Republic of the Philippines
BATANGAS STATE UNIVERSITY
BatStateU Alangilan
Alangilan, Batangas City
College of Engineering, Architecture and Fine Arts
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CURRICULUM
Master of Science in Earthquake Engineering (MSEaE)

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

Curriculum Description

The Master of Science in Earthquake Engineering trains specialists in the areas of geophysical and earthquake engineering who are capable of evaluating, predicting, and reducing the risk of earthquakes. It covers structural, geotechnical, and seismological aspects of earthquakes, and focuses on providing students with the tools they need to quantify seismic hazards. The program will prepare students to conduct extensive engineering analysis in relation to ground movements associated with seismic activities. It will provide evaluation and assessment regarding the findings based on the post-earthquake development which will be done vis-a-vis mathematical modelling and software as provided for by seismic recording instruments and similar technologies. The same will be introduced and incorporated into the structural evaluations and designs of common low and high rise structures together with the impact on the natural earth landscape. Lectures, problem case analysis and solution, and applications in structural designs are the expected activities to be carried out in each subject.

Program Educational Objectives of Earthquake Engineering (PEO)

The MS Earthquake Engineering alumni three to five years after graduation shall:

1. **Specialist.** Practiced as a high-level in solving complex earthquake engineering 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 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 earthquake engineering principles and apply advanced knowledge in the specific engineering discipline;

2. **Critical and System Thinking.** Analyze, synthesize, create and evaluate the challenges in earthquake engineering 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 earthquake engineering 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**
ENGG 501	Computational Mathematics 1	3
ENGG 502	Computational Mathematics 2	3
ENGG 503	Design of Experiments and Data Analytics	3
B. SPECIALIZATION COURSES (9 units)		
Course Code	**Course Title**	**Credit Unit**
MSEaE 501	Dynamics of Structures	3
MSEaE 502	Earthquake and Tsunami Disaster Reduction	3
MSEaE 503	Passive Control of Structure against Earthquakes	3
C. THESIS COURSES (6 units)		
Course Code	**Course Title**	**Credit Unit**
MSEaE 507	Thesis I	3
MSEaE 508	Thesis II	3
D. ELECTIVE COURSES (6 units)		
Course Code	**Course Title**	**Credit Unit**
MSEaEE 501	Strong Motion Prediction	3
MSEaEE 502	Earthquake Resistant Limit State Design for Building Structures	3
MSEaEE 503	Geotechnical Earthquake Engineering	3