTER 5	
CS899	Ph.D. Research Thesis
SEMESTER 6	
CS899	Ph.D. Research Thesis
SEMESTER 7	
CS899	Ph.D. Research Thesis
SEMESTER 8	
CS899	Ph.D. Research Thesis

Program degree requirements

Completion requirements:

The minimum degree requirements for the Doctor of Philosophy in Computer Science is 60 credits, distributed as follows:

Core courses	Number of courses	Credit hours
Core	4	16
Electives	2	8
Internship	1	2
At least one internship of up to four months duration must be satisfactorily completed as a graduation requirement		
Research Methods	1	2
Research thesis	1	32

Program courses

Core courses

The Doctor of Philosophy in Computer Science is primarily a research-based degree. The purpose of coursework is to equip students with the right skillset, so that they can successfully accomplish their research project (thesis). Students are required to take CS801, CS802, CS803, CS804, RES899 and INT899 as mandatory courses. They can select two electives. To accommodate a diverse group of students, coming from different academic backgrounds, students have been provided with flexibility in course selection.

The decision on the courses to be taken will be made in consultation

with students' supervisory panel, which will comprise two or more faculty members. Essentially, the student's supervisory panel will help design a personalized coursework plan for each individual student by looking at their prior academic track record and experience, and the planned research project. For full descriptions of courses, please refer to Appendix 1: Course descriptions.

Code	Course title	Credit hours
CS801	Advanced Complexity	4
CS802	Advanced Data Structures	4
CS803	Randomized Algorithms	4
CS804	Combinatorial Optimization	4
INT899	Internship	2
RES899	Advanced Research Methods	2

Elective Ccourses

Students will select a minimum of two elective courses, with a total of eight (or more) credit hours based on interest, proposed research thesis, and career aspirations, in consultation with their supervisory panel. The elective courses available for the Doctor of Philosophy in Computer Science are listed in the table below. For full descriptions of courses, please refer to Appendix 1: Course descriptions.

Code	Course title	Credit hours
NLP801	Deep Learning for Language Processing	4
NLP802	Current Topics in Natural Language Processing	4
NLP803	Advanced Speech Processing	4
NLP804	Deep Learning for Natural Language Generation	4
CV804	3D Geometry Processing	4

Research thesis

The Ph.D. research thesis exposes students to cutting-edge and unsolved research problems in the field of computer science, where they are required to propose new solutions and significantly contribute towards the body of knowledge. Students pursue an independent research study, under the guidance of a supervisory panel, for a period of three to four years. For further details on the research thesis, please refer to Appendix 1: Course descriptions.

Code	Course name	Credit hours
CS899	Ph.D. Research Thesis	32
RES899	Advanced Research Methods	2

Doctor of Philosophy in **Computer Vision**

CV

Mode Full-time | **Credits** 60 | **Location** On-campus

Program Aims

The goal of the Doctor of Philosophy (PhD) in Computer Vision is to produce highly trained researchers for industry and academia. The program prepares students to apply the research techniques and knowledge they have gained to solve complex problems in the field of Computer Vision and AI.

This scientific field studies how computers can be used to automatically understand and interpret visual imagery. It aims to mimic the astounding capabilities of human visual cortex using machine vision algorithms. It studies how an image is created, the geometry of the 3D world and high-level tasks such as object recognition, object detection, and tracking, image segmentation and action recognition. Computer vision has important applications in augmented/virtual reality, autonomous cars, service robots, biometrics and forensics, remote sensing and security and surveillance.

National Qualifications Framework – five strands

The program learning outcomes (PLOs) are aligned with Emirates Qualifications Framework and as such are divided into the following learning outcomes strands: Knowledge (K), Skills (S), Autonomy and responsibility (AR), Self-development (SD), and Role in context (RC).

Program learning outcomes

Upon completion of the program requirements, graduates will be able to:

1. Develop expertise in several specialized areas of research in computer vision (Knowledge).
2. Compare and contrast existing literature, apply reasoning, and master necessary skills and techniques to develop novel ideas that are recognized by the experts of the computer vision discipline (Knowledge, Skill, Autonomy & Responsibility and Self-development).
3. Apply advanced problem-solving skills to analyze, design and execute innovative solutions for the existing and/or new problems faced in both industry and academia (Knowledge, Skill, Autonomy & Responsbility, Role in Context and Self-development).
4. Initiate, manage and complete technically challenging computer vision projects and clearly communicate concepts, highly complex ideas, and key findings in the form of technical reports, scientific publications, and oral presentations at relevant technical venues (Knowledge, Skill, and Autonomy and responsibility).
5. Select and use programming tools, libraries, and other relevant resources to solve real-world computer vision problems (Knowledge and Skill).
6. Develop advanced ability to work independently with substantial authority or in team collaboration with professional integrity to complete highly challenging computer vision projects in a timely manner (Skill, Autonomy and responsibility, and Role in context).
7. Develop new knowledge in computer vision that makes students suitable for a role in academia or industry (Skill,Knowledge).
8. Practice research ethics and commit to professional responsibilities while conducting cutting-edge innovative, sustainable and entrepreneurial advancement in computer vision discipline. (Autonomy and Responsibility and Self-development).
9. Articulate legal, ethical, environmental, and socio-cultural ramifications of computer vision technologies, and take a lead in making informed and fair decisions on complex issues (Skill Autonomy and responsibility, and Self-development).

The PLOs are mapped to a level 10 qualification according to the five strands of learning outcomes as per the National Qualifications Framework set by the UAE National Qualifications Authority (NQA) and the Ministry of Education (MoE):

Program learning outcomes	Knowledge	Skill	Aspects of competence		
			Autonomy and responsibility	Role in context	Self-development
PLO1	**K-1L10**	-	-	-	-
PLO2	K-1L10	S-1,2L10	AR-1L10	-	SD-1L10
PLO3	K-1L10	S-1,2L10	**AR-1L10**	**RC-1L10**	SD-1L10
PLO4	K-2L10	S-1,3L10	-	RC-1L10	-
PLO5	K-1L10	S-1,2L10	-	-	-
PLO6	-	S-1,2L10	AR-1L10	**RC-1,2,3L10**	-
PLO7	K-2L10	S-2L10	-	-	-
PLO8	-	-	AR-1L10	-	SD-2,3L10
PLO9	-	S-3L10	AR-2L10	-	SD-3L10

Aligning PLOs for Doctor of Philosophy in Computer Vision to QF Emirates Level 10 Framework.

Program study plan

The students are expected to complete course work in the first year of their degree and focus on the research and thesis writing in the subsequent three years. Students must successfully pass a qualifying exam (QE) at the end of the first year to progress to the research component of the Ph.D. At the end of the second year, which is focused on research, students must present evidence of satisfactory research progress at a candidacy exam (CE) to progress to the final two years of research.

A typical study plan is as follows:

SEMESTER 1	
CV801	Advanced Computer Vision
CV802	Advanced 3D Computer Vision
	+ 1 elective
SEMESTER 2	
CV803	Advanced techniques in visual object recognition and detection
CV804	3D Geometry Processing
	+ 1 elective
SUMMER	
INT899	Internship
SEMESTER 3	
RES899	Advanced Research Methods
CV899	Computer Vision Ph.D. Research Thesis
SEMESTER 4	
CV899	Computer Vision Ph.D. Research Thesis
SEMESTER 5	
CV899	Computer Vision Ph.D. Research Thesis
SEMESTER 6	
CV899	Computer Vision Ph.D. Research Thesis
SEMESTER 7	
CV899	Computer Vision Ph.D. Research Thesis
SEMESTER 8	
CV899	Computer Vision Ph.D. Research Thesis

Program degree requirements

Completion requirements:

The minimum degree requirements for the Doctor of Philosophy in Computer Vision is 60 credits, distributed as follows:

Core courses	Number of courses	Credit hours
Core	4	16
Electives	2	8
Internship	1	2
Advanced Research Methods	1	2
Research thesis	1	32

Program courses

Core courses

The Doctor of Philosophy in Computer Vision is primarily a research-based degree. The purpose of coursework is to equip students with the right skillset, so they can successfully accomplish their research project (thesis). Students are required to take CV801, CV802, CV803 and CV804 as mandatory courses.

To accommodate a diverse group of students, coming from different academic backgrounds, students have been provided with flexibility in course selection. The decision on the courses to be taken will be made in consultation with the students' supervisory panel, which will comprise of two or more faculty members. Essentially, the student's supervisory panel will help design a personalized coursework plan for each individual student, by looking at their prior academic track record and experience, and the planned research project.

For full descriptions of courses, please refer to Appendix 1: Course descriptions.

The following core courses must be taken by all students:

Code	Course title	Credit hours
CV801	Advanced Computer Vision	4
CV802	Advanced 3D Computer Vision	4
CV803	Advanced techniques in visual object recognition and detection	4
CV804	3D Geometry Processing	4

Elective courses

Students will select a minimum of two elective courses, with a total of eight (or more) credit hours, based on interest, proposed research thesis, and career aspirations, in consultation with their supervisory panel. The elective courses available for the Doctor of Philosophy in Computer Vision are listed in the tables below.

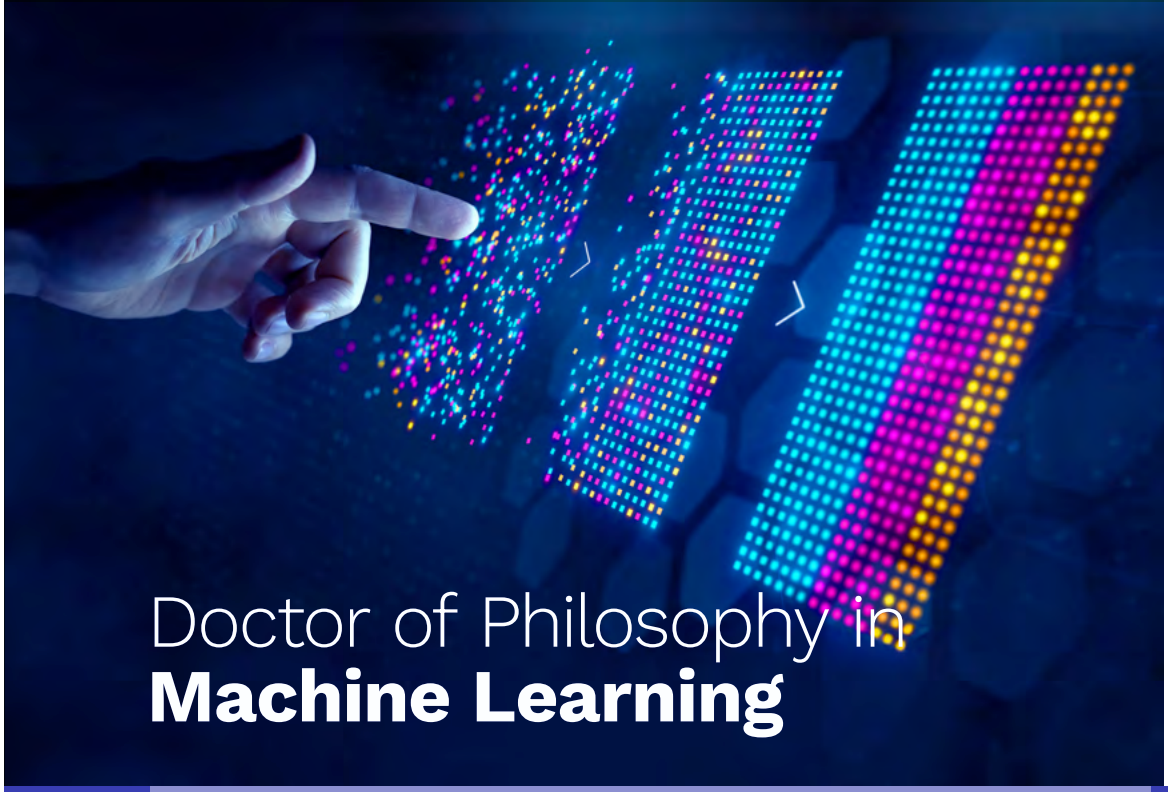
For full descriptions of courses, please refer to Appendix 1: Course descriptions.

Code	Course title	Credit hours
ML801	Foundations and Advanced Topics in Machine Learning	4
ML802	Advanced Machine Learning	4
ML803	Advanced Probabilistic and Statistical Inference	4
ML804	Advanced Topics in Continuous Optimization	4
ML806	Advanced Topics in Reinforcement Learning	4
ML807	Federated Learning	4
ML808	Advanced Topics in Causality and Machine Learning	4
ML812	Advanced Topics in Algorithms for Big Data	4
NLP801	Deep Learning for Language Processing	4
NLP802	Current Topics in Natural Language Processing	4
NLP803	Advanced Speech Processing	4
NLP804	Deep Learning for Natural Language Generation	4
CV805	Life-long Learning Agents for Vision	4

Research thesis

The Ph.D. research thesis exposes students to cutting-edge and unsolved research problems in the field of computer vision, where they are required to propose new solutions and significantly contribute towards the body of knowledge. Students pursue an independent research study, under the guidance of a supervisory panel, for a period of three to four years. For further details on the research thesis, please refer to Appendix 1: Course descriptions.

Code	Course title	Credit hours
CV899	Computer Vision Ph.D. Research Thesis	32
RES899	Advanced Research Methods	2



Doctor of Philosophy in **Machine Learning**

ML

Mode
Full-time

Credits
60

Location
On-campus

Program Aims

The goal of the Doctor of Philosophy (PhD) in Machine Learning is to produce highly trained researchers for industry and academia. The program prepares students to apply the research techniques and knowledge they have gained to solve complex problems in the field of Machine Learning and AI.

The scientific study of algorithms and statistical models that computer systems use to effectively perform a specific task without using explicit instructions, relying on patterns and inference instead. These algorithms are based on mathematical models learned automatically from data, thus allowing machines to intelligently interpret and analyse input data to derive useful knowledge and arrive at important conclusions. Machine learning is heavily used for enterprise applications (e.g., business intelligence and analytics), effective web search, robotics, smart cities and understanding of the human genome.

National Qualifications Framework – five strands

The program learning outcomes (PLOs) are aligned with Emirates Qualifications Framework and as such are divided in the following learning outcomes strands: Knowledge (K), Skills (S), Autonomy and responsibility (AR), Self-development (SD), and Role in context (RC).

Program learning outcomes

Upon completion of the program requirements, graduates will be able to:

1 Express comprehensive and deep understanding of the pipelines at the

frontier of machine learning: data, models, algorithmic principles, and empirics (Knowledge).

2. Apply a range of skills and techniques in data-preprocessing, exploration, and visualization of data-statistics as well as complex algorithmic outcomes (Knowledge and Skill).
3. Identify the capabilities and limitations of the different forms of learning algorithms and critically analyze, evaluate, and improve the performance of the learning algorithms (Knowledge, Skill, Autonomy & Responsibility and Self-development.).
4. Develop problem-solving skills through independently applying the principles and methods learned in the program to various complex real-world problem (Skill, Role in Context and Self-development)..
5. Compare and contrast statistical properties and performance guarantees including convergence rates (in theory and practice) for different learning algorithms (Knowledg, Skill and Self-development).
6. Employ and deploy ML-relevant programming tools for a variety of ML problems (Autonomy & Responsbiltiy).
7. Identify the limitations of existing machine learning algorithms and conceptualize, design, and implement an innovative, sustainable, and entrepreneurial solution for a variety of highly complex problems (Knowledge, Skill and Role in context).
8. Initiate, manage, and complete research manuscripts that demonstrate expert self-evaluation and advanced skills in communicating highly complex ideas related to machine learning (Knowledge, Skill, and Role in Context)
9. Initiate, manage, and complete multiple complex project reports, and critiques (Skill, Autonomy & Responsibility, Role in context and Self Development)).

The PLOs are mapped to a level 10 qualification according to the FIVE strands of learning outcomes as per the National Qualifications Framework set by the UAE National Qualifications Authority (NQA) and the Ministry of Education (MoE):

Program Learning Outcomes	Knowledge	Skill	Aspects of competence		
			Autonomy and responsibility	Role in context	Self-development
PLO1	**K-1L10**	-	-	-	-
PLO2	K-1L10	S-2L10	-	**-**	-
PLO3	K-1L10	S-2L10	**AR-1L10**		SD-1L10
PLO4	-	S-2L10	-	RC-2L10	SD-3L10
PLO5	K-1L10	S-1L10	**-**	**-**	**SD-1L10**
PLO6	-		AR-1L10	**-**	-
PLO7	K-2L10	S-1L10		**RC-3L10**	SD-1,3L10
PLO8	K-2L10	S-3L10	-	RC-1,2L10	-
PLO9	-	S-1L10	**AR-2L10**	**RC-1,2L10**	SD-2,3L10

Aligning PLOs for Doctor of Philosophy in Machine Learning to QF Emirates Level 10 Framework.

Program study plan

The students are expected to complete coursework in the first year of their degree and focus more on the research project and thesis writing in the second year. However, this is an indicative plan and students have the flexibility to take a light course load in the second year as well and similarly can start research in the first year (e.g., literature review, background study, data collection or initial framework design) with the approval of their supervisory panel.

A typical study plan is as follows:

SEMESTER 1	
ML801	Foundations & Advanced Topics in Machine Learning
ML802	Advanced Machine Learning
	+ I elective
SEMESTER 2	
ML803	Advanced Probabilistic and Statistical Inference
ML804	Advanced Topics in Continuous Optimization
	+ 1 elective
SUMMER	
INT899	Internship (up to four months)
SEMESTER 3	
RES899	Advanced Research Methods
ML899	Machine Learning Ph.D. Research Thesis
SEMESTER 4	
ML899	Machine Learning Ph.D. Research Thesis
SEMESTER 5	
ML899	Machine Learning Ph.D. Research Thesis
SEMESTER 6	
ML899	Machine Learning Ph.D. Research Thesis
SEMESTER 7	
ML899	Machine Learning Ph.D. Research Thesis
SEMESTER 8	
ML899	Machine Learning Ph.D. Research Thesis

Program degree requirements

Completion requirements:

The minimum degree requirements for the Doctor of Philosophy in Machine Learning is 60 credits, distributed as follows:

Core courses	Number of courses	Credit hours
Core	4	16
Electives	2	8
Internship	1	2
Advanced research method	I	2
Research thesis	1	32

Program courses

Core courses

The Doctor of Philosophy in Machine Learning is primarily a research-based degree. The purpose of coursework is to equip students with the right skillset, so they can successfully accomplish their research project (thesis). Students

are required to take ML801, ML802, ML803 and ML804 as mandatory courses. To accommodate a diverse group of students, coming from different academic backgrounds, students have been provided with flexibility in course selection. The decision on the courses to be taken will be made in consultation with the students' supervisory panel, which will comprise of two or more faculty members. Essentially, the student's supervisory panel will help design a personalized coursework plan for each individual student, by looking at their prior academic track record and experience, and the planned research project.

For full descriptions of courses, please refer to Appendix 1: Course descriptions.

The following core courses must be taken by all students:

Code	Course title	Credit hours
ML801	Foundations & Advanced Topics in Machine Learning	4
ML802	Advanced Machine Learning	4
ML803	Advanced Probabilistic and Statistical Inference	4
ML804	Advanced Topics in Continuous Optimization	4

Elective courses

Students will select a minimum of two elective courses, with a total of eight (or more) credit hours, based on interest, proposed research thesis, and career aspirations, in consultation with their supervisory panel.

The elective courses available for the Doctor of Philosophy in Machine Learning are listed in the tables below. For full descriptions of courses, please refer to Appendix 1: Course descriptions.

Code	Course title	Credit hours
ML806	Advanced Topics in Reinforcement Learning	4
ML807	Federated Learning	4
ML808	Advanced Topics in Causality and Machine Learning	4
ML812	Advanced Topics in Algorithms for Big Data	4
CV801	Topics in Advanced Machine Learning	4
CV802	Advanced 3D Computer Vision	4
CV803	Advanced techniques in visual object recognition and detection	4
CV804	3D Geometry Processing	4
CV805	Life-long Learning Agents for Vision	4
NLP801	Deep Learning for Language Processing	4
NLP802	Current Topics in Natural Language Processing	4
NLP803	Advanced Speech Processing	4
NLP804	Deep Learning for Natural Language Generation	4

Research thesis

The Ph.D. research thesis exposes students to cutting-edge and unsolved research problems in the field of machine learning, where they are required to propose new solutions and significantly contribute towards the body of knowledge. Students pursue an independent research study, under the guidance of a supervisory panel, for a period of three to four years. For further details on the research thesis, please refer to Appendix 1: Course descriptions.

Code	Course title	Credit hours
ML899	Machine Learning Ph.D. Research Thesis	32
RES899	Advanced Research Methods	2

Doctor of Philosophy in **Natural Language Processing**

NLP

Mode Full-time | **Credits** 60 | **Location** On-campus

Program Aims

The goal of the Doctor of Philosophy (PhD) in Natural Language Processing is to produce highly trained researchers for industry and academia. The program prepares students to apply the research techniques and knowledge they have gained to solve complex problems in the field of Natural Language Processing and AI.

NLP focuses on system development that allows computers to communicate with people using everyday language. Natural language generation systems convert information from the computer database into readable or audible human language and vice versa. Such systems also enable sophisticated tasks such as inter-language translation, semantic understanding, text summarization and holding a dialog. The key applications of NLP algorithms include interactive voice response applications, automated translators, digital personal assistants (e.g., Siri, Cortana, Alexa), chatbots, and smart word processors.

National Qualifications Framework – five strands

The Program Learning Outcomes (PLOs) are aligned with Emirates Qualifications Framework and as such are divided in the following learning outcomes strands: Knowledge (K), Skills (S), Autonomy and responsibility (AR), Self-development (SD), and Role in context (RC).

Program learning outcomes

Upon completion of the program requirements, graduates will be able to:

1. Devise cutting-edge NLP algorithms with applications to real-life. (Skill, and Autonomy & Responsiblity)
2. Implement, evaluate, and benchmark existing state-of-the-art NLP scholarly publications. (Knowledge, Skills, Role in Context & Self-development)
3. Identify open research problems, and the gaps in the existing body of knowledge, to formulate high impact research questions. (Knowledge, Skills and Self-development)
4. Independently develop innovative solutions, through extensive research and scholarship, to resolve unsolved research problems in high-impact real-life applications of NLP. (Knowledge, Skills, Autonomy and responsibility and Self Development)
5. Invent innovative, sustainable, and entrepreneurial state of the art solutions to existing open research problems. (Knowledge, Skills and Autonomy & Responsibility)
6. Pursue an NLP project either independently, or as part of a team in a collegial manner, with minimal supervision. (Autonomy and responsibility and Role in Context
7. Initiate, manage, and complete research manuscripts that demonstrate expert self-evaluation and advanced skills in scientifically communicating highly complex ideas. (Role in context and Self- development)
8. Initiate, manage and complete multiple project reports and critiques, on a variety of NLP problems Knowledge, Skill, Role in context, and Self-development)

The PLOs are mapped to a level 10 qualification according to the 5 strands of learning outcomes as per the National Qualifications Framework set by the UAE National Qualifications Authority (NQA) and the Ministry of Education (MoE):

Program Learning Outcomes	Knowledge	Skill	Aspects of competence		
			Autonomy and responsibility	Role in context	Self-development
PLO1	-	S-1L10	AR-1L10	-	-
PLO2	K-1L10	S-1,3L10	-	**RC-1L10**	SD-1L10
PLO3	K-1L10	S-1,2L10	-	-	SD-1L10
PLO4	K-2L10	S-1,2L10	AR-1L10	-	SD-1L10
PLO5	K-2L10	S-1L10	**AR-1,2L10**	-	-
PLO6	-	-	AR-1L10	**RC-2,3L10**	-
PLO7	K-2L10	S-3L10	-	**RC-1L10**	SD-2,3L10
PLO8	-	-	AR-1,2L10	-	SD-1,2L10

Aligning PLOs for Doctor of Philosophy in Natural Language Processing to QF Emirates Level 10 Framework.

Program study plan

The students are expected to complete course work in the first year of their

degree and focus on the research and thesis writing in the subsequent three years. Students must successfully pass a qualifying exam (QE) at the end of the first year to progress to the research component of the Ph.D. At the end of the second year, which is focused on research, students must present evidence of satisfactory research progress at a candidacy exam (CE) to progress to the final two years of research.
A typical study plan is as follows:

SEMESTER 1	
NLP801	Deep Learning for Language Processing
NLP802	Current Topics in Natural Language Processing
	+ I elective
SEMESTER 2	
NLP803	Advanced Speech Processing
NLP804	Deep Learning for Natural Language Generation
	+ I elective
SUMMER	
INT899	Internship (up to four months)
SEMESTER 3	
RES899	Advanced Research Methods
NLP899	Natural Language Processing Ph.D. Research Thesis
SEMESTER 4	
NLP899	Natural Language Processing Ph.D. Research Thesis
SEMESTER 5	
NLP899	Natural Language Processing Ph.D. Research Thesis
SEMESTER 6	
NLP899	Natural Language Processing Ph.D. Research Thesis
SEMESTER 7	
NLP899	Natural Language Processing Ph.D. Research Thesis
SEMESTER 8	
NLP899	Natural Language Processing Ph.D. Research Thesis

Program degree requirements

Completion requirements:

The minimum degree requirements for the Doctor of Philosophy in Natural Language Processing is 60 credits, distributed as follows:

Core courses	Number of courses	Credit hours
Core	4	16
Electives	2	8
Internship	1	2
Advanced Res M	1	2
Research thesis	1	32

Program courses

Core courses

The Doctor of Philosophy in Natural Language Processing is primarily a research-based degree. The purpose of coursework is to equip students with the right skillset, so they can successfully accomplish their research project (thesis). Students are required to take NLP801, NLP802, NLP803 and NLP804 as mandatory courses. They can select two electives. To accommodate a

diverse group of students, coming from different academic backgrounds, students have been provided with flexibility in course selection. The decision on the courses to be taken will be made in consultation with the students' supervisory panel, which will comprise of two or more faculty members. Essentially, the student's supervisory panel will help design a personalized coursework plan for each individual student, by looking at their prior academic track record and experience, and the planned research project.

For full descriptions of courses, please refer to Appendix 1: Course descriptions.

The following core courses must be taken by all students::

Code	Course title	Credit hours
NLP801	Deep Learning for Language Processing	4
NLP802	Current Topics in Natural Language Processing	4
NLP803	Advanced Speech Processing	4
NLP804	Deep Learning for Natural Language Generation	4

Elective courses

Students will select a minimum of two elective courses, with a total of 8 (or more) credit hours, based on interest, proposed research thesis, and career aspirations, in consultation with their supervisory panel. The elective courses available for the Doctor of Philosophy in Natural Language Processing are listed in the tables below.

For full descriptions of courses, please refer to Appendix 1: Course descriptions.

Code	Course title	Credit hours
ML801	Foundations and Advanced Topics in Machine Learning	4
ML802	Advanced Machine Learning	4
ML803	Advanced Probabilistic and Statistical Inference	4
ML804	Advanced Topics in Continuous Optimization	4
ML806	Advanced Topics in Reinforcement Learning	4
ML807	Federated Learning	4
ML808	Advanced Topics on Causality and Machine Learning	4
ML812	Advanced Topics in Algorithms for Big Data	4
CV801	Advanced Computer Vision	4
CV802	Advanced 3D Computer Vision	4
CV803	Advanced techniques in visual object recognition and detection	4
CV804	3D Geometry Processing	4
CV805	Life-long Learning Agents for Vision	4

Research thesis

Master's thesis research exposes students to an unsolved research problem, where they are required to propose new solutions and contribute towards the body of knowledge. Students pursue an independent research study, under the guidance of a supervisory panel, for a period of one year.

For further details on the research thesis, please refer to Appendix 1: Course descriptions.

Code	Course title	Credit hours
NLP899	Natural Language Processing Ph.D. Research Thesis	32
RES899	Advanced Research Methods	2

Doctor of Philosophy in **Robotics**

R

Mode Full-time

Credits 60

Location On-campus

Program Aims

The goal of the Ph.D. program in Robotics is to prepare the next generation of world-class researchers, industry leaders, academics, and educators in the field of robotics and autonomous systems.

The Ph.D. in Robotics focuses on human-centered and autonomous robotics research and prepares exceptional students for careers at the cutting edge of academia, industry, and government. Our world-leading robotics researchers, students and industry partners collaborate to advance discoveries in various aspects of robotics, such as perception and applied machine learning, human-robot interaction, cognitive and soft robotics, and swarm intelligence. Ph.D. students in Robotics enjoy the unique experience of conducting world-class research with the state-of-the-art equipment and under the guidance of internationally renowned experts

National Qualifications Framework – five strands The Program learning outcomes (PLOs) are aligned with the Emirates Qualifications Framework and as such are divided into the following learning outcomes strands: Knowledge (K), Skills (S), Autonomy and responsibility (AR), Role in context (RC), and Self-development (SD).

Program learning outcomes

Upon completion of the program requirements, graduates will be able to:

1. Analyze a problem and apply an appropriate selection of advanced methods in robotics and autonomous systems. (Knowledge, Skill, Autonomy and Responsibility, Role in Context, and Self-development)
2. Design and integrate advanced software and hardware to realize autonomous robotic solutions, in teams and individually. (Skill, Autonomy and Responsibility, and Role in Context)
3. Critically evaluate the potential for multi-robot systems, robotics, and autonomous systems across a range of applications. (Knowledge, Skill, Autonomy and Responsibility, and Self-development).
4. Review and critically appraise current research topics, problems, and challenges within robotics and autonomous systems. (Knowledge, Skill, Role in Context, and Self-development).
5. Discover, interpret, and communicate new knowledge orally and through novel research of top-tier publishable quality. (Knowledge, Skill, Autonomy and Responsibility, and Self-development)

The PLOs are mapped to a level ten (10) qualification according to the five strands of learning outcomes as per the National Qualifications Framework set by the UAE National Qualifications Authority (NQA) and the Ministry of Education (MoE):

Program Learning Outcomes	Knowledge	Skill	Aspects of competence		
			Autonomy and responsibility	Role in context	Self-development
PLO1	**K-1 L10**	S-1 L10	AR-1 L10	RC-2 L10	SD-1, 2, 3 L10
PLO2	-	S-2 L10	AR-1 L10	**RC-2, 3 L10**	-
PLO3	K-1 L10	S-1, 2, 3 L10	**AR-2 L10**	-	SD-1, 2 L10
PLO4	K-1, 2 L10	S-1, 3 L10	-	RC-1 L10	SD-1 L10
PLO5	K-2 L10	S-2, 3 L10	**AR-1 L10**	-	**SD-1, 3 L10**

Aligning PLOs for Doctor of Philosophy in Robotics to QF Emirates Level 10 Framework.

Program study plan

Students are expected to complete course work in the first year of degree and focus on the research and thesis writing in the subsequent three years. Students must successfully pass a qualifying exam (QE) at the end of the first year to progress to the research component of the Ph.D. At the end of the second year, which is focused on research, students must present evidence of satisfactory research progress at a candidacy exam (CE) to progress to the final two years of research.

A typical study plan is as follows:

SEMESTER 1	
ROB801	Advanced Robotics Motion Planning

ROB802	Advanced Topics in Robotics: Multi-Robot Systems
	+ 1 Elective
SEMESTER 2	
ROB803	Advanced Humanoid Robotics
ROB804	Vision for Autonomous Robotics
	+ 1 Elective
SUMMER	
INT899	Internship (up to four months)
SEMESTER 3	
RES899	Advanced Research Methods
ROB899	Ph.D. Robotics Research Thesis
SEMESTER 4	
ROB899	Ph.D. Robotics Research Thesis
SEMESTER 5	
ROB899	Ph.D. Robotics Research Thesis
SEMESTER 6	
ROB899	Ph.D. Robotics Research Thesis
SEMESTER 7	
ROB899	Ph.D. Robotics Research Thesis
SEMESTER 8	
ROB899	Ph.D. Robotics Research Thesis

Program degree requirements

Completion requirements:

The minimum degree requirements for the Doctor of Philosophy in Robotics is 60 credits, distributed as follows:

Core courses	Number of courses	Credit hours
Core	4	16
Electives	2	8
Internship	1	2
At least one internship of up to four months' duration must be satisfactorily completed as a graduation requirement		
Research Methods	1	2
Research thesis	1	32

Program courses

Core courses

The Doctor of Science in Robotics is primarily a research-based degree. The purpose of coursework is to equip students with the right skillset, so they can successfully accomplish their research project (thesis). Students are required to take ROB801, ROB802, ROB803, ROB804, RES899 and INT899 as mandatory courses. They can select two electives. To accommodate a diverse group of students, coming from different academic backgrounds, students

have been provided with flexibility in course selection. The decision on the courses to be taken will be made in consultation with students' supervisory panel, which will comprise of two or more faculty members. Essentially, the student's supervisory panel will help design a personalized coursework plan for each individual student, by looking at their prior academic track record and experience, and the planned research project. For full descriptions of courses, please refer to Appendix 1: Course descriptions.

The following core courses must be taken by all students:

Code	Course title	Credit hours
ROB801	Advanced Robotics Motion Planning	4
ROB802	Advanced Topics in Robotics: Multi-Robot Systems	4
ROB803	Advanced Humanoid Robotics	4
ROB804	Vision for Autonomous Robotics	4
INT899	Internship	2
RES899	Advanced Research Methods	2

Elective courses

Students will select a minimum of two elective courses, with a total of eight (or more) credit hours based on interest, proposed research thesis, and career aspirations, in consultation with their supervisory panel. The elective courses available for the Doctor of Philosophy in Robotics are listed in the table below.

For full descriptions of courses, please refer to Appendix 1: Course descriptions.

Code	Course title	Credit hours
ML806	Advanced Topics in Reinforcement Learning	4
ML807	Federated Learning	4
ML808	Advanced Topics on Causality and Machine Learning	4
CV804	3D Geometry Processing	4
NLP801	Deep Learning for Language Processing	4
NLP802	Current Topics in Natural Language Processing	4
NLP803	Advanced Speech Processing	4
NLP804	Deep Learning for Natural Language Generation	4

Research thesis

The Ph.D. research thesis exposes students to cutting-edge and unsolved research problems in the field of robotics, where they are required to propose new solutions and significantly contribute towards the body of knowledge. Students pursue an independent research study, under the guidance of a supervisory panel, for a period of three to four years. For further details on the research thesis, please refer to Appendix 1: Course descriptions.

Code	Course title	Credit hours
ROB899	Ph.D. Research Thesis	32
RES899	Advanced Research Methods	2

Appendix 1:
Short Course descriptions

Teaching plan of courses throughout a semester:

Two lectures per week, each lecture of 1.5 hours, one lab per week of two hours.

Course Descriptions

AI701 Foundations of Artificial Intelligence (4CR)

Prerequisites:	Basic concepts in calculus, linear algebra and programming
Core course for:	M.Sc. in Machine Learning , M.Sc. in Natural Language Processing M.Sc. in Robotics
Elective course for:	None

This course provides a comprehensive introduction to artificial intelligence. It builds upon fundamental concepts in machine learning. Students will learn about supervised and unsupervised learning, various learning algorithms, and the basics of the neural network, deep learning, and reinforcement learning.

AI702 Deep Learning (4CR)

Prerequisites:	Basics of linear algebra, calculus, probability and statistics Proficiency in Python
Core course for:	None
Elective course for:	M.Sc. in Machine Learning; M.Sc. in Computer Vision; M.Sc. in Natural Language Processing

This course provides a comprehensive introduction to artificial intelligence. It builds upon fundamental concepts in machine learning. Students will learn about supervised and unsupervised learning, various learning algorithms, and the basics of the neural network, deep learning, and reinforcement learning.

CS701 Advanced Algorithms (4CR)

Prerequisites:	None
Core course for:	M.Sc. in Computer Science
Elective course for:	None

We study techniques for the design of algorithms (such as dynamic programming) and algorithms for fundamental problems – such as fast Fourier transform (FFT). In addition, we explore computational intractability, specifically, the theory of NP-completeness. The key topics covered in the course are: dynamic programming; divide and conquer, including FFT; randomized algorithms, including RSA cryptosystem; graph algorithms; max-flow algorithms; linear programming; and NP-completeness.

CS702 Theory of Computer Science (4CR)

Prerequisites:	None
Core course for:	M.Sc. in Computer Science
Elective course for:	None

This course uncovers the science behind computing by studying computation abstractly without involving any specifics of programming languages and/or computing platforms. Specifically, it studies finite automata that capture what can be computed using constant memory, the universal computational model of Turing machines, the inherent limits of what can be solved on a computer (undecidability), the notion of computational tractability, and the P vs NP question. Finally, the course also involves Boolean circuits, cryptography, polynomial hierarchy, rigorous thinking and mathematical proofs.

Course descriptions

CS703 Operating Systems (4CR)

Prerequisites:	MTH703 and CS701
Core course for:	M.Sc. in Computer Science
Elective course for:	None

This course discusses the advanced concepts in operating system design and implementation. The operating system provides a convenient and efficient interface between user programs and the hardware of the computer on which they run.

CS704 Programming Languages and Implementation (4CR)

Prerequisites:	None
Core course for:	None
Elective course for:	M.Sc. in Computer Science

This course aims at uncovering the fundamental principles of programming language design, semantics, and implementation.

CS705 Distributed and Parallel Systems (4CR)

Prerequisites:	None
Core course for:	None
Elective course for:	M.Sc. in Computer Science

Parallel and distributed systems are ubiquitous in many applications in our daily life including AI, online games, social networks, web services and healthcare simulations. These systems distribute computation over many computing units because they must sustain massive workloads that cannot fit into a single computer. Designing efficient, easy-to-maintain and correct parallel and distributed systems is challenging. In this course, we specifically study distributed computing, consistency, remote procedure calls, logging, recovery, and MapReduce. Further, we will cover instruction-level parallelism, parallel programming, cache coherence, memory consistency, and synchronization implementation.

CS799 Computer Science Master's Research Thesis (8CR)

Prerequisites:	None
Core course for:	M.Sc. in Computer Science
Elective course for:	None

Master's thesis research exposes students to an unsolved research problem, where they are required to propose new solutions and contribute toward the body of knowledge. Students pursue an independent research study, under the guidance of a supervisory panel, for a period of one year. Master's thesis research helps train graduates to pursue more advanced research in their Ph.D. degree. Further, it enables graduates to pursue an industrial project involving a research component independently.

CS801 Advanced Complexity (4CR)

Prerequisites:	CS701 or equivalent, CS702 or equivalent
Core course for:	Ph.D. in Computer Science
Elective course for:	None

The course covers the following topics:
- The theory of NP-completeness and its relationship to the complexity classes P and NP.
- Circuit complexity and alternations.
- SAT, the complexity of counting, and algebraic circuit complexity.
- Circuit complexity lowerbound, hardness vs randomness, ironic complexity, and interactive proof systems.

Course descriptions

CS802 Advanced Data Structures (4CR)

Prerequisites:	CS701 or equivalent, MTH703 or equivalent
Core course for:	Ph.D. in Computer Science
Elective course for:	None

This course covers a broad overview of the many diverse types of data structures, including persistent, retroactive, geometric data structures, like a map, and temporal data structures, as in storage that happens over a time series. A comprehensive study of these data structures is a vital component of this subject. It also covers dictionaries, static trees, strings, succinct structures, and dynamic graphs. Finally, the course will cover the major directions of research for a wide variety of such data structures.

CS803 Randomized Algorithms (4CR)

Prerequisites:	MTH703 or equivalent, CS701 or equivalent
Core course for:	Ph.D. in Computer Science
Elective course for:	None

Randomized algorithms went from being a tool in computational number theory to finding wide-spread application in many types of algorithms. Two benefits of randomization have spearheaded this growth: simplicity and speed. This course discusses the basic and advanced concepts of ran-domized algorithms. Specifically, it includes random sampling, tail inequalities, probabilistic meth-ods, algebraic methods, and random walks. Further, it also covers linear programming, graph algo-rithms and approximate counting topics.

CS804 Combinatorial Optimization (4CR)

Prerequisites:	MTH703 or equivalent , CS701 or equivalent
Core course for:	Ph.D. in Computer Science
Elective course for:	None

This course covers the topic of polyhedra, including various mathematical concepts and algorithms such as Farkas lemma, duality, complementary slackness, and decomposition of polyhedra. The course also covers topics like integer polyhedra, matrices, matching (bipartite and non-bipartite), graphs, matroids, polymatroids and submodular functions. The course will also cover the application of these concepts in machine learning.

CS899 Computer Science Ph.D. Research Thesis (32CR)

Prerequisites:	Coursework + pass in qualifying exam
Core course for:	Ph.D. in Computer Science
Elective course for:	None

Ph.D. thesis research exposes students to cutting-edge and unsolved research problems, where they are required to propose new solutions and significantly contribute toward the body of knowledge. Students pursue an independent research study, under the guidance of a supervisory panel, for a period of three to four years. Ph.D. thesis research helps train graduates to become leaders in their chosen area of research through partly-supervised study, eventually transforming them into researchers who can work independently or interdependently to carry out cutting-edge research.

CV701 Human and Computer Vision (4CR)

Prerequisites:	Basics of linear algebra, calculus, probability and statistics Proficiency in Python None
Core course for:	M.Sc. in Computer Vision
Elective course for:	M.Sc. in Natural Language Processing; M.Sc. in Machine Learning

This course provides a comprehensive introduction to the basics of human visual system and color perception, image acquisition and processing, linear and nonlinear image filtering, image features description and extraction, classification and segmentation strategies. Moreover, students will be introduced to quality assessment methodologies for computer vision and image processing algorithms.

Course descriptions

CV702 Geometry for Computer Vision (4CR)

Prerequisites:	CV 701: Human and Computer Vision (or equivalent) Hands-on experience with Python and Pytorch
Core course for:	M.Sc. in Computer Vision
Elective course for:	M.Sc. in Machine Learning; M.Sc. in Natural Language Processing

The course provides a comprehensive introduction to the concepts, principles and methods of geometry-aware computer vision, which helps in describing the shape and structure of the world. In particular, the objective of the course is to introduce the formal tools and techniques that are necessary for estimating depth, motion, disparity, volume, pose and shapes in 3D scenes.

CV703 Visual Object Recognition and Detection (4CR)

Prerequisites:	CV701: Human and Computer Vision (or equivalent) Basics of linear algebra, calculus, probability and statistics demonstrated through relevant coursework Proficiency in Python and Pytorch
Core course for:	M.Sc. in Computer Vision
Elective course for:	M.Sc. in Machine Learning; M.Sc. in Natural Language Processing.

This course provides a comprehensive overview of different concepts and methods related to visual object recognition and detection. In particular, the students will learn a large family of successful and recent state-of-the-art architectures of deep neural networks to solve the tasks of visual recognition, detection and tracking.

CV707 Digital Twins (4CR)

Prerequisites:	Basic concepts in programming
Core course for:	None
Elective course for:	M.Sc. in Computer Vision; M.Sc. in Machine Learning; M.Sc. in Natural Language Processing;

This course provides a comprehensive introduction to digital twins. Students will learn about digi-tal twin technology, its common applications, and benefits, how to create a digital twin for pre-dictive analytics using sensory data fusion, and primary predictive modeling methods, and how to implement and interact with a digital twin using different platforms.

CV799 Computer Vision Master's Research (8CR)

Prerequisites:	None
Core course for:	M.Sc. in Computer Vision
Elective course for:	None

Master's thesis research exposes students to an unsolved research problem, where they are required to propose new solutions and contribute toward the body of knowledge. Students pursue an independent research study, under the guidance of a supervisory panel, for a period of one year. Master's thesis research helps train graduates to pursue more advanced research in their Ph.D. degree. Further, it enables graduates to independently pursue an industrial project involving a research component.

Course descriptions

CV801 Advanced Computer Vision (4CR)

Prerequisites:	Understanding of basic image processing and computer vision concepts Hands-on experience with Python and Pytorch or equivalent language/library
Core course for:	Ph.D. in Computer Vision
Elective course for:	Ph.D. in Machine Learning, Ph.D. in Natural Language Processing

This course provides a comprehensive introduction to advanced computer vision techniques. The students will develop skills to critique state-of-the-art computer vision research papers. The course aims at building foundation concepts for modern computer vision as well as developing expertise in several specialized areas of research in computer vision. The following topics will be covered in the course:

(i) Deep learning for computer vision
(ii) Recent developments in convolutional neural networks and transformers
(iii) Advanced techniques in object detection and segmentation
(iv) Advanced Vision applications such as medical image segmentation and remote sensing change detection
(v) Development of efficient computer vision architectures
(vi) Human centric vision
(vii) Introduction to vision language models and diffusion models.

CV802 Advanced 3D Computer Vision (4CR)

Prerequisites:	Linear algebra, numerical methods or equivalent hands-on experience with Python and C++ or equivalent language/library. Basic knowledge in computer vision
Core course for:	Ph.D. in Computer Vision
Elective course for:	Ph.D. in Natural Language Processing; Ph.D. in Machine Learning.

The course exercises an in-depth coverage of special topics in 3D computer vision. Students will be able to critique state-of-the-art methods on multi-view stereo, 3D reconstruction, 3D shape analysis, 3D deep learning and synthesis. Students will have to implement papers to accomplish the following goals: (1) reproduce results reported in the papers, and (2) improve the performance of published peer-reviewed works. This course assumes that the students are familiar with the basic concepts of omputer vision, linear algebra and numerical methods.

CV803 Advanced Techniques in Visual Object Recognition and Detection (4CR)

Prerequisites:	CV801 or equivalent Hands-on experience with Python and Pytorch or equivalent language/ library
Core course for:	Ph.D. in Computer Vision
Elective course for:	Ph.D. in Machine Learning, Ph.D. in Natural Language Processing.

This course provides focused coverage of special topics on visual object recognition (image classification), detection and segmentation. The students will develop skills to critique the state-of-the-art works on visual object recognition, detection and segmentation. Moreover, students will be required to implement papers with the following aims: (1) reproduce results reported in the seminal research papers, and (2) improve the performance of the published works. This course assumes familiarity with fundamental concepts in computer vision and machine learning.

Course descriptions

CV804 3D Geometry Processing (4CR)

Prerequisites:	Linear algebra, C/C++ programming, computer vision, basic AI/ML knowledge
Core course for:	Ph.D. in Computer Vision
Elective course for:	Ph.D. in Machine Learning, Ph.D. in Natural Language Processing, Ph.D. in Robotics, Ph.D. in Computer Science

This course introduces 3D geometry processing, an important field that intersects computer vision, computer graphics, and discrete geometry. This course will cover the mathematical foundations for studying 3D surfaces from a discrete differential geometric standpoint and present the full geometry processing pipeline: from 3D data capture, mesh smoothing, surface reconstruction, parameterization, registration, shape analysis (correspondence, symmetry, matching), data-driven synthesis, interactive manipulation, to 3D printing. This course will offer practical coding exercises to understand basic geometry processing algorithms and exciting project around data capture and geometry processing.

CV805 Life-long Learning Agents for Vision (4CR)

Prerequisites:	Basics of linear algebra, calculus, computer vision/machine learning and probability and statistics demonstrated through relevant coursework Proficiency in Python and Pytorch
Core course for:	None
Elective course for:	Ph.D. in Computer Vision; Ph.D. in Natural Language Processing; Ph.D. in Machine Learning

In the field of computer vision, models have typically been trained to perform well on a specific task or dataset by maximizing performance on a validation set. However, this approach only represents a small part of the types of scenarios that are of interest in real-world applications. In recent years, there has been growing interest in exploring different approaches to learning that can be applied in more diverse and dynamic environments. These approaches, which include lifelong learning, continual learning, meta-learning, transfer learning, multi-task learning, and out-of-distribution generalization, aim to enable models to be more robust, efficient, versatile, and well-behaved in non-stationary settings. This graduate course will focus on these emerging learning paradigms and how they can be applied to computer vision and multimodal learning tasks.

CV899 Computer Vision Ph.D. Research Thesis (32CR)

Prerequisites:	Coursework + pass in Qualifying Exam
Core course for:	Ph.D. in Computer Vision
Elective course for:	None

Ph.D. thesis research exposes students to cutting-edge and unsolved research problems, where they are required to propose new solutions and significantly contribute toward the body of knowledge. Students pursue an independent research study, under the guidance of a supervisory panel, for a period of three to four years. Ph.D. thesis research helps train graduates to become leaders in their chosen area of research through partly-supervised study – eventually transforming them into researchers who can work independently or interdependently to carry out cutting-edge research.

DS701 Data Mining (4CR)

Prerequisites:	Discrete mathematics, probability and statistics Proficiency in Java or Python
Core course for:	None
Elective course for:	M.Sc. in Computer Vision; M.Sc. in Machine Learning; M.Sc. in Natural Language Processing; M.Sc. in Robotics; M.Sc. in Computer Science

This course is an introductory course on data mining, which is the process of discovering patterns in large data sets involving methods at the intersection of machine learning, statistics, and database systems.

Course descriptions

DS702 Big Data Processing (4CR)

Prerequisites:	Databases Proficiency in Java or Python
Core course for:	None
Elective course for:	M.Sc. in Computer Vision; M.Sc. in Machine Learning; M.Sc. in Natural Language Processing; M.Sc. in Robotics; M.Sc. in Computer Science

This course is an introductory course on big data processing, which is the process of analyzing and utilizing big data. The course involves methods at the intersection of parallel computing, machine learning, statistics, database systems, etc.

DS703 Information Retrieval (4CR)

Prerequisites:	Discrete Mathematics, Probability and Statistics. Proficiency in Java or Python or C++.
Core course for:	None
Elective course for:	MSc in Computer Vision; MSc in Machine Learning; MSc in Natural Language Processing;

This course is an introductory course on Information Retrieval (IR). The explosive growth of available digital information (e.g., Web pages, emails, news, Tweets, Wikipedia pages) demands intelligent information agents that can sift through all available information and find out the most valuable and relevant information. Web search engines, such as Google and Bing, are several examples of such tools. This course studies the basic principles and practical algorithms used for information retrieval and text mining. It will cover algorithms, design, and implementation of modern information retrieval systems. Topics include: retrieval system design and implementation, text analysis techniques, retrieval models (e.g., Boolean, vector space, probabilistic, and learning-based methods), search evaluation, retrieval feedback, search log mining, and applications in web information management.

DS704 Statistical Aspect of Machine Learning / Statistical Theory (4CR)

Prerequisites:	Familiarity with the fundamental concepts of probability theory, Linear Algebra, Real analysis. A first course in Statistics would be a plus. ML701 or AI701.
Core course for:	None
Elective course for:	MSc in Machine Learning;

This course covers the fundamentals of theoretical statistics, which are the foundation for the analysis of the properties of machine learning algorithms. Covered topics include statistical models, statistical inference, maximum likelihood estimation, optimal hypothesis testing, decision theory and Bayesian inference, non-parametric statistics, and Bootstrap, (generalized) linear model and high dimensional statistics. All necessary tools from Probability theory: deviation inequalities, type of convergence, law of large numbers, central limit theorem, properties of the Gaussian distribution (etc) will be introduced whenever needed and their proofs given at the end of each chapter.

HC701 Medical Imaging: Physics and Analysis (4CR)

Prerequisites:	Familiarity with Python programming Undergraduate course in signal processing or signals and systems MTH701
Core course for:	None
Elective course for:	M.Sc. in Machine Learning; M.Sc. in Computer Vision; M.Sc. in Natural Language Processing; M.Sc. in Robotics

This course provides a graduate-level introduction to the principles and methods of medical imaging, with a thorough grounding in the physics of imaging problems. This course covers the fundamentals of X-ray, CT, MRI, ultrasound, and PET imaging. In addition, the course provides an overview of 3D geometry of medical images and the two classic problems in the analysis of medical images: segmentation and registration.

Course descriptions

INT799 Master of Science – Internship (2CR)

Prerequisites:	Prior to undertaking an internship, students must have successfully completed 24 credit hours
Core course for:	M.Sc. Machine Learning, M.Sc. Natural Language Processing, M.Sc. Computer Vision, M.Sc. Robotics, M.Sc. Computer Science
Elective course for:	None

The MBZUAI internship with industry is intended to provide the student with hands-on experience, blending practical experiences with academic learning.

INT899 Ph.D. Internship (2CR)

Prerequisites:	Prior to undertaking an internship opportunity, students must have successfully completed 24 credit hours
Core course for:	Ph.D. Machine Learning, Ph.D. Natural Language Processing, Ph.D. Computer Vision, Ph.D. Robotics, Ph.D. Computer Science
Elective course for:	None

The MBZUAI internship with industry is intended to provide the student with hands-on experience, blending practical experiences with academic learning.

ML701 Machine Learning (4CR)

Prerequisites:	Basic concepts in calculus, linear algebra and programming
Core course for:	M.Sc. in Machine Learning;
Elective course for:	M.Sc. in Computer Vision; M.Sc. in Natural Language Processing; M.Sc. in Robotics

This course provides a comprehensive introduction to machine Learning. It builds upon fundamental concepts in mathematics, specifically probability and statistics, linear algebra, and calculus. Students will learn about supervised and unsupervised learning, various learning algorithms, and the basics of learning theory, graphical models, and reinforcement learning.

ML 703 Probabilistic and Statistical Inference (4CR)

Prerequisites:	Familiarity with fundamental concepts in probability, linear algebra, statistics, and programming MTH701 – Mathematical Foundations for AI
Core course for:	M.Sc. in Machine Learning
Elective course for:	M.Sc. in Computer Vision; M.Sc. in Natural Language Processing; M.Sc. in Robotics

Probabilistic and statistical inference is the process of drawing useful conclusions about data populations or scientific truths from uncertain and noisy data. It is the foundation and an essential component of machine learning since machine learning aims to learn and improve from experience (which is represented by data). This course will cover the different modes of performing inference, including statistical modelling, data-oriented strategies, and explicit use of designs and randomization in analyses. Furthermore, it will provide in-depth treatment to the broad theories (frequentists, Bayesian, likelihood) and numerous practical complexities (missing data, observed and unobserved confounding, biases) for performing inference. This course presents the fundamentals of statistical and probabilistic inference and shows how these fundamental concepts are applied in practice.

Course descriptions

ML 707 Smart City Services and Applications (4CR)

Prerequisites:	Basic concepts in calculus, linear algebra and programming, and basic AI/ML knowledge
Core course for:	None
Elective course for:	M.Sc. in Computer Vision; M.Sc. in Machine Learning; M.Sc. in Natural Language Processing; M.Sc. in Robotics

This course comprehensively introduces using AI/ML in smart city services and applications. The course will start by reviewing basic concepts. Students will learn how to apply AI/ML to develop, design, and improve smart city services. They will be able to demonstrate an understanding of the smart city concept, applications, requirements, and system design. They will develop capabilities of integrating emerging technologies in smart city components and be able to implement them. In addition, they will gain knowledge in applying security, data analytics, Internet of Things (IoT), communications, and networking and work on case studies solutions for smart city infrastructures.

ML708 Trustworthy Artificial Intelligence (4CR)

Prerequisites:	ML701 or CV701 or NLP701 Basic understanding of machine learning concepts and algorithms
Core course for:	None
Elective course for:	M.Sc. in Machine Learning; M.Sc. in Computer Vision; M.Sc. in Natural Language Processing; M.Sc. in Robotics;

This course provides students with a comprehensive introduction to various trust-related issues in artificial intelligence and machine learning applications. Students will learn about attacks against computer systems that use machine learning and defense mechanisms to mitigate such attacks.

ML709 IoT of things, Services and Applications (4CR)

Prerequisites:	Basic concepts in calculus, linear algebra and programming, and basic AI/ML knowledge
Core course for:	None
Elective course for:	M.Sc. in Machine Learning; M.Sc. in Computer Vision; M.Sc. in Natural Language Processing; M.Sc. in Robotics;

This course provides a comprehensive introduction to using AI/ML in Internet of Things (IoT) smart systems, services and applications. The course will start by reviewing advanced concepts. Students will learn how to apply AI/ML to develop, design and improve IoT systems and services. They will be able to demonstrate an understanding of IoT concepts, applications, requirements and system design. They will develop capabilities of integrating emerging technologies in smart IoT components and be able to implement them. In addition, they will gain knowledge and skills in applying security, data analytics, AI models, communications and networking and work on case study solutions for IoT infrastructures.

ML710 Parallel and Distributed Machine Learning Systems (4CR)

Prerequisites:	AI701 or equivalent
Core course for:	None
Elective course for:	MSc in Machine Learning; MSc in Computer Vision; MSc in Natural Language Processing

As Machine Learning (ML) programs increase in data and parameter size, their growing computational and memory requirements demand parallel and distributed execution across multiple network-connected machines. In this course, students will learn the fundamental principles and representations for parallelizing ML programs and learning algorithms. Students will also learn how to design and evaluate (using standard metrics) and compare between complex parallel ML strategies composed out of basic parallel ML “aspects” and evaluate and compare between the architecture of different software systems that use such parallel ML strategies to execute ML programs. Students will also use standard metrics to explain how compilation and resource management affects the performance of parallel ML programs.

Course descriptions

ML799 Machine Learning Master's Research Thesis (8CR)

Prerequisites:	None
Core course for:	None
Elective course for:	M.Sc. in Machine Learning

Master's thesis research exposes students to an unsolved research problem, where they are required to propose new solutions and contribute toward the body of knowledge. Students pursue an independent research study, under the guidance of a supervisory panel, for a period of one year. Master's thesis research helps train graduates to pursue more advanced research in their Ph.D. degree. Further, it enables graduates to independently pursue an industrial project involving research component.

ML801 Foundations and Advanced Topics in Machine Learning (4CR)

Prerequisites:	Linear algebra, probability Proficiency in Python Basic knowledge of machine learning
Core course for:	Ph.D. in Machine Learning
Elective course for:	Ph.D. in Computer Vision, Ph.D. in Natural Language Processing

This course focuses on building foundations and introducing recent advances in machine learning, and on developing skills for performing research to advance the state of the art in machine learning. This course builds upon basic concepts in machine learning and additionally assumes familiarity with fundamental concepts in optimization and math.
The course covers foundations and advanced topics in probability, statistical machine learning, supervised and unsupervised learning, deep neural networks, optimization, reinforcement learning, and causality. Students will be engaged through coursework, assignments, and projects.

ML802 Advanced Machine Learning (4CR)

Prerequisites:	Linear algebra, probability Proficiency in Python Basic knowledge of machine learning
Core course for:	Ph.D. in Machine Learning
Elective course for:	Ph.D. in Computer Vision; Ph.D. in Natural Language Processing

This course is designed to explore recent breakthroughs in machine learning and provide students with the necessary skills to conduct research and advance the field of machine learning. It will cover highly specialized topics related to large-scale optimization for real-world problems, including large-scale training of kernel methods, sparse learning, bilevel optimization, black box optimization, and spiking neural networks. Prior knowledge of fundamental concepts in machine learning, optimization, and statistics is assumed.

ML803 Advanced Probabilistic and Statistical Inference (4CR)

Prerequisites:	Basic knowledge of linear algebra, statistics, probability, calculus, and statistical inference
Core course for:	Ph.D. in Machine Learning
Elective course for:	Ph.D. in Computer Vision; Ph.D. in Natural Language Processing

The study of probabilistic and statistical inference deals with the process of drawing useful conclusions about data populations or scientific truths from uncertain and noisy data. This course will cover some highly specialized topics related to statistical inference and their application to real-world problems. The main topics covered in this course are latent variable learning, kernel methods and approximate probabilistic inference strategies. This course will provide an in-depth treatment to various learning techniques (likelihood, Bayesian and max-margin) and numerous practical complexities (missing data, observed and unobserved confounding, biases) for performing inference.

Course descriptions

ML804 Advanced Topics in Continuous Optimization (4CR)

Prerequisites:	Basic optimization class Basics of linear algebra, calculus, trigonometry, probability and statistics Proficiency in Python, PyTorch
Core course for:	Ph.D. in Machine Learning
Elective course for:	Ph.D. in Natural Language Processing, Ph.D. in Computer Vision

The course covers advanced topics in continuous optimization, such as stochastic gradient descent and its variants, methods that use more than first-order information, primal-dual methods, and methods for composite problems. Participants will read the current state-of-the-art relevant literature and prepare presentations to the other students.
Participants will explore how the presented methods work for optimization problems that arise in various fields of machine learning and test them in real-world optimization formulations to get a deeper understanding of the challenges being discussed.

ML806 Advanced Topics in Reinforcement Learning (4CR)

Prerequisites:	Good understanding of basic RL Basics of linear algebra, calculus, trigonometry, probability and statistics Proficiency in Python and good knowledge of PyTorch library
Core course for:	None
Elective course for:	Ph.D. in Machine Learning; Ph.D. in Computer Vision; Ph.D. in Natural Language Processing, Ph.D. in Robotics

The course covers advanced topics in reinforcement learning (RL). Participants will read current, state-of-the-art relevant literature and prepare presentations to the other students. Participants will explore how the presented methods work in simplified computing environments to get a deeper understanding of the challenges that are being discussed. Topics discussed include exploration, imitation learning, hierarchical RL and multi-agent RL in both competitive and collaborative settings. The course will also explore multi-task and transfer learning in RL setting.

ML807 Federated Learning (4CR)

Prerequisites:	Understanding of ML principles and basic algorithms Good knowledge of multivariate calculus, linear algebra, optimization, probability, and algorithms Proficiency in some ML framework, e.g., PyTorch and TensorFlow
Core course for:	None
Elective course for:	Ph.D. in Machine Learning; Ph.D. in Computer Vision, Ph.D. in Robotics, Ph.D. in NLP

This is a graduate course in a new branch of machine learning: federated learning (FL). In FL, machine learning models are trained on mobile devices with an explicit effort to preserve the privacy of users' data. FL combines supervised machine learning, privacy, distributed and edge computing, optimization, communication compression, and systems. This is a new and fast-growing field with few theoretical results and early production systems (e.g., Tensor Flow Federated and FedML). This course aims for students to become familiar with the field's key developments and practices, namely optimization methods for FL and techniques to address communication bottlenecks, systems and data heterogeneities, client selection, robustness, fairness, personalization and privacy aspects of FL. The evaluation of the course heavily relies on students' paper presentations and the final project selected by the student

Course descriptions

ML808 Advanced Topics in Causality and Machine Learning (4CR)

Prerequisites:	Basics of Machine Learning Basics of Python (or Matlab) or PyTorch
Core course for:	None
Elective course for:	Ph.D. in Machine Learning; Ph.D. in Computer Vision; Ph.D. in Natural Language Processing; Ph.D. in Robotics

In the past decades, interesting advances were made in machine learning, philosophy, and statistics for tackling long-standing causality problems, including how to discover causal knowledge from observational data, known as causal discovery, and how to infer the effect of interventions. Furthermore, it has recently been shown that the causal perspective may facilitate understanding and solving various machine learning/artificial intelligence problems such as transfer learning, semi-supervised learning, out-of-distribution prediction, disentanglement, and adversarial vulnerability. This course is concerned with understanding causality, learning causality from observational data, and using it to tackle a large class of learning problems. The course will include topics such as graphical models, causal inference, causal discovery, and counterfactual reasoning. It will also discuss how we can learn causal representations, perform transfer learning, and understand deep generative models.

ML 812 Advanced Topics in Algorithms for Big Data (4CR)

Prerequisites:	Good knowledge of calculus, linear algebra, probability, and statistics
Core course for:	None
Elective course for:	Ph.D. in Machine Learning; Ph.D. in Computer Vision; Ph.D. in Natural Language Processing.

This course is an advanced course on algorithms for big data that involves the use of randomized methods, such as sketching and sampling, to provide dimensionality reduction. It also discussed topics such as sub-space embeddings, low rank approximation, L1 regression, and data streams. The course lies at the intersection of machine learning and statistics.

ML899 Machine Learning Ph.D. Research Thesis (32CR)

Prerequisites:	Coursework + pass in qualifying exam
Core course for:	Ph.D. in Machine Learning
Elective course for:	None

Ph.D. thesis research exposes students to cutting-edge and unsolved research problems, where they are required to propose new solutions and significantly contribute toward the body of knowledge. Students pursue an independent research study, under the guidance of a supervisory panel, for a period of three to four years. Ph.D. thesis research helps train graduates to become leaders in their chosen area of research through partly-supervised study – eventually transforming them into researchers who can work independently or interdependently to carry out cutting-edge research.

MTH701 Mathematical Foundations of Artificial Intelligence (4CR)

Prerequisites:	None
Core course for:	M.Sc. in Machine Learning; M.Sc. in Computer Vision; M.Sc. in Natural Language Processing;
Elective course for:	M.Sc. in Robotics

This course provides a comprehensive mathematical foundation for the field of artificial intelligence. It builds upon fundamental concepts in linear algebra, probability theory, statistics, and calculus. Students will learn how these mathematical concepts can be used to solve problems frequently encountered in AI applications.

Course descriptions

MTH702 Optimization (4CR)

Prerequisites:	Linear algebra, matrix analysis, probability, and statistics.
Core course for:	None
Elective course for:	M.Sc. in Machine Learning

This course provides a graduate-level introduction to the principles and methods of optimization, with a thorough grounding in the mathematical formulation of optimization problems. The course covers fundamentals of convex functions and sets, first order and second order optimization methods, problems with equality and/or inequality constraints, and other advanced problems.

MTH703 Mathematics for Theoretical Computer Science (4CR)

Prerequisites:	None
Core course for:	M.Sc. in Computer Science
Elective course for:	None

The course is designed to comprehensively understand various mathematical concepts and their applications for theoretical computer science. The lectures will cover topics such as asymptotics, the central limit theorem, Chernoff bounds, mathematical problem solving, computational models, spectral graph theory, linear programming, semidefinite programming, error correcting codes, derandomization, expander graphs, constraint satisfaction problems, treewidth, analysis of Boolean functions, communication complexity, information theory, LP hierarchies and proof complexity, quantum computation, cryptography, hardness assumptions, and the sketch of the PCP theorem.

NLP701 Natural Language Processing (4CR)

Prerequisites:	Basic concepts in linear algebra, calculus, probability and statistics Programming in Python or similar language.
Core course for:	M.Sc. in Natural Language Processing
Elective course for:	M.Sc. in Computer Vision; M.Sc. in Machine Learning; M.Sc. in Robotics; M.Sc. in Computer Science.

This course provides a comprehensive introduction to natural language processing. It builds upon fundamental concepts in mathematics, specifically probability and statistics, linear algebra, and calculus, and assumes familiarity with programming.

NLP702 Advanced Natural Language Processing (4CR)

Prerequisites:	NLP701, Basic concepts in linear algebra, calculus, probability and statistics Pro-gramming in Python or a similar language
Core course for:	M.Sc. in Natural Language Processing
Elective course for:	M.Sc. in Computer Vision; M.Sc. in Machine Learning; M.Sc. in Robotics; M.Sc. in Computer Science

This course provides a methodological and an in-depth background on key core natural language processing areas based on deep learning. It builds upon fundamental concepts in natural language processing and assumes familiarity with mathematical and machine learning concepts and programming.

NLP703 Speech Processing (4CR)

Prerequisites:	NLP701 Basic concepts in linear algebra, calculus, probability and statistics Programming in Python or a similar language
Core course for:	None
Elective course for:	M.Sc. in Natural Language Processing; M.Sc. in Computer Vision; M.Sc. in Machine Learning; M.Sc. in Computer Science; M.Sc. in Robotics

This course provides a comprehensive introduction to speech processing. It builds upon fundamental concepts in speech processing and assumes familiarity with mathematical and signal processing concepts.

Course descriptions

NLP799 Natural Language Processing Master Research Thesis (8CR)

Prerequisites:	Coursework
Core course for:	MSc in Natural Language Processing
Elective course for:	None

Masters thesis research exposes students to an unsolved research problem, where they are required to propose new solutions and contribute towards the body of knowledge. Students pursue an independent research study, under the guidance of a supervisory panel, for a period of 1 year. Masters thesis research helps train graduates to pursue more advanced research in their PhD degree. Further, it enables graduates to independently pursue an industrial project involving a research component.

NLP801 Deep Learning for Language Processing (4CR)

Prerequisites:	Understanding of calculus, algebra, probability, and statistics Programming in Python or a similar language
Core course for:	Ph.D. in Natural Language Processing
Elective course for:	Ph.D. in Computer Vision; Ph.D. in Machine Learning; Ph.D. in Robotics; Ph.D. in Computer Science.

This course focuses on recent advances in natural language processing and on developing skills for performing research to advance the state of the art in natural language processing.

NLP802 Current Topics in Natural Language Processing (4CR)

Prerequisites:	Understanding of calculus, algebra, probability, and statistics Programming in Python or similar language
Core course for:	Ph.D. in Natural Language Processing
Elective course for:	Ph.D. in Computer Vision; Ph.D. in Machine Learning; Ph.D. in Robotics; Ph.D. in Computer Science.

This course focuses on recent topics in natural language processing and on developing skills for performing research to advance the state of the art in natural language processing.

NLP803 Advanced Speech Processing (4CR)

Prerequisites:	Understanding of calculus, algebra, probability, and statistics.
Core course for:	Ph.D. in Natural Language Processing
Elective course for:	Ph.D. in Computer Vision; Ph.D. in Machine Learning; Ph.D. in Computer Science, Ph.D. in Robotics

This course focuses on developing knowledge about the state of the art in a wide range of speech processing tasks, and readiness for performing research to advance the state of the art in these topics.

NLP804 Deep Learning for Natural Language Generation (4CR)

Prerequisites:	Basic concepts in linear algebra, calculus, probability and statistics, Programming skills in Python
Core course for:	Ph.D. in Natural Language Processing
Elective course for:	Ph.D. in Computer Vision; Ph.D. in Machine Learning; Ph.D. in Robotics; Ph.D. in Computer Science.

The course introduces students to the emerging topic of natural language generation and prepares them to perform research to advance the state of the art in this research area.

Course descriptions

NLP899 Natural Language Processing Ph.D. Research Thesis (32CR)

Prerequisites:	Coursework + pass in qualifying exam
Core course for:	Ph.D. in Natural Language Processing
Elective course for:	None

Ph.D. thesis research exposes students to cutting-edge and unsolved research problems, where they are required to propose new solutions and significantly contribute toward the body of knowledge. Students pursue an independent research study, under the guidance of a supervisory panel, for a period of three to four years. Ph.D. thesis research helps train graduates to become leaders in their chosen area of research through partly-supervised study – eventually transforming them into researchers who can work independently or interdependently to carry out cutting-edge research.

RES799 Introduction to Research Methods (2CR)

Prerequisites:	None
Core course for:	MSc in Machine Learning; MSc in Computer Vision, MSc in Robotics; MSc. in Natural Language Processing; MSc in Computer Science.
Elective course for:	None

This course focuses on teaching students how to develop innovative research-based approaches that can be implemented in an organization. It covers various research designs and methods, including scientific methods, ethical issues in research, measurement, experimental research, survey research, qualitative research, and mixed methods research. Students will gain knowledge in selecting, evaluating, and collecting data to address specific research questions. Additionally, they will learn design thinking skills to connect their research-based topic to practicality. After completing the course, students will have the skills to develop a full research topic that can be innovative, entrepreneurial, and sustainable and can be applied in any organization related to the topic of research.

RES899 Advanced Research Methods (2CR)

Prerequisites:	None
Core course for:	PhD in Machine Learning; PhD in Computer Vision, PhD in Robotics; PhD in Natural Language Processing; PhD in Computer Science.
Elective course for:	None

This course will prepare students to produce professional-quality research and solve a practical research challenge in an organization based on an innovative, sustainable, and entrepreneurial research topic. This course will provide exposure to various special topics, research integrity, ethics, organizational challenges, and needs related to various disciplines. Students will design and implement a research project suitable for conference presentations or journal submissions relevant to their field of interest, in addition to peer-reviewing a paper. As appropriate, the instructor and guest lecturers will present topics necessary to develop well-rounded researchers, innovators, and entrepreneurs in the AI disciplines.

ROB701 Introduction to Robotics (4CR)

Prerequisites:	Basics of linear algebra, calculus, trigonometry, probability and statistics, Proficiency in Python
Core course for:	M.Sc. in Robotics
Elective course for:	M.Sc. in Machine Learning; M.Sc. in Computer Vision; M.Sc. in Natural Language Processing, M.Sc. in Computer Science.

The course covers the mathematical foundation of robotic systems and introduces students to the fundamental concepts of robot operating system (ROS) as one of the most popular and reliable platforms to program modern robots. It also highlights techniques to model formally and study robot kinematics, dynamics, perception, motion control, navigation, and path planning. Students will also learn the interface of different types of sensors, read and analyze their data, and apply it in various robotic applications.

Course descriptions

ROB702 Robotic Vision and Intelligence (4CR)

Prerequisites:	AI701 , ROB701 , Basics of linear algebra, calculus, probability and statistics Proficiency in Python, Pytorch
Core course for:	M.Sc. in Robotics
Elective course for:	None

Robots must be able to sense and learn from experience to achieve autonomy. The most frequently used sensing technique is vision. We will explore both the fundamental techniques used in image processing and computer vision analysis (localize objects, recognize objects, segment images) together with advanced tools that allow robots to estimate the motion of objects, estimate depth or reconstruct 3D scenes from a set of images. To give robots the ability to learn, we will explore reinforcement learning (RL). RL is a subfield of ML that is inspired by how humans learn. The RL agent interacts with its environment, observes the impact of its actions, and receives rewards (positive or negative, depending on how well it accomplishes a given task). We cover both the fundamental and advanced RL algorithms and discuss their advantages and disadvantages in various robotics settings.

ROB703 Robot Localization and Navigation (4CR)

Prerequisites:	ROB701 , Basics of linear algebra, calculus, probability and statistics Proficiency in Python and ROS/Gazebo
Core course for:	M.Sc. in Robotics
Elective course for:	None

The course covers different topics and techniques within the context of mapping, localization, and navigation. It highlights simultaneous localization and mapping (SLAM) methods using various types of filters, such as Kalman filter, extended Kalman filter (EKF) and particle filter. It investigates grid- and graph-based SLAM and data association. It puts in perspective map-based and reactive navigation techniques. To reinforce these concepts and methods, they are applied within robot operating system (ROS) through dedicated state-of-the-art ROS packages, such as the tf package, AMCL, and mapping.

ROB799 Robotics M.Sc. Research Thesis (8CR)

Prerequisites:	None
Core course for:	M.Sc. in Robotics
Elective course for:	None

Master's thesis research exposes students to an unsolved research problem, where they are required to propose new solutions and contribute toward the body of knowledge. Students pursue an independent research study, under the guidance of a supervisory panel, for a period of one year. Master's thesis research helps train graduates to pursue more advanced research in their Ph.D. degree. Further, it enables graduates to pursue an industrial project involving a research component independently.

ROB801 Advanced Robotic Motion Planning (4CR)

Prerequisites:	ROB701 or equivalent, Basics of linear algebra, calculus, probability and statistics, Proficiency in programming (data structures, algorithms) and ROS/Gazebo
Core course for:	Ph.D. in Robotics
Elective course for:	None

Motion planning is an integral component of robotic applications. It helps the robot to decide strategically on its future moves and when to take them. The course covers state-of-the-art motion planning techniques along with their applications to different kinds of robots (e.g., ground, aerial, marine, humanoid, manipulator). It provides a theoretical in-depth analysis of such methods and teaches students how to implement them through several programming-based assignments.

Course Descriptions

ROB802 Advanced Topics in Robotics: Multi-Robot Systems (4CR)

Prerequisites:	ROB701 or equivalent , Basics of linear algebra, calculus, probability and statistics Proficiency in Python and ROS/Gazebo
Core course for:	Ph.D. in Robotics
Elective course for:	None

The course covers the foundations of multi-robot systems. It introduces students to state-of-the-art, multi-robot research through a combination of classical teaching and seminar-style lec-tures and labs. Students will learn how to apply a consortium of techniques, such as stochastic processes, graph theoretic methods, geometric concepts, and optimization principles, to model, analyze, and drive multi-robot systems.

ROB803 Advanced Humanoid Robotics (4CR)

Prerequisites:	ROB701 or equivalent, Basics of linear algebra, calculus, probability and statistics Proficiency in programming in Python or C/C++, Experience with ROS/Gazebo.
Core course for:	Ph.D. in Robotics
Elective course for:	None

Humanoid robots have become more and more prevalent with the increase in the demand of service and human-assistive robots. This specialized course covers various advanced topics in state-of-the-art humanoid robots, such as their kinematics, dynamics, modeling, control, motion planning, object grasping and manipulation, perception, learning, and interaction with humans. The course provides a blend of theoretical in-depth analysis of such techniques and hands-on practice through simulation and hardware implementation.

ROB804 Vision for Autonomous Robotics (4CR)

Prerequisites:	Hands-on experience with Python and Pytorch, or equivalent lan-guage/ library, Basics of linear algebra, calculus, probability and statistics
Core course for:	Ph.D. in Robotics
Elective course for:	Ph.D. in Computer Vision

This Ph.D. course focuses on the key advanced computer vision techniques utilized in autonomous robotics, such as image formation, feature detection and description, multiple view geometry, dense reconstruction, tracking, event-based vision, visual-inertial odometry, visual simultaneous localization and mapping (SLAM), locomotion concepts, and deep learning based visual positioning.

ROB899 Robotics Ph.D. Research Thesis (32CR)

Prerequisites:	Coursework + pass in qualifying exam
Core course for:	Ph.D. in Robotics
Elective course for:	None

Ph.D. thesis research exposes students to cutting-edge and unsolved research problems, where they are required to propose new solutions and significantly contribute toward the body of knowledge. Students pursue an independent research study, under the guidance of a supervisory panel, for a period of three to four years. Ph.D. thesis research helps train graduates to become leaders in their chosen area of research through partly-supervised study – eventually transforming them into researchers who can work independently or interdependently to carry out cutting-edge research.

Appendix 2:

Definitions

Academic integrity	Refers to ethical behavior and principles such as honesty, responsibility, respect and fairness that guides conduct in an academic setting.
Non-academic research	Is any type of non-peer reviewed research activity such as; outreach to the broader community, engagement with government agencies and industrial partners
Academic standing	Determined by regulations governing good standing, probation, and dismissal.
Academic year	The period of time beginning with the first day of classes of a fall semester and the final day of the spring semester.schedules by dropping or adding course/s.the final day of the spring semester.
Add and drop	A period of time at the beginning of each semester when students can adjust schedules by dropping or adding course/s.other matters. The student is called an “advisee”.
Supervisor	Faculty member/administrator assigned to counsel students on academic or other matters. The student is called an “advisee”.
Master’s degree	Graduate degree in which a student completes six courses in the first year and thesis requirements in the second year which adds up to 24 months.
Doctor’s degree	Graduate degree in which a student completes six courses in the first year and thesis requirements in the following three years which adds up to 48 months.
Academic calendar	Annual listing of all official important dates and deadlines for the academic year.
Course	A unit of study that may utilize lecture, discussion, laboratory, research, recitation, seminar, workshop, studio, independent study, internship or other similar teaching formats to facilitate learning for a student. A course consists of a number of instructional activities over a prescribed period of time. It deals with a single subject and is commonly described by title, number, credits, and expected learning outcomes in the institution’s Catalog.
Course load	Total credits for which a student is registered in a given semester or a faculty member is assigned to teach
Credit	One semester credit equals approximately 1 hour of time in class per week over a semester of 15 weeks or longer. It is assumed that a student spends two hours outside of class in independent learning or specific course assignments for every hour in class. This implies that one academic credit equates to a 45-hour commitment to learning over a semester.
Curriculum	The term refers both to the range of courses offered by an institution, and to a set of related courses constituting an area of specialization, such as the computer science curriculum or the machine learning curriculum.
Internship	The term applies to an experience in which a student has a program-related assignment involving attachment to a recognized business, agency or organization.
Full-time student	Any admitted student who is eligible for MBZUAI scholarship and should be registered on full course load each semester.
Dismissal	The involuntary separation of a student from MBZUAI for unacceptable conduct or unsatisfactory academic achievement. A student is academically dismissed when he/she fails to achieve academic good standing in two consecutive semesters.
Educational records	Records directly related to the education and academic performance of a student that are maintained by the Registrar’s Office.

Appendix 2:

Definitions

MBZUAI - related research projects and activities	Research projects and activities undertaken by MBZUAI faculty and researchers that will be branded as part of the MBZUAI activities. The name of individual MBZUAI faculty members and/or researchers can but does not need to, be associated with the activity or project.
Elective course	A course selected at a student's discretion after consultation with the academic Supervisor.
Good standing	Academic designation applied to a graduate student who has achieved a cumulative GPA of 3.3 or higher.
GPA	Grade point average of the grades earned in MBZUAI courses.
Grade points	The numerical value associated with each grade.
Academic probation	Status of any graduate student who has less than 3.3 cumulative GPA.
ID card	University student identification card providing and controlling access to University facilities and services.
Prerequisite	A course required to be completed prior to registration in an advanced course.
Academic probation	Status of any graduate student who has less than 3.3 cumulative GPA.
Registration	The process of enrolling students in classes.
Reinstatement	The exceptional act of approving an academically dismissed student to resume studies following dismissal. Academically dismissed students who have been away longer than one semester may not apply for reinstatement.
Readmission	The act of admitting a student back into the MBZUAI through the admissions office after an interruption of studies. Academically dismissed students are not eligible for readmission.
Required courses	Courses necessary for the completion of a particular program.
Classes schedule	A list of courses offered during a semester that specifies the days, hours, and locations of classes and the names of the instructors.
Student schedule	A listing of courses a student is taking in a given semester that specifies the dates, hours, locations of classes and the names of the instructors.
Suspension	The involuntary separation of a student from the University for unacceptable conduct. Suspension extends from one semester to a maximum of one calendar year.
Syllabus	Descriptive outline and summary of topics to be covered in a course offered at MBZUAI, as per the standards of CAA.
Semester	Either of the two periods of instruction into which the academic year is divided.
Transcript	A student's historical academic record.
Transfer credit	Credit from course work completed at another institution that is accepted at MBZUAI and which may or may not be applicable toward a specific MBZUAI degree.
Tuition	Fees charged for courses each semester.
Visiting student	A student enrolled at another accredited institution who receives permission to register at MBZUAI for up to two semesters to earn credit to transfer back to his or her home institution.
Withdrawal	The act of officially leaving MBZUAI for reasons other than graduation.

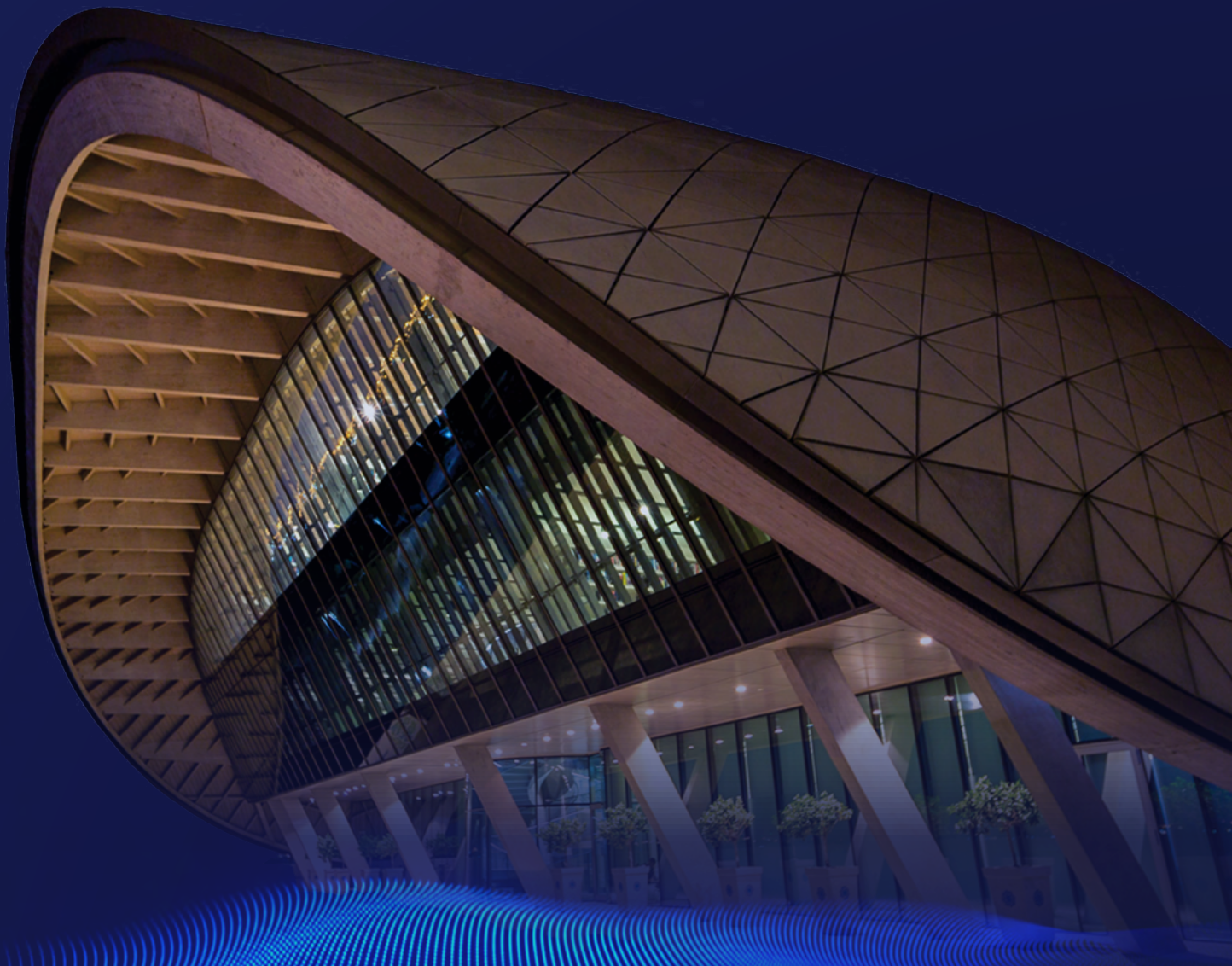
Appendix 3:

Faculty

You may view the faculty directory at mbzuai.ac.ae/faculty-directory

Professor Eric Xing	President and Professor of Computer Science and Ma-chine Learning
Professor Michael Jordan	Laureate Professor and Honorary Program Director
Professor Sir Michael Brady	Adjunct Distinguished Professor
Professor Timothy Baldwin	Acting Provost, Associate Provost for Academic Affairs, Department Chair of Natural Language Processing.
Dr. Kun Zhang	Associate Professor of Machine Learning and Director of CIAI
Professor Le Song	Professor and Department Chair of Machine Learning
Professor Abdulmotaleb El Saddik	Professor and Acting Department Chair of Computer Vision
Professor Preslav Nakov	Professor and Acting Deputy Chair of Natural Language Processing
Professor Mohsen Guizani	Professor of Machine Learning
Dr. Fahad Khan	Professor of Computer Vision
Dr. Salman Khan	Associate Professor of Computer Vision
Dr. Hao Li	Associate Professor of Computer Vision
Dr. Karthik Nandakumar	Associate Professor of Computer Vision
Dr. Martin Takac	Associate Professor of Machine Learning
Dr. Hanan Al Darmaki	Assistant Professor of Natural Language Processing
Dr. Rao Muhammad Anwer	Assistant Professor of Computer Vision
Dr. Hisham Cholakkal	Assistant Professor of Computer Vision
Dr. Hang Dai	Assistant Professor of Computer Vision
Dr. Bin Gu	Assistant Professor of Machine Learning
Dr. Qirong Ho	Assistant Professor of Machine Learning
Dr. Samuel Hovarth	Assistant Professor of Machine Learning
Dr. Muhammad Haris Khan	Assistant Professor of Computer Vision
Dr. Shangsong Liang	Assistant Professor of Machine Learning
Dr. Huan Xiong	Assistant Professor of Machine Learning
Dr. Zhiqiang Xu	Assistant Professor of Machine Learning
Dr. Mohammad Yaqub	Associate Professor of Computer Vision
Professor Najwa Aaraj	Adjunct Professor of Machine Learning
Professor Merouane Debbah	Adjunct Professor of Machine Learning
Professor Eric Moulines	Adjunct Professor of Machine Learning
Dr. Shahrukh Hashmi	Adjunct Associate Professor of Computer Vision
Dr. Shijian Lu	Adjunct Associate Professor of Computer Vision
Dr. Pengtao Xie	Adjunct Professor of Machine Learning
Dr. Yuanzhi Li	Affiliated Associate Professor of Computer Vision
Dr. Shady Shehata	Affiliated Associate Professor of Natural Language Processing
Dr. Min Xu	Affiliated Associate Professor of Computer Vision

MOHAMED BIN ZAYED
UNIVERSITY OF
ARTIFICIAL INTELLIGENCE



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