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
Doctor of Philosophy in Engineering Education (PhDEEd)

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

Curriculum Description

The 21st century engineering practices are being shaped by a wide range of divergent global factors brought about by the volatile, uncertain, complex, and ambiguous world. To respond to the needs of 21st century engineering jobs, it is incumbent upon higher learning institutions to transform engineering education into outcomes-based to prepare students for the grand challenges ahead. The program will prepare students to conduct extensive engineering education research, where results can be translated into classroom practice. It will also provide a thorough introduction to concepts, theories, models, frameworks and pedagogies that are central to learning. Graduates of this program are in academic, industrial, and government sectors. Job functions include research, teaching, corporate training, higher education administration, outreach, public service, and educational policy. The program includes core, specialization, and elective courses, and dissertation research. The program will adopt outcome-based education (OBE) framework with flipped classroom and other blended learning pedagogies.

Program Educational Objectives of Engineering Education (PEO)

The Ph.D Engineering Education alumni three to five years after graduation shall:

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

2. **Professionalism and Leadership.** Assumed high level 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 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.** Systematically create and synthesize knowledge;

2. **Critical and System Thinking.** Demonstrate critical, creative, and reflective thinking;

3. **Communication.** Master effective oral and written skills;

4. **Innovation.** Implement innovative teaching and learning pedagogies appropriate for engineering students learning needs;

5. **Tools Usage.** Demonstrate skills in the use of technology in improving engineering education delivery;

6. **Commitment.** Apply principles of engineering education to solve instructional or curricular issues for a specific engineering program;

7. **Lifelong Learning.** Exemplify continuing professional education in a specific engineering discipline and actively participate in professional engineering activities;

8. **Policy Awareness.** Be updated on and critique engineering educational policies and programs; and

9. **Research Savvy.** Perform independent scientific research that results in creation of new knowledge in engineering education.

CURRICULUM COMPONENTS

A. CORE COURSES (12 units)		
Course Code	**Course Title**	**Credit Unit**
DPEE 501	Foundations of Engineering Education	3
DPEE 502	Research Methodology in Engineering Education	3
DPEE 503	Theories of Development and Engineering Thinking	3
DPEE 504	Educational Methods in Engineering Education	3
B. SPECIALIZATION COURSES (9 units)		
Course Code	**Course Title**	**Credit Unit**
DPEE 505	Developing an Engineering Education Curriculum	3
DPEE 506	Engineering Education Practicum I	3
DPEE 507	Engineering Education Practicum II	3
C. DISSERTATION COURSES (12 units)		
Course Code	**Course Title**	**Credit Unit**
DPEE 508	Dissertation Research I	6
DPEE 509	Dissertation Research II	6
D. ELECTIVE COURSES (9 units)		
Course Code	**Course Title**	**Credit Unit**
DPEEE 501	Finance and Grant Writing	3
DPEEE 502	The CDIO Framework for Engineering Education	3
DPEEE 503	Globalization and Engineering	3
DPEEE 504	Content, Pedagogy, and Assessment in Engineering Education	3
DPEEE 505	Leadership, Policy and Change in STEM Education	3
DPEEE 506	Independent Study	3