Technological University of the Philippines – Manila

**College:** ##college

**Program:** ##program

**TUP Mission**

The Technological University of the Philippines shall [a] provide higher and advanced vocational, technical, industrial, technological, and professional education and training in industries and technology and in practical arts leading to applied research, certificates, diplomas and degrees. It shall [b] provide progressive leadership in developmental studies in technical, industrial and technological fields and production using indigenous materials, [c] effect technology transfer in the countryside; and [d] assist in the development of small and medium scale industries in identified growth-centers.

**TUP Vision**

The Technological University of the Philippines shall be the premier state university with recognized excellence in engineering and technology education at par with the leading universities in the ASEAN Region.

**Institutional Learning Outcomes**

T- transparency and participatory governance

U- unity and cooperation in the pursuit of tup mission, goals and objectives

P- professionalism in the discharge

I- integrity and consistent commitment to maintain the good name of the University

A-accountability for individual and organizational quality performance

N- nationalism through tangible contribution to the rapid economic growth of the country

S- shared responsibility, hard work, and resourcefulness in compliance to the national mandates

**Program Educational Objectives**

# After 3-5 years of graduation, the graduates of the program are expected to:

1. Achieve a high level of technical expertise to succeed in electronics engineering profession
2. Engage in lifelong learning actively such as progressive leadership in applied research, development studies in technical, industrial and engineering fields and production.
3. Engage in electronics engineering professional services to effect technology transfer and assist in the development of small and medium scale industries to contribute to national development.

**Program Description**

The Bachelor of Science in Electronics Engineering (BSECE) is an interdisciplinary, industry-oriented, more practical and conceptualized to meet the country’s need for competent electronics engineers in education and industry that integrates available emerging technologies with knowledge of mathematics, natural, social and applied sciences to design and implement new, improved or innovate electronics, computer and communication systems, devices, goods, services and processes. In consonance with the field of the Electronics Engineering Profession stipulated in Section 5, article 1 of the RA 9292 also known as Electronics Engineering Law.

**Program Learning Outcomes**

| (a) | An ability to apply knowledge of mathematics and science to solve engineering problem |
| --- | --- |
| (b) | An ability to design and conduct experiments, as well as to analyze and interpret data |
| (c) | An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability, in accordance with standards |
| (d) | An ability to function on multi-disciplinary teams |
| (e) | An ability to identify, formulate, and solve engineering problems |
| (f) | An ability to apply professional and ethical responsibility |
| (g) | An ability to communicate effectively |
| (h) | An ability to identify the impact of engineering solutions in a global, economic, environmental and societal context |
| (i) | An ability to recognize the need for, and an ability to engage in lifelong learning |
| (j) | An ability to apply knowledge of contemporary issues |
| (k) | An ability to use techniques, skills, and modern engineering tools necessary for engineering practice |
| (l) | An ability to apply knowledge of engineering management principles as a member and leader in a team, to manage projects and in multidisciplinary environments |
| (m) | An ability to understand at least one specialized field of Electronics Engineering practice |

**Key Courses for the Assessment of PLO Attainment**

| Program Learning Outcomes | Key Performance Indicators (Observable in the Classroom) | Introductory | | Enabling | | Demonstrative | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Key Courses  (Code and title) | Year level and Semester | Key Courses  (Code and title) | Year level and Semester | Key Courses  (Code and title) | Year level and Semester |
| (a) An ability to apply knowledge of mathematics and science to solve engineering problems. | 1. Use mathematical principles to solve engineering problems accurately.  2. Evaluate and assess the effectiveness of mathematical approaches in problem-solving.  3. Devise new problem-solving methodologies integrating math and science concepts.  4. Elaborate on the application of mathematical and scientific theories in solving engineering problems. | MATHENG1-Differential Calculus | 1st Year/1st Sem | PECEM-Advanced Engineering Mathematics for ECE (lec) | 2nd Year/2nd Sem | PECEC1-B-Signals, Spectra and Signal Processing (lec) | 3rd Year/1st Sem |
| (b) An ability to design and conduct experiments, as well as to analyze and interpret data. | 1. Construct experiments aligning with scientific principles and engineering objectives.  2. Assess data collected during experiments for patterns and correlations.  3. Explain and derive conclusions from experiment data analysis.  4. Communicate experiment findings effectively using visual aids and reports. | PECEP1L- Fundamentals of ECE | 1st Year/1st Sem | PECEE1L- Electronics 1: Electronics Devices and Circuits (lab) | 2nd Year/1st Sem | PECEE3L-Electronics 3:Electronic Systems and Design (lab) | 3rd Year/1st Sem |
| (c) An ability to design a system, component, or process to meet desired needs within realistic constraints, in accordance with standards. | 1. Utilize engineering principles to design systems considering various constraints.  2. Assess the efficiency and functionality of designed systems within constraints.  3. Devise innovative components considering multiple constraints.  4. Validate design choices by linking them to specified constraints and standards. | PECEE2L-Electronics 2: Electronic Circuits Analysis & Design (lab) | 2nd Year/2nd Sem | PECEC3L-Communications 3: Data communications (lab) | 3rd Year/2nd Sem | TECEE2L- ECE Elective 2 (lab) | 4th Year/2nd Sem |
| (d) An ability to function on multi-disciplinary teams. | 1. Work effectively within diverse teams to achieve common goals.  2. Assess individual and team contributions within multidisciplinary projects.  3. Generate strategies to foster effective collaboration among diverse team members.  4. Mediate and resolve conflicts, promoting consensus among team members. | PECEG2- Methods of Research | 3rd Year/2nd Sem | PECED1L- Design 1/Capstone 1 | 4th Year/1st Sem | PECED2L- Design 2/Capstone 2 | 4th Year/2nd Sem |
| (e) An ability to identify, formulate, and solve engineering problems | 1. Recognize and classify engineering problems within given scenarios.  2. Break down problems into manageable components for resolution.  3. Develop and apply solutions to engineering problems efficiently.  4. Assess the effectiveness of problem-solving approaches used. | PECEE1B- Electromagnetics | 2ndYear/2nd Sem | PECEC1- Communications 1: Principles of Communications (lec) | 2nd Year/1st Sem | PECEE6- Feedback and Control Systems (lec) | 3rd Year/2nd Sem |
| (f) An ability to apply professional and ethical responsibility. | 1. Follow professional codes of conduct and ethical guidelines.  2. Assess ethical dilemmas in engineering contexts for appropriate action.  3. Clearly communicate ethical considerations within engineering practice.  4. Reflect on personal ethical decisions made in professional settings. | GEC8- Ethics | 1st Year/1st Sem | PECEG1- ECE Laws, Contracts, Ethics, Standards & Safety | 2nd Year/1st Sem | BES3- Technopreneurship 101 | 3rd Year/2ndSem |
| (g) An ability to communicate effectively. | 1. Articulate engineering concepts effectively through various mediums.  2. Assess the effectiveness of communication in different contexts.  3. Engage in constructive discussions to convey complex engineering ideas.  4. Deliver clear and concise presentations to diverse audiences. | GEE12D- The Entrepreneurial Mind | 4th Year 2nd Sem | BES4- Engineering Management | 2nd Year/2nd Sem | TQM- Total Quality Management | 4th Year/1st Sem |
| (h) An ability to identify the impact of engineering solutions in a global, economic, environmental, and societal context: | 1. Evaluate the global impact of engineering solutions on economies and societies.  2. Assess environmental implications of engineering solutions.  3. Forecast the economic consequences of implementing specific engineering solutions.  4. Engage in discussions about societal implications of engineering interventions. | BES2- Engineering Economics | 2nd Year/1st Sem | ACECE7- Environmental Science and Engineering | 4th Year/1st Sem | PECED2L- Design 2/Capstone 2 | 4th Year/2ndSem |
| (i) An ability to recognize the need for, and an ability to engage in lifelong learning: | 1. Reflect on personal learning needs and areas for improvement.  2. Develop learning plans to acquire new skills or knowledge in engineering.  3. Actively seek and explore resources for continuous learning in the field.  4. Implement new knowledge or skills acquired through continuous learning. | GEE11D- Living in IT Era | 4th Year/1st Sem | SIT- Supervised Industrial Training | 3rd Year/Summer | PECEG3F-Seminars/Colloquium | 4thYear/2ndSem |
| (j) An ability to apply knowledge of contemporary issues. | 1. Utilize current engineering trends and advancements in practice.  2. Assess the relevance of contemporary issues in engineering contexts.  3. Incorporate contemporary knowledge into engineering solutions.  4. Engage in discussions about the impact of contemporary issues on engineering practice. | GEC7- Science, Technology and Society | 1st Year/1st Sem | GEC4- Mathematics in the Modern World | 2nd Year/2nd Sem | TEECE1- ECE Elective 1(lec) | 4th Year/1st Sem |
| (k) An ability to use techniques, skills, and modern engineering tools  necessary for engineering practice. | 1. Utilize engineering tools and software proficiently in various tasks.  2. Evaluate the effectiveness of different engineering tools in specific contexts.  3. Integrate modern engineering techniques into problem-solving approaches.  4. Demonstrate proficiency in operating specialized engineering equipment/tools. | MATHENG3L- Engineering Data Analysis (lab) | 1st Year/1st Sem | ACECE5L- Computer Programming 2 | 2nd Year/1st Sem | PECEE5L-Digital Electronics 2: Microprocessor and Microcontroller Systems (lab) | 3rd Year/2nd Sem |
| (l) An ability to apply knowledge of engineering management principles as a member and leader in a team, to manage projects and in multidisciplinary environments: | 1. Apply project management techniques within multidisciplinary teams.  2. Assess project management strategies for effectiveness in achieving goals.  3. Assume leadership roles and effectively manage multidisciplinary teams.  4. Engage in collaborative project management within diverse team environments. | BES4-Engineering Management | 2nd Year/2nd Sem | TQM-Total Quality Management | 4th Year/1st Sem | PECED2L-Design 2/Capstone 2 | 4th Year/2nd Sem |
| (m) An ability to understand at least one specialized field of Electronics Engineering practice. | 1. Analyze specialized areas within Electronics Engineering practice.  2. Evaluate the effectiveness and relevance of specialized practices.  3. Integrate specialized knowledge into broader electronics engineering concepts. | PECEP2- fundamentals of ICT | 1st Year/2nd Sem | TEECE1- ECE Elective 1 (lec) | 4th Year/1st Sem | TEECE2- ECE Elective 2 (lec) | 4th Year/2nd Sem |

**Attainment of PLOs**

**Level: 60%**

| PLO | Course Code - Course Title | Assessment used to measure if PLO is attained \* | Tools used in scoring student’s outputs\*\* | Total number of Enrolled students | Total number of students who passed the assessment tool used to measure PLO | Total number of students who passed the Course |
| --- | --- | --- | --- | --- | --- | --- |
| ##plo-1 | ##course-title-1 | ##assessment-tool-1 | ##tools-used-1 | ##students-1 | ##tool-passed-1 | ##course-passed-1 |
| ##plo-2 | ##course-title-2 | ##assessment-tool-2 | ##tools-used-2 | ##students-2 | ##tool-passed-2 | ##course-passed-2 |
| ##plo-3 | ##course-title-3 | ##assessment-tool-3 | ##tools-used-3 | ##students-3 | ##tool-passed-3 | ##course-passed-3 |
| ##plo-4 | ##course-title-4 | ##assessment-tool-4 | ##tools-used-4 | ##students-4 | ##tool-passed-4 | ##course-passed-4 |
| ##plo-5 | ##course-title-5 | ##assessment-tool-5 | ##tools-used-5 | ##students-5 | ##tool-passed-5 | ##course-passed-5 |
| ##plo-6 | ##course-title-6 | ##assessment-tool-6 | ##tools-used-6 | ##students-6 | ##tool-passed-6 | ##course-passed-6 |
| ##plo-7 | ##course-title-7 | ##assessment-tool-7 | ##tools-used-7 | ##students-7 | ##tool-passed-7 | ##course-passed-7 |
| ##plo-8 | ##course-title-8 | ##assessment-tool-8 | ##tools-used-8 | ##students-8 | ##tool-passed-8 | ##course-passed-8 |
| ##plo-9 | ##course-title-9 | ##assessment-tool-9 | ##tools-used-9 | ##students-9 | ##tool-passed-9 | ##course-passed-9 |

| Prepared by: | Checked by: | Noted by: |
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| ##prepared\_by | ##checked\_by | ##noted\_by |
| OBE -CQI College Coordinator | Department head | College dean |