



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 Transportation Systems Engineering (MSTE)**

Academic Year 2021-2022

Reference CMOs: 15 Series of 2019: Policies, Standards and Guidelines for Graduate Programs

### **Curriculum Description**

With increasing demand for mobility and rapid urbanization, the transportation system binds a region's physical, economic and social structure. The Master of Science in Transportation Engineering program provides a strong foundation in traffic engineering, transportation planning, transportation economics, public transportation systems and intelligent transportation systems. This program is based on the premise that a common set of analytical approaches and methodologies can be applied to solve a range of transportation challenges. Students must complete a program of coursework, plus a research-based master's thesis on a topic of their choosing approved by their thesis supervisor. Coursework includes required core courses, specialization courses and research courses.

### **Program Educational Objectives (PEO)**

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

1. **Specialist.** Practiced as a high-level in solving complex transportation 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 transportation engineering principles and apply advanced knowledge in the specific engineering discipline;
2. **Critical and System Thinking.** Analyze, synthesize, create and evaluate the challenges in transportation 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 transportation 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           |
| MSRM 501                            | Research Methodology                             | 3           |
| B. SPECIALIZATION COURSES (9 units) |  |             |
| Course Code                         | Course Title                                     | Credit Unit |
| MSTE 501                            | Traffic Flow Theory and Analysis                 | 3           |
| MSTE 502                            | Transportation Systems Analysis and Planning     | 3           |
| MSTE 504                            | Planning and Design of Transportation Facilities | 3           |
| C. THESIS COURSES (6 units)         |  |             |
| Course Code                         | Course Title                                     | Credit Unit |
| MSTE 522                            | Thesis I: Thesis Proposal                        | 3           |
| MSTE 523                            | Thesis II: Thesis Presentation                   | 3           |
| D. ELECTIVE COURSES (6 units)       |  |             |
| Course Code                         | Course Title                                     | Credit Unit |
| MSTEE 501                           | Transportation Economics and Evaluation          | 3           |
| MSTEE 502                           | Pavement Systems Engineering                     | 3           |
| MSTEE 503                           | Airport Engineering                              | 3           |
| MSTEE 504                           | Ports and Harbor Engineering                     | 3           |
| MSTEE 505                           | Railway Engineering                              | 3           |
| MSTEE 506                           | Bridge Engineering                               | 3           |
| MSTEE 507                           | Special Topics                                   | 3           |