

Vision and Mission Statements of Adeleke University (AU)

Vision Statement

The vision of the University is to excel in high quality teaching, research and innovative learning with capacity to compete globally.

Mission Statement

The mission of the University is to pursue and preserve truth, transmit and advance knowledge through high-quality general, professional and vocational education towards preparing people for dedicated service to humanity.

Vision and Mission Statements of the Faculty of Engineering (FOE)

Vision Statement

The vision of the Faculty is to prepare graduates in core and emerging Engineering practice, and instill lifelong learning for the development of inquisitive mind, team work, innovations and entrepreneurship.

Mission Statement

The mission of the Faculty is to:

1. provide broad-based foundation for creative and effective Engineering practice.
2. create an enabling environment for systematic training towards global competitiveness.
3. train with state-of-the-art laboratory and workshop facilities to produce graduates that will be self-reliant and relevant to the industry.
4. instill enduring character for positive contribution to the society.

Vision and Mission Statements of the Department of Civil Engineering (CVE)

Vision Statement

The vision of the Department is to be a national and international Centre of excellence in competitive training in Civil Engineering, providing opportunities to excel in theoretical knowledge and practical oriented thinking and research that will compete with others to solve most civil engineering related problems of the world.

Mission Statement

The mission of the Department is to ensure students have proper understanding of relevant subjects so as to:

- i. enable them make sound judgement of solutions when it comes to real world problem.
- ii. improve or contribute to existing knowledge
- iii. innovate and develop products
- iv. contribute to the betterment of the Engineering industries both locally and globally.

Program Educational Objectives (PEOs)

The Program Educational Objectives (PEOs) of the Civil Engineering program will lead to the production of:

PEO Ref No	PEO Title	PEO Details
PEO1	Preparation	Graduates who will be able to practice engineering in any of the application areas which include Structures, Highway, Geotechnics, water & Environmental as well as Public Health Engineering.
PEO 2	Core Competence	Graduates who will be able to be relevant in their chosen areas of specialization in the private and public sectors of the economy.
PEO 3	Invention, Innovation and Creativity	Graduates who will be able to contribute towards the expansion of the frontiers of engineering knowledge through creativity.
PEO 4	Career Development	Graduates who will be able to inculcate the habit of lifelong learning for career development through continuous intellectual

		and professional capacity development
PEO 5	Professionalism	Graduates who will be able to work in multi-disciplinary environment and strictly adhere to the ethics of their profession.

Programme Outcome (POs)

Table 3.1.1 presents the Program Outcome (POs) of the Civil Engineering programme which is designed to assure that the department graduates acquire the following;

Table 3.1.1 List of Program Outcome (POs)

PO Ref No	PO Title	PO Details
PO1	Engineering knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem analysis	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences
PO 3	Design/development of solutions	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 4	Conduct investigations of complex problems	Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and

		environmental considerations.
PO 5	Modern tool usage	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	The engineer and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	Environment and sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice
PO9	Individual and teamwork	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11	Life-long learning	Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
PO12	Life-long learning	Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
PO13	Enduring character	To instil enduring character for positive contribution to the society.

COURSE LEARNING OUTCOMES

The extent of attainment of Programme Outcomes (POs) by each student is measured through assessment of Course Learning Outcomes (CLOs) by mapping of POs to individual courses.

4.1 List of the Course Learning Outcomes

CVE 200: Introduction to Civil Engineering Course Learning Outcomes (as defined by the Programme)
1) Understanding of the various Civil Engineering career tracks upon graduation. (CLO1)
2) To be familiar with responsibilities and duties of professional sub-disciplines within Civil Engineering. (CLO2)
3) To be aware of the Civil Engineer responsibilities in solving local and global problems. (CLO3)
4) To improve technical and non-technical communications skills. (CLO4)
5) To understand the role of Civil Engineers in the society. (CLO5)

CVE 202: Structural Mechanics Course Learning Outcomes (as defined by the Programme)

1) Have an overview of what structural analysis is (CL0 1).
2) Compute shear forces and bending moments of the various types of determinate beams having different load types (CL0 2).
3) Analyze determinate structure using real work methods (CL0 3).
4) Understand bending stress in beams from the first principle and calculate the bending stresses in beams (CL0 4).
5) Find the deflection and rotation of statically determinate structures using the double integration method, moment area method/ Mohr theorems method, and Macaulay's method (CL0 5).
6) Introduction to statically indeterminate structures and estimate the degree of indeterminacy (CL0 6)
7) Carry out laboratory works on forces in equilibrium, beams, frames, trusses, and three-hinged arches (CL0 7)

CVE 321: Structural Analysis I Course Learning Outcomes (as defined by the Programme)
1) Have an overview of what determinate and indeterminate structures are? (CLO1)
2) Analyze indeterminate structures by energy and virtual work methods and all principal Objectives. (CLO2)
3) Analyze indeterminate structures using slope deflection and moment distribution methods(CLO3) .
4) Understand the principle of elastic instability.

CVE 301: Engineering Geology Course Learning Outcomes (as defined by the Programme)
1) Definition, scope and importance of engineering geology (CLO1)
2) Introduction to petrology, rocks and minerals (CLO2)
3) Classification of rocks (CLO3)

4) Engineering properties of rocks (CLO4)
5) Rock weathering, erosion and its effects on road and bridge construction (CLO 5)
6) Subsurface exploration, geological maps and field mapping technique (CLO 6)

CVE 352: Civil Engineering Material Course Learning Outcomes (as defined by the Programme)
1) Review properties of material; (CLO1)
2) Understand the properties of aggregate and water mixtures; (CLO2)
3) Know concrete mix; (CLO3)
4) Know the importance of water/cement ratio in concrete mix design; (CLO4)
5) Understand statistical methods in mix quality control; (CLO 5)
6) Know how to determine the strength of concrete; (CLO 6)
7) Know the uses of reinforced concrete; (CLO 7)
8) Conduct experiments to understand the properties of concrete; (CLO 8)

CVE 312: Engineering Surveying and photogrammetry II Course Learning Outcomes (as defined by the Programme)
1) Use photogrammetry for surveying (CLO1)
2) Use topographical survey in preparation of contour maps (CLO2)
3) Use contour maps (CLO3)
4) Compute areas and volumes of earthwork (CLO4)
5) Set out engineering works (CLO5)

CVE 322: Design of Structures I Course Learning Outcomes (as defined by the Programme)
1) Have fundamentals of the design processes (CLO 1)

2) Have background knowledge of construction material selection. (CLO 2)
3) Understand the building regulations and codes of practice (CLO 3)
4) Understand the philosophies/methods of design (CLO 4).
5) Design structural members (slab, beam, column, foundation, stair) to BS 8110 (CLO 5)
6) Work with individual structural plans and design their structural elements (CLO 6).
7) Carry out laboratory exercises by making use of civil engineering softwares: Beam max, AutoCAD and ORION (CLO 7)

CVE 302: Hydrology Course Learning Outcomes (as defined by the Programme)
1) Understand the fundamentals of pipe flow (CLO1)
2) Explain the reasons for the connection of pipes in series and parallel (CLO2)
3) Explain hydraulic efficiency (CLO3)
4) Understand sedimentation and bed load in water reservoir (CLO4)
5) Understand groundwater flow and Pumping (CLO5)
6) Analyzing of stream flow hydrograph (CLO6)
7) Explain groundwater hydrology (CLO7)

CVE 362: Hydraulics Course Learning Outcomes (as defined by the Programme)
1) understand hydrologic cycle and its components;
2) explain the constituents of the Atmosphere;
3) understand meteorology and obtaining meteorological data.
4) analyzing the data obtained using statistical methods

5) understand stream flow and its Measurement
6) evaluate data based on principles of mass, momentum and energy conservation;
7) explain the different devices for flow measurements
8) understand the type and capacity of pumps for engineering applications.

CVE 421: Design of Structures II Course Learning Outcomes (as defined by the Programme)
1) Understand the design criteria, BS 5950 design philosophy and behaviour of structural steel. (CLO1)
2) Analyse and design tension members, column (compression member), beams (flexural member) and plate girder (CLO2)
3) Able to analyse and design simple connections between structural members including pinned and welded connection (CLO3)
4) Analyse and design base plate (CLO4)
5) Design for limit of web buckling, web bearing and lateral torsional buckling (CLO5)
6) Design timber beam and column and determine the required size noting the effects of shear, notching, bending and deflection. (CLO6)
7) Design a flanged section in bending at the ultimate state and design a short and slender column at the ultimate state (CLO7)
8) Describe types of pre-stressed concrete, the factors that cause loss of pre-stressed force, Calculate the effects of slip, shrinkage and creep in pre-stressed concrete design and analysis and design pre-stressed beams with eccentric thrusts (CLO8)

CVE 441: Soil Mechanics II Course Learning Outcomes (as defined by the Programme)
1) Properties of soil and importance of soil to Civil Engineering. (CLO1)
2) Fundamentals of soil, classifications. (CLO2)
3) Measuring soil properties in the laboratory. (CLO3)
4) Interpreting and summarising the data; classifying soils. (CLO4)
5) Determining the optimum conditions for the compaction of soils and the ultimate amount achievable. (CLO5)

6) Estimating the settlement of soils due to compaction and consolidation. (CLO6)
7) Explain Permeability (Field and Laboratory Techniques). (CLO7)
8) Understand various stabilization technique. (CLO8)

CVE 431: Structural Analysis II Course Learning Outcomes (as defined by the Programme)
1) Analyse beams and rigid jointed frames using plastic method of analysis (kinematic theorem) (CLO 1)
2) Understand the concept of matrix method of analysis and direct stiffness method of analysis (CLO 2)
3) Analyse beams using direct stiffness of analysis (CLO 3)
4) Understand the concept of elastic instability of column, differentiate between buckling and crushing, Euler's column theory (CLO 4)
5) Derive the equations for the buckling/cripping load of long column based on the end conditions of column and compute the buckling load and stress using Euler's formula (CLO 5)
6) Understand the concept of yield line analysis and compute the moment and collapse load of simply supported one way spanning slab, continuous slab and two way spanning slab (CLO 6)
7) Understand finite element method (FEM) (CLO 7)
8) Carry out laboratory works (CLO 8)

CVE 461: Highway and Transportation Engineering Course Learning Outcomes (as defined by the Programme)
1) Determine the configuration of the earth's surface and the locations of natural and man-made objects and features (i.e. plot the contour map of a given area) for the purpose of determining a feasible and economic route location of highway; (CLO1)
2) Gather surveying data and carry out geometric designs such as road plans, vertical & horizontal alignments, curves and cross sections in order to blend the highway features harmoniously with the topography of site; (CLO2)

3) Set out all geometric elements of highway on the field; (CLO3)
4) Perform testing of highway materials for quality control and carry out remediation process where necessary; (CLO4)
5) Identify any mode of road failure and recommend suitable remedy; (CLO5)
6) Estimate earthworks, asphalt and other materials for preparation of bill of engineering measurement and evaluation; (CLO6)
7) Carry out highway maintenance and rehabilitation activities independently; (CLO 7)
8) Have proper understanding of highway finance and administration; (CLO 8)
9) Select appropriate equipment for a given type of construction (CLO 9)

CVE 451: Environmental Engineering Course Learning Outcomes (as defined by the Programme)
1) Understand water quality and treatment system (CLO1)
2) Explain water supply and distribution system (CLO2)
3) Analyze quantity and qualities of sewerage (CLO3)
4) Understand sewerage treatment system (CLO4)
5) Explain environmental Impact assessment 1 (CLO5)
6) Explain environmental Impact assessment 2 (CLO6)
7) Understand Introduction to Environmental Impact (CLO7)

CVE 471: Civil Engineering Practice
Course Learning Outcomes (as defined by the Programme)

- 1) Calculate the area and volume of any figure comprised of a combination of various shapes (CLO 1)
- 2) Measure and prepare bill of quantities for all building works from sub-structure to super-structure completely (CLO 2)
- 3) Measure drainage-excavations, pipes work, manholes, soakaway pits, septic tanks and other external works (CLO 3)
- 4) Explain different bill formats and their uses (CLO 4).
- 5) To have a sound knowledge of contract documents and their conditions (CLO 5)
- 6) Measure earthworks, retaining walls, pile foundations, tunnels and roads (CLO 6).
- 7) Write a simple specification for minor works (CLO 7)
- 8) Process quantities, editing and present bill of engineering measurement for civil engineering works (CLO8)

CVE 401: Engineering Communications
Course Learning Outcomes (as defined by the Programme)

- 1) Select a research problem (CL0 1).
- 2) Formulate a research problem (CL0 2).
- 3) Know theoretical/conceptual basis of research (CL0 3).
- 4) Know how to analyze data (CL0 4).
- 5) Know how to present information/data (CL0 5).
- 6) Know how to write a research work or project (CL0 6)

CVE 521: Highway and Traffic Engineering
Course Learning Outcomes (as defined by the Programme)

- 1) Have the knowledge of the types of materials used for the construction of highways (CL0 1).
- 2) Understand various materials testing methods (CL0 2).
- 3) Perform testing of highways materials for quality control (CL0 3).
- 4) Prepare materials specifications and recommendations (CL0 4).
- 5) Identify likely field problems and provide remedial solutions (CL0 5).

CVE 531: Structural Design
Course Learning Outcomes (as defined by the Programme)

- 1) To give an experience in the implementation of analysis concepts which are applied for the design of the field of structural engineering. (CLO1)
- 2) To develop further methods for the static elastic analysis for indeterminate structures and introduce methods for the plastic analysis of structures and material failure criteria. (CLO2)
- 3) To develop an understanding of elastic instability, critical load analysis and structural dynamics (CLO3).
- 4) To teach plates in flexure and finite element methods of structural analysis. (CLO4)
- 5) Design and analysis of the curved members and non-prismatic structures. (CLO5)

CVE 541: Geotechnical Engineering I
Course Learning Outcomes (as defined by the Programme)

- 1) Write a geotechnical Report. (CLO1)
- 2) Interpret borehole log data to determine soil parameters and develop a geotechnical model. (CLO2)
- 3) Design foundations (shallow, piled, raft) and retaining wall systems. (CLO3)
- 4) Understand basic principles of soil mechanics and the limitations of these theories. (CLO4)
- 5) Creatively apply theories of soil mechanics to foundation design; in particular, deal with parameter variability and uncertainty that arises with real problems. (CLO5)

6) Ability to interpret result of a site investigation; to use laboratory and field data to design simple foundations. (CLO6)
7) Analyze important boring tools/equipment such as Augers and Drills. (CLO7)

CVE 571: Construction Engineering 1 Course Learning Outcomes (as defined by the Programme)
1) Understand the concept of site organization (CLO1)
2) Understand the techniques, procedures and plants involved in large scale earth movement (CLO2)
3) Understand the principles and construction of formwork (CLO3)
4) Understand the construction techniques, Materials and procedures involved in Sheet piling, Underpinning, Retaining wall, Cofferdam and Scaffolding (CLO4)
5) Construction contract and Financing (CLO 5)

CVE 551: Foundation Engineering Course Learning Outcomes (as defined by the Programme)
1) Understand and review basic information from Soil Mechanics (CLO1)
2) Understand better the mathematical bases of stresses in soils and design phases of simple foundation, seepage and flow net (CLO2)
3) Understand the meaning of active and pressures as well as failures exhibited in foundation (CLO3)
4) Explain the different conditions of Bearing Capacity (CLO4)
5) Describe the basic principles and operation of bearing capacity for Terzaghi and Meyerhof (CLO5)
6) Explain the basic factors of settlements and Consolidation in foundation (CLO6)
7) Understand the areas of applications of site investigation as related to Foundation Engineering (CLO7)
8) Analyze important boring tools/equipment such as Augers and Drills (CLO8)

CVE 512: Hydraulic Designs Course Learning Outcomes (as defined by the Programme)
1) This course provides a broad understanding of the basic principles of hydraulic structures. (CLO1)
2) To be familiar with the study of reservoir with reference to types, selection of sites, storage capacity, operations, siltation and silt removal.
3) Understanding various types of dams, techniques for site location, classification and types selection. Seepage and causes of failures in dams.
4) Design of various types of hydraulic structures.
5) Design and analysis of different types of dams and spillways.

CVE 522: Waste Management Engineering Course Learning Outcomes (as defined by the Programme)
1) Explain the theory and application of physical, chemical and biological operations in water and wastewater treatment. (CLO2)
2) Understand Reactor Engineering in wastewater treatment. (CLO3)
3) Explain equalization and floatation as applied to wastewater treatment. (CLO4)
4) Explain Taste, odor removal and water softening. (CLO5)
5) Understand Treatability Studies: Activated sludge process, Biological filtration. (CLO6)
6) Explain Stabilization ponds and Anaerobic sludge digestion (CLO7)
7) Explain thickening and disposal/ removal. (CLO8)

Mapping of CLOs to POs are presented in Annex B-2.

CVE 542: Construction Technology II Course Learning Outcomes (as defined by the Programme)

1) Understand the principles and techniques of water supply to buildings (CLO1)
2) Understand the drainage systems in building (CLO2)
3) Know the various equipment used for moving people in high rise building (CLO3)
4) Understand natural and mechanical methods of ventilation (CLO4)
5) Know the basic electrical installation in building and on the site (CLO5)
6) Know the provisions required for fire prevention (CLO6)

CVE 592: Traffic and Highway Engineering
Course Learning Outcomes (as defined by the Programme)

1) Draft design and construction plans for new transportation systems (CLO1)
2) Investigate traffic problems and identify solutions (CLO2)
3) Estimate project budgets for labor, materials, and equipment (CLO3)
4) Plan and design transportation systems for smooth operation (CLO4)
5) Develop plans for traffic control and management, such as signal timing plans and incident management plans (CLO 5)
6) Analyze traffic engineering data and draw conclusions and recommendations (CLO 6)

CVE 552: Terotechnology
Course Learning Outcomes (as defined by the Programme)

1) Meaning of the terms used in maintenance, repairs and related facilities; (CLO1)
2) Foundational failures in building; (CLO2)
3) Maintenance of masonry structures and finishes; (CLO3)
4) Maintenance of R.C.C structures; (CLO4)
5) Maintenance of water supply system, pavement and drainage ; (CLO 5)

CVE 594: Elements of Civil Engineering Practice
Course Learning Outcomes (as defined by the Programme)

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1) Have the knowledge of various engineering career tracks; (CLO1)
2) Identify the responsibilities and duties of professional sub disciplines in engineering projects; (CLO2)
3) Identify the roles of engineer in solving problems; (CLO3)
4) Have technical and non-technical communication skills in engineering; (CLO4)
5) Manage engineering projects using basic project management tools ; (CLO 5)

CVE 572: Geotechnical Engineering II Course Learning Outcomes (as defined by the Programme)
1) Discuss stress distribution in soils (CLO1)
2) Understand the design procedures in retaining walls (CLO2)
3) Understand foundation repair process (CLO3)
4) Explain the principles governing use of caisson foundation (CLO4)
5) Discuss ground improvement technique (CLO5)
6) Understand vibratory machine foundation (CLO6)