Adama Science and Technology University (ASTU)

PEOs and SOs of CoEEC's Programs

CoEEC ADAA

June, 2025

Adama, Ethiopia

Adama Science and Technology University (ASTU)

Program Educational Objectives (PEOs) and Student Outcomes (SOs) of CoEEC Programs

June, 2024
Adama, Ethiopia

Contents

Vision, Missions, PEOs and SOs of CoEEC Programs

Vision

- ASTU aspires to be the first choice in Ethiopia and the premier center of excellence in applied science and technology in Africa by 2030.

Missions

- Produce ethical and internationally competent graduates in Electrical Engineering and Computing through quality education.
- Conduct problem solving research.
- Provide demand driven community service.
- Serve as center for innovative knowledge and technology transfer for various industries.

Academic Programs

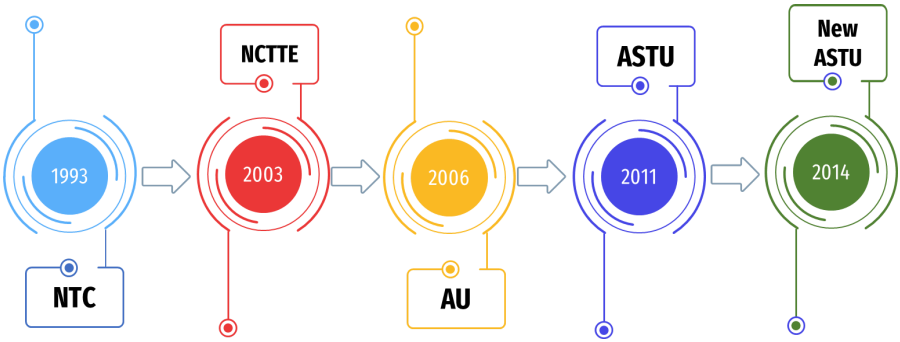
Adama Science and Technology University, ASTU, is one of the two science and technology universities established to contribute to the industrial development of Ethiopia by providing high-quality education and training in scientific and technological disciplines. The university's focus on research oriented science and technology education is a key part of its strategy to produce qualified and competent professionals for the nation's industrial and economic progress. ASTU has put in place seventeen undergraduate country's need based academic programs based on the Korean Science and Technology University experiences. These programs were developed with well-defined objectives and outcomes, have a distinct character of flexibility, being futuristic, integrally linked to research and Center of Excellence's.

Program Educational Objectives (PEOs)

PEOs are broad statements that describe what graduates are expected to attain within 3-5 years after graduation. It emphasizes expertise, engagement, learning, leadership and teamwork.

Student Outcomes (SOs)

SOs describes what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviors that students acquire as they progress through the program. The detail list of the Program Educational Objectives (PEOs) and Student Outcomes (SOs) for each program at College of Electrical Engineering and Computing (CoEEC) are presented in the next subsection.



1. Computer Science and Engineering (CSE)

1.1. Program Educational Objectives (PEO's)

- **PEO-1:** Be employed as computer science or computer engineering professionals demonstrating optimal professional competency or be able to pursue further graduate educational opportunities.
- **PEO-2:** Demonstrate peer-recognized expertise together with the ability to articulate that expertise as computer science or computer engineering professionals
- **PEO-3:** Acquire strong analytic, design, and implementation skills required to formulate and solve computer science or computer engineering problems in the IT industry or research environment to create innovative technological solutions.
- **PEO-4:** Demonstrate that they can operate, communicate, collaborate, work in a team and adjust themselves for a lifelong learning and multidisciplinary research approach as ethically and socially responsible computer science or computer engineering professionals.

1.2. Student Outcome's (SO's)

- **SO-1:** Ability to identify, formulate, analyze, and solve complex computing or engineering problems by applying principles of computing, engineering, science, and mathematics.
- **SO-2:** Ability to design, implement, and evaluate a computing or engineering solution to meet a given set of requirements, with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- **SO-3:** Ability to apply computer science theory and software development fundamentals to produce computing-based solutions.
- **SO-4:** Ability to develop and conduct appropriate experimentation analyze and interpret data and use engineering judgment to draw conclusions.
- **SO-5:** Ability to communicate effectively with the computing and engineering community about complex computing and engineering activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.
- **SO-6:** Ability to recognize ethical and professional responsibilities and make informed judgments in engineering and computing practice based on legal and ethical principles, considering the impact of solutions in global, economic, environmental, and societal contexts.
- **SO-7:** Ability to function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline, creating a collaborative and inclusive environment, establishing goals, planning tasks, and meeting objectives.
- **SO-8:** Ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

2. Electronics and Communication Engineering(ECE)

2.1. Program Educational Objectives (PEO's)

- **PEO-1:** To provide graduates with a strong foundation in mathematics, science and engineering fundamentals to enable them to devise and deliver efficient solutions to challenging problems in Electronics &Communications Engineering.
- **PEO-2:** To produce ethically competent and technically qualified Electronics and Communication Engineers with the potential to become leaders in Industries and Companies associated with Electronics and Communication Engineering, and able to pursue research or have successful career in Academia.
- **PEO-3:** To produce Electronics and Communication Engineers who are committed to sustainable development of Electronics and Communication Systems Companies and Industries for the betterment of society and nation.
- **PEO-4:** To prepare graduates that can critically analyze existing literature in an area of specialization and ethically develop innovative and re- search-oriented methodologies to solve the problems identified to support the socio-economic development of the nation.

2.2. Student Outcome's (SO's)

- **SO-1:** An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- **SO-2:** An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- **SO-3:** An ability to communicate effectively with a range of audiences.
- **SO-4:** An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- **SO-5:** An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- **SO-6:** An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- **SO-7:** An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

3. Electrical Power and Control Engineering (EPCE)

3.1. Program Educational Objectives (PEO's)

- **PEO-1:** To provide graduates with a solid foundation in mathematical, scientific, and engineering fundamentals and depth and breadth studies in Electrical Power and Control Engineering, to comprehend, analyze, design, provide solutions for practical issues in Electrical Power and Control Engineering.
- **PEO-2:** To provide technical knowledge and skills to identify, comprehend, and solve complex tasks in industry and inspire the students to become future researchers/scientists with innovative ideas.
- **PEO-3:** To develop team-spirit and enterprising skills with effective communication and technical abilities to serve the society locally and internationally.
- **PEO-4:** To produce innovative engineers who can hold leadership responsibilities, establish their own enterprises and perform technology transfer for industries.

3.2. Student Outcome's (SO's)

- **SO-1:** An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- **SO-2:** An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- **SO-3:** An ability to communicate effectively with a range of audiences.
- **SO-4:** An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- **SO-5:** An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- **SO-6:** An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- **SO-7:** An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

4. Software Engineering (SE)

4.1. Program Educational Objectives (PEO's)

- **PEO-1:** Graduates will obtain general scientific and engineering knowledge, practical skills and general competences that make them confident to develop high-quality software solution in various application domain to meet the needs of industry and academia;
- **PEO-2:** Graduates will communicate effectively as SE professionals with users, peers and upper management ethically and proactively
- **PEO-3:** Graduates will demonstrate an understanding of the importance of life-long learning, professional development and pursue postgraduate studies and succeed in academic and research careers.
- **PEO-4:** Graduates will develop progressively managerial, reading, and influential roles in their work area and in the communities while solving community problems.

4.2. Student Outcome's (SO's)

- **SO-1:** Ability to identify, formulate, analyze, and solve complex computing or engineering problems by applying principles of computing, engineering, science, and mathematics.
- **SO-2:** An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- **SO-3:** An ability to communicate effectively with a range of audiences.
- **SO-4:** An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- **SO-5:** An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- **SO-6:** An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- **SO-7:** Cultivate the field of computing and its latest trends, to pursue teaching, research and development activities using appropriate learning strategies
- **SO-8:** An ability to use the techniques, skills, and modern engineering tools and processes necessary for software engineering practice to maintain legacy software systems and to develop new software systems.
- **SO-9:** An ability to apply software engineering perspective through soft- ware design and construction, requirements analysis, verification, and validation, to develop solutions to modern problems such as security, data science, and systems engineering that meets the automation needs of the society and industry.

Center of Excellences Aligned with CoEEC

ASTU has Eight CoE's, which are having different thematic and focus area. this are Space Technology Institute, Advanced Material science and Engineering, Transportation and Vehicle Engineering, Advanced Manufacturing Engineering, Electrical Systems and Electronics, Institute of Pharmaceutical Science, Urban Housing and Development and Water Resource & Irrigation Engineering.

The following table shows the mapping of CoE's with programs under College of Electrical Engineering and Computing.

No	CoEs	Academic Programs involved
1	Space Technology Institute	ECE, EPCE,CSE, CE, Geol, CE, Math, ME
2	Advanced Material Science and Engineering	MSE, Chem, CE, , Phys, Bio, ChmE, ECE, EPCE, CSE, Geol
3	Transportation and Vehicle Engineering	CE, MSE, ECE, EPCE, , Math, CSE, Geol
4	Advanced Manufacturing Engineering	MSE, ECE, EPCE,CSE,
5	Electrical systems and Electronics	CSE, ECE, EPCE, Math, Phys

PEOs and SOs of CoEEC's Programs

June, 2025

Adama, Ethiopia