

Thesis

AI 901

Master of Science in Artificial intelligence

Prepared by Dr. Khaled Eskaf

Lecture :Intro





1-Khaled Eskaf: Assistant Professor of Intelligent System.

2-Ph.D. in Computer Science from the University of Salford in the UK.

▪ **Academic Experience:**

3-held several academic positions in Middle East, UK, and Canada.

4-served as assistant professor, department head of the Faculty of Computing and Information Technology at several universities.

▪ **Research Focus:**

5-Researcher in AI, machine learning (ML), deep learning (DL), and robotics

6-Applies intelligent systems in medical fields and climate change

• **Work Experience:**

7- Over 20 years of experience in education at universities and colleges.

8- working in MILA as mentor for graduate students in Canada, and teaching computer science courses and robotics.

9- International Expert Judge for robotics competitions, First Robotics-Canada and MakesX Mbot Robotics competition.

Course Description

The Thesis course is designed to provide students with an opportunity to apply their knowledge and skills in the domain of Artificial Intelligence to solve real-world problems or conduct innovative research in the field. This course encourages students to demonstrate their proficiency in Artificial Intelligence concepts, methodologies, and techniques while fostering creativity, critical thinking.

The course necessitates the completion of core AI courses, including topics such as machine learning, deep learning, and algorithms, in addition to familiarity with programming languages commonly used in AI, such as Python or R language.

- ☐ Thesis course focuses on applying AI knowledge to real-world problems or innovative research.
- ☐ Encourages creativity, critical thinking, and problem-solving.
- ☐ Requires completion of core AI courses (machine learning, deep learning, algorithms).
- ☐ Proficiency in programming languages such as Python or R is essential.
- ☐ Students demonstrate expertise in AI methodologies and techniques.

Learning Outcomes

- ☐ Apply foundational AI concepts (machine learning, deep learning, NLP, computer vision) to solve problems or research questions.
- ☐ Design and implement AI projects, considering data acquisition, model training, evaluation, and deployment.
- ☐ Explore cutting-edge research topics or propose novel AI solutions, conducting literature reviews and identifying research gaps.
- ☐ Collaborate effectively in teams, communicating goals, progress, and results through documentation, presentations, and demonstrations.

- Project Proposal:** Students will create a detailed project proposal, outlining the problem, objectives, methodology, and expected results. This proposal will be reviewed and approved by the instructor.
- Project Development:** Students will bring their proposal to life, using industry-standard AI tools and frameworks. They will handle data collection, model design, training, and experimentation, refining their solution based on feedback.
- Progress Documentation:** Throughout the project, students will keep track of their progress, documenting challenges, solutions, and key insights. Regular check-ins with the instructor will ensure ongoing support and feedback.
- Final Report:** At the end of the course, students will submit a thorough report that covers the project's problem, methods, experiments, results, and analysis, including a reflection on its strengths, limitations, and potential future improvements.
- Presentation and Demo:** Students will showcase their work through a formal presentation and live demonstration of their AI solution, highlighting the impact of their project and addressing feedback from faculty and peers.

Project Submission System

Team Formation:

- Teams can consist of 2 to 3 students.
- The supervisor will approve teams within 3 days after the course begins.

Proposal Submission:

- Each team must submit a project proposal, including a time plan, within the first three weeks of the semester.

Proposal Registration:

- In the fourth week, a seminar will be held where teams present their proposals for approval.
- Proposals must receive at least 75% approval from the seminar committee. Teams with less than 75% can make improvements and resubmit within one week for supervisor approval.
- Projects not registered by the fifth week after the seminar will not be accepted for graduation.

Attendance Requirement:

- Students must attend at least 70% of the weekly project meetings scheduled throughout the semester.

Report Submission:

- The final report is due by the end of the eleventh week and should be submitted to the supervisor.

Project Discussion and Evaluation:

- Projects will be reviewed by a faculty committee at the end of the semester and evaluated based on:
 - Clarity and quality of the proposal (10%)
 - AI solution implementation and functionality (20%)
 - Experimental rigor and depth (10%)
 - Quality and organization of the final report (20%)
 - Presentation and demonstration effectiveness (20%)
 - Team collaboration (if applicable) (10%)
 - Adherence to timelines and milestones (10%)

General Report Guidelines

The research report should include the following sections:

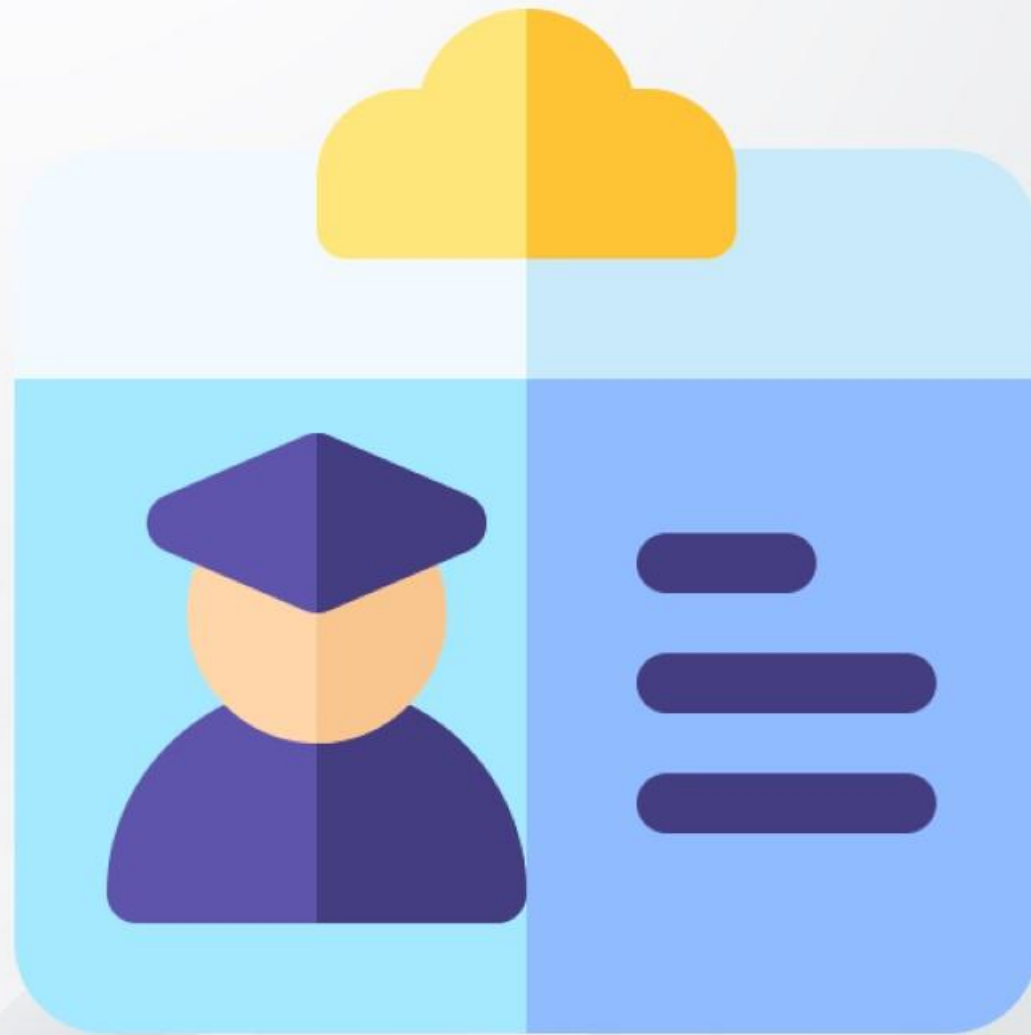
- Research Title
- Introduction
- Problem Statement
- Importance of Study
- Study Objectives
- Study Questions
- Theoretical Background
- Literature Review
- Methodology and Tools
- Proposed Approach/Solution
- Solution Design
- Solution Implementation
- Case Study
- Results Discussion and Evaluation
- Future Work
- References List

Project Timeline and Milestones

- Weeks 1 and 2: Propose the research topic and form teams.
- Week 3: Draft and finalize the project proposal.
- Weeks 4 and 5: Conduct the survey.
- Weeks 6 to 8: Project implementation.
- Weeks 9 and 10: Prepare the final report and deliver the presentation.

Student Progress Table

	Week	Task	Progress (Yes/No)	Comments
1	Week 1	Research topic proposal and team formation		
2	Week 2	Research topic proposal and team formation		
3	Week 3	Proposal submission and approval		
4	Week 4	Survey preparation and conduct		
5	Week 5	Survey preparation and conduct		
6	Week 6	Project implementation		
7	Week 7	Project implementation		
8	Week 8	Project implementation		
9	Week 9	Final report preparation and presentation development		
10	Week 10	Final report preparation and presentation development		



Google Cloud for Researchers



**Accelerate Research
with Google Cloud**

Google Cloud for Researchers

- Make tomorrow's research breakthroughs possible.
- Accelerate your research with free credits, training, and cloud tools from Google.

What is it?

- Google Cloud for Researchers is a support program offering:
 - - Free Google Cloud credits
 - - Technical training
 - - Research infrastructure tools
- For graduate students, PhDs, and faculty in fields like:
 - • AI / Machine Learning
 - • Data Science
 - • Bioinformatics
 - • Engineering

Main Features

-  Free Cloud Credits (up to \$50,000)
-  Tools like Vertex AI, BigQuery, Cloud Storage
-  Training resources & hands-on support
-  High-performance TPUs & GPUs
-  Scalable cloud-based infrastructure

Who Can Apply?

- - Graduate students (MSc/PhD)
- - Academic researchers & faculty
- - Must belong to a non-profit, accredited university
- - Must have a valid university email
- - Must have a clear research project

How to Apply

- 1. Visit: cloud.google.com/edu/researchers
- 2. Click 'Apply for research credits'
- 3. Fill in the application:
 - - Project description
 - - Google Cloud tools you plan to use
 - - Timeline & expected outcomes
 - - Budget estimation

Why Should You Apply?

-  Save cloud infrastructure costs
-  Accelerate your research timeline
-  Enhance your publication impact
-  Get recognition for Google-funded research
-  Join a global network of cloud researchers
- Good contribution for MidOcean University



Thank You