Republic of the Philippines
BATANGAS STATE UNIVERSITY
BatStateU Alangilan
Alangilan, Batangas City
College of Engineering, Architecture and Fine Arts
https://batstate-u.edu.ph, Tel. No. (043) 425-0139 loc. 0118/2121

CURRICULUM
Master of Science in Artificial Intelligence (MSAI)

Academic Year 2021-2022
Reference CMOs: 15 Series of 2019: Policies, Standards and Guidelines for Graduate Programs

Curriculum Description

Master of Science in Artificial Intelligence (MSAI) aims to produce exceptional leaders in the AI industry who create and deploy cutting-edge intelligent systems which amplify human capabilities. The program exposes students on various advanced AI concepts, theories, models and frameworks on data science, robotics and machine learning. The program includes 9 credits of core courses, 9 credits of specialization courses, 6 credits of elective courses, and 6 credits of thesis. The program will adopt outcome-based education (OBE) framework with flipped classroom and other blended learning pedagogies.

Program Educational Objectives of Artificial Intelligence (PEO)

The MS Artificial Intelligence alumni three to five years after graduation shall:

1. **Specialist.** Practiced as a high-level specialist in solving complex artificial intelligence problems leading to improvements and innovations, while taking into consideration the environmental, social, and economical requirements.

2. **Professionalism and Leadership.** Assumed leadership position in industry, academe, government, or private sector with consideration to social and ethical responsibility.

3. **Lifelong Learning.** Engaged in lifelong learning through further studies, research, certifications, promotions, and other personal and professional development activities.

Institutional Graduate Attributes (IGA)

The student should achieve at least 75% for each IGA upon graduation

1. **Knowledge Competence.** Demonstrate a mastery of the fundamental knowledge and skills required for functioning effectively as a professional in the discipline, and an ability to integrate and apply them effectively to practice in the workplace.

2. **Creativity and Innovation.** Experiment with new approaches, challenge existing knowledge boundaries and design novel solutions to solve problems.

3. **Critical and Systems Thinking.** Identify, define, and deal with complex artificial intelligence problems pertinent to the future professional practice or daily life through logical, analytical and critical thinking.

4. **Communication.** Communicate effectively (both orally and in writing) with a wide range of audiences, across a range of professional and personal contexts, in English and Pilipino.

5. **Lifelong Learning.** Identify own learning needs for professional or personal development; demonstrate an eagerness to take up opportunities for learning new things as well as the ability to learn effectively on their own.

6. **Leadership, teamwork, and Interpersonal Skills.** Function effectively both as a leader and as a member of a team; motivate and lead a team to work towards goal; work collaboratively with other team members; as well as connect and interact socially and effectively with diverse culture.

7. **Global Outlook.** Demonstrate an awareness and understanding of global issues and willingness to work, interact effectively and show sensitivity to cultural diversity.

8. **Social and National Responsibility.** Demonstrate an awareness of their social and national responsibility; engage in activities that contribute to the betterment of the society; and behave ethically and responsibly in social, professional and work environments.

Students Outcomes

The following skills, knowledge, and behaviors are expected to be attained by the students as they progress through the program:

1. **Knowledge Competence.** Demonstrate a comprehensive and broad understanding of artificial intelligence principles and apply advanced knowledge in the specific engineering discipline;

2. **Critical and System Thinking.** Analyze, synthesize, create and evaluate the challenges in artificial intelligence practice;

3. **Design and Analysis.** Design components, devices, and systems to meet specified engineering needs under real–world constraints;

4. **Communication.** Communicate effectively the technical knowledge, both orally and in writing, on complex artificial intelligence activities;

5. **Leadership and Teamwork.** Function effectively as an individual, a team member, or as a leader in diverse work environments;

6. **Creativity and Innovation.** Contribute to the generation, dissemination and preservation of knowledge, methodologies, techniques, and processes;

7. **Lifelong Learning.** Engage in continuous professional development and lifelong learning endeavors;

8. **Ethics and Professionalism.** Conduct oneself within professional and ethical standards; and

9. **Research.** Perform independent scientific research that results in innovation with application.

CURRICULUM COMPONENTS

A. CORE COURSES (9 units)		
Course Code	**Course Title**	**Credit Unit**
MSAI 501	Foundations of Artificial Intelligence	3
GECE 501	Linear Systems Theory	3
MSRM 501	Research Methodology	3
B. SPECIALIZATION COURSES (9 units)		
Course Code	**Course Title**	**Credit Unit**
MSDS 504	Machine Learning and Neural Networks	3
GECE 532	Signals, Systems and Control	3
MSAI 505	Seminars in Artificial Intelligence	3
C. THESIS COURSES (6 units)		
Course Code	**Course Title**	**Credit Unit**
MSAI 520	AI Thesis 1	3
MSAI 521	AI Thesis 2	3
D. ELECTIVE COURSES (6 units)		
Course Code	**Course Title**	**Credit Unit**
MSAI 506	Computer Vision	3
MSAI 507	Advanced Human Computer Interaction	3
MSAI 508	Natural Language Processing	3
MSAI 509	Information Retrieval	3
MSAI 510	Data Mining	3
MSAI 511	Unsupervised Machine Learning	3
MSAI 512	Deep Learning	3
MSAI 513	Robotics Science and Systems	3
MSAI 514	Mobile Robots	3
MSAI 515	Robotics Sensing and Navigation	3
MSAI 516	Advanced Programming Language	3
MSAI 517	Advanced Design and Analysis of Algorithms	3