Govindrao Wanjari College of Engineering & Technology, Nagpur

DVV-Criterion- 02

2.6

Students Performance and Learning Outcomes

Index

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2	Vision, Mission statement and Program Outcomes of Institute	2021-2022
3	Photograph shows the Vision, Mission statements and Program Outcomes of Institute on display board, News Letter, Boucher and college website.	2021-2022
4	Vision, Mission statement and POs, PEOs, PSOs of Departments including COs of each subject.	2021-2022
5	Photograph shows the Vision, Mission statement and POs, PEOs, PSOs of Departments including COs of each subject on display board, News Letter, Boucher and college website.	2021-2022

2.6.1 Teachers and students are aware of the stated programme and course outcomes of the programmes offered by the institution

The institute at central level, while finalizing the learning outcomes considers remarks of representative of all stakeholders which includes staff and students.

Students Awareness:

Program Outcomes (POs), Program Specific outcomes (PSOs), Program educational Objectives (PEOs) and course outcomes (Cos) are published and disseminated through various medias such as display boards in the corridors, laboratories, HOD cabin, institute website etc. Also, all the outcomes are disseminated to the stakeholders through parents meet and alumni meet.

Staff Awareness:

Special brain storming sessions are arranged and staff takes active participation in these sessions for further modification and to understand the concept of learning outcomes. Learning outcomes are disseminated through display board, circulars, pamphlets etc.

Outcomes: Vision and Mission Statements of department were defined by involving the different levels of outcomes.

- Outcomes are the abilities the students acquire at the end of the program
- Outcomes provide the basis for an effective interaction among stakeholders
- It is the results-oriented thinking and is the opposite of input-based education where the emphasis is on the educational process and where we are happy to accept whatever is the result"

Levels of Outcomes

Program Outcomes: POs are the statements that describe what the students learn from engineering programs and should be able to do after completion of the program.

Program Specific Outcomes: PSOs are the statements that describe what the students of a specific engineering program should be able to do after completion of the program.

Program educational Objectives: PEOs are the statements that describe what the graduates should be able to do after few years of completion of the program.

Course Outcomes: COs are the statements that describe what the students should be able to do at the end of a course

VISION & MISSION OF INSTITUTE

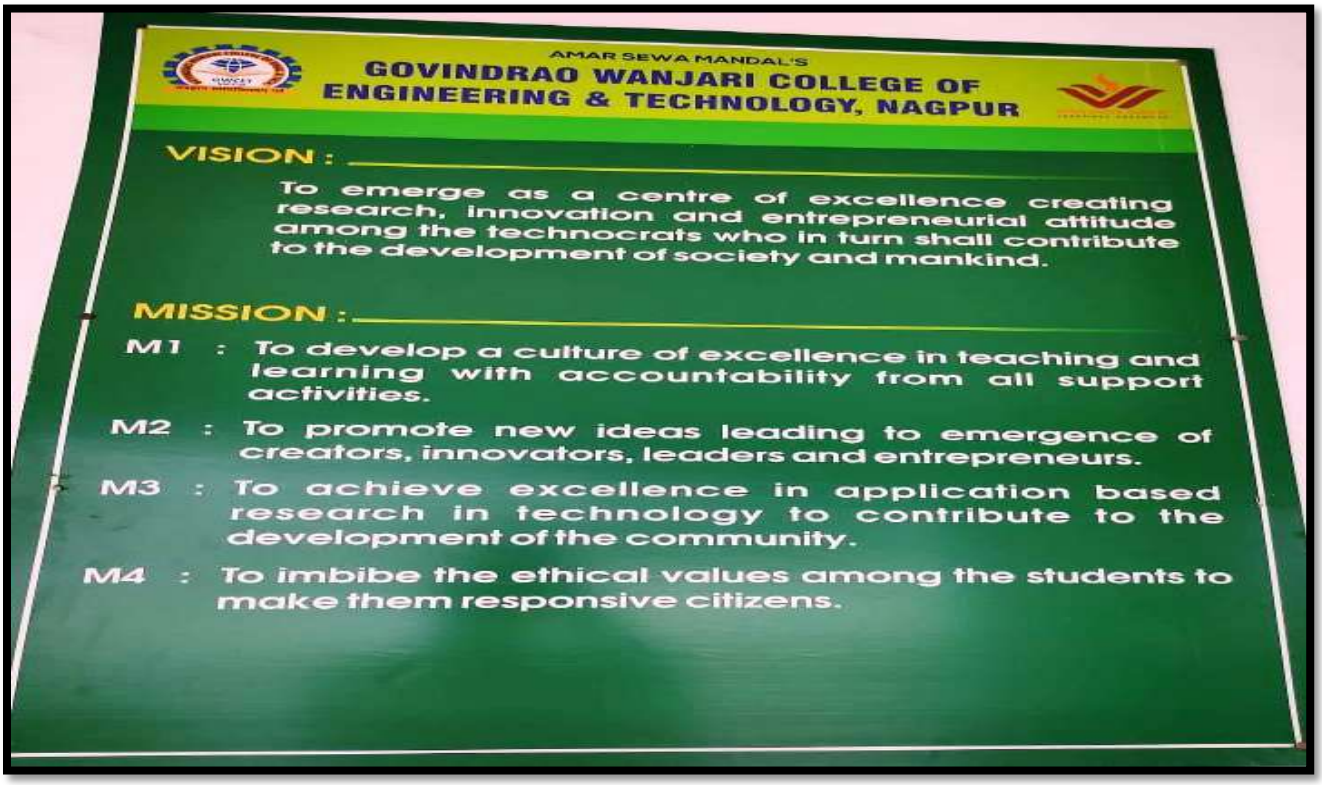
VISION:

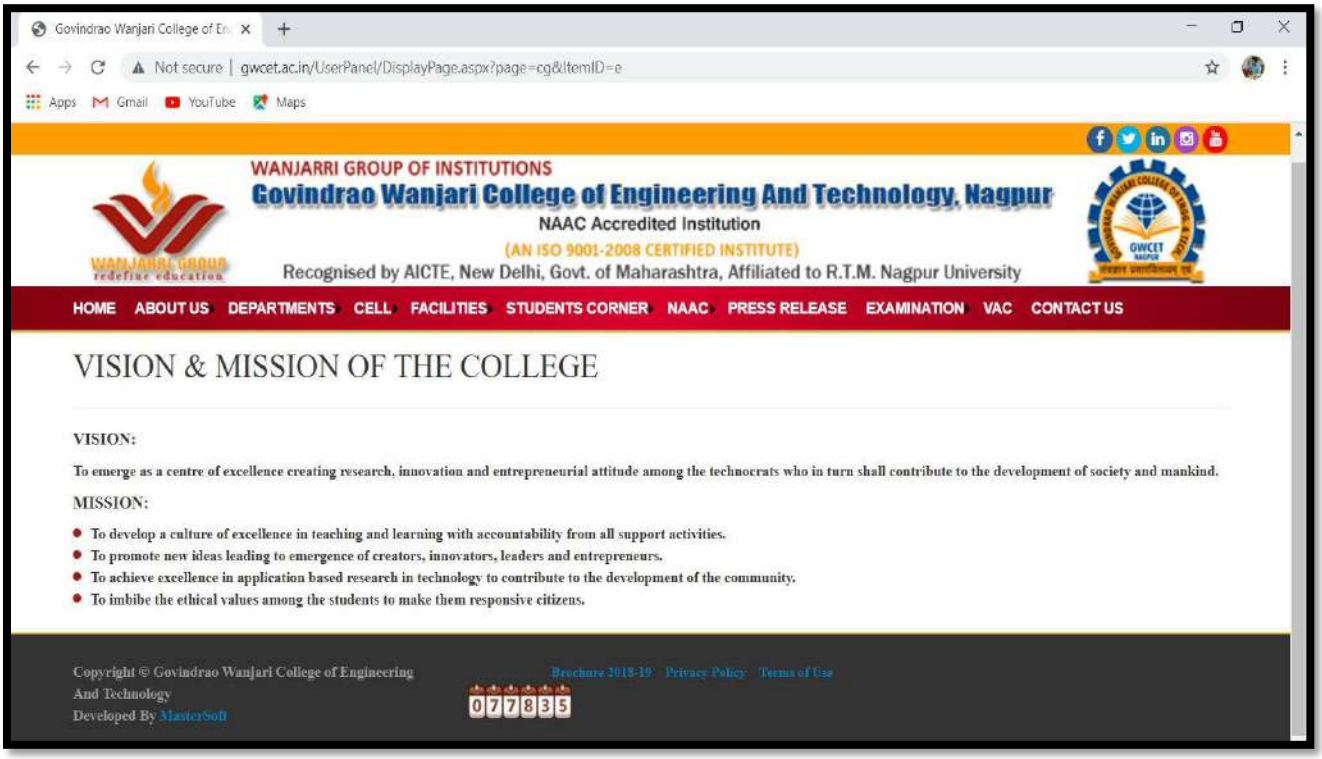
To emerge as a center of excellence creating research, innovation and entrepreneurial attitude among the technocrats who in turn shall contribute to the development of society and mankind.

MISSION:

- **To develop a culture of excellence in teaching and learning with accountability from all support activities.**
- **To promote new ideas leading to emergence of creators, innovators, leaders and entrepreneurs.**
- **To achieve excellence in application-based research in technology to contribute to the development of the community.**
- **To imbibe the ethical values among the students to make them responsive citizens.**

Photograph shows the Vision, Mission statements and Program Outcomes of Institute on display board, News Letter, Boucher and college website.





Vision, Mission statement and POs, PEOs, PSOs of **Departments**

Department of Mechanical Engineering

VISION

The Mechanical Engineering Department endeavors to be recognized globally for outstanding education and research and successful in advanced fields to cater the ever changing industrial demands and social needs.

MISSION

- **To provide state-of-the-art infrastructure to students in order to impart quality education in Mechanical Engineering.**
- **To enhance the overall academic performance of the students gradually, thereby increasing their placement potential.**
- **To develop the students for facing intellectual and ethical career challenges after graduation.**
- **To motivate for creative thinking, thereby enriching the teaching-learning experience and developing the research activity.**
- **To develop the Department of Mechanical Engineering as a centre of excellence in the field of 'Mechanical Design' as well as 'Thermal Engineering'.**

PROGRAM OUTCOMES (POS)

Engineering Graduates will be able to:

- **Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.**
- **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.**
- **Design/Development of solutions: 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.**
- **Conduct investigations of complex problems: 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.**
- **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.**
- **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.**
- **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.**
- **Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.**
- **Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.**
- **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.**
- **Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.**
- **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.**

PROGRAM SPECIFIC OUTCOMES (PSOS)

PSO1: An ability to identify, formulate and solve engineering problems in three core streams of Mechanical Engineering, i.e. design engineering, thermal and fluids engineering and manufacturing engineering.

PSO2: Graduates will be competent enough to learn managerial skills to work effectively in a team and in a society by following ethical and environmental practices

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

The Graduates of Mechanical Engineering will be able to

PEO1: Prepare for successful careers in industry that meets the needs of Industries.

PEO2: Develop the ability to synthesize data and technical concepts for application to product design

PEO3: Provide opportunity to work as part of teams on multi disciplinary projects

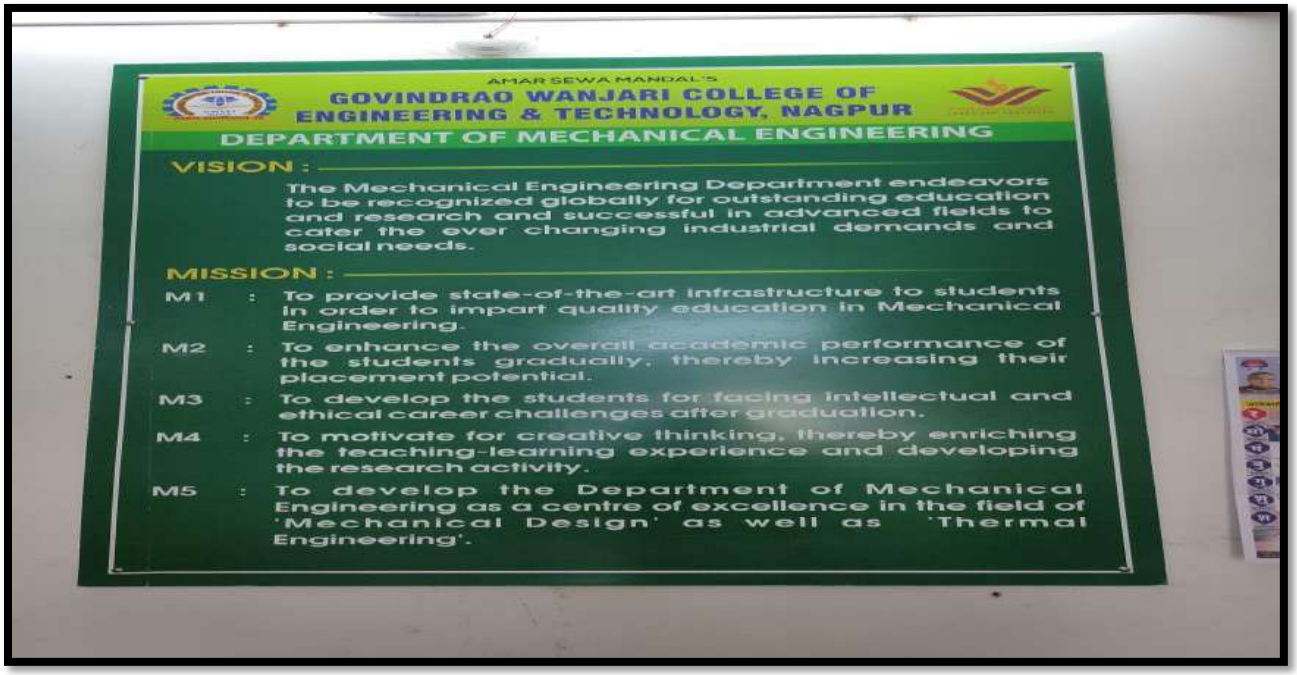
PEO4: Develop various soft skills in order to prepare them for pursuing diverse careers in industry

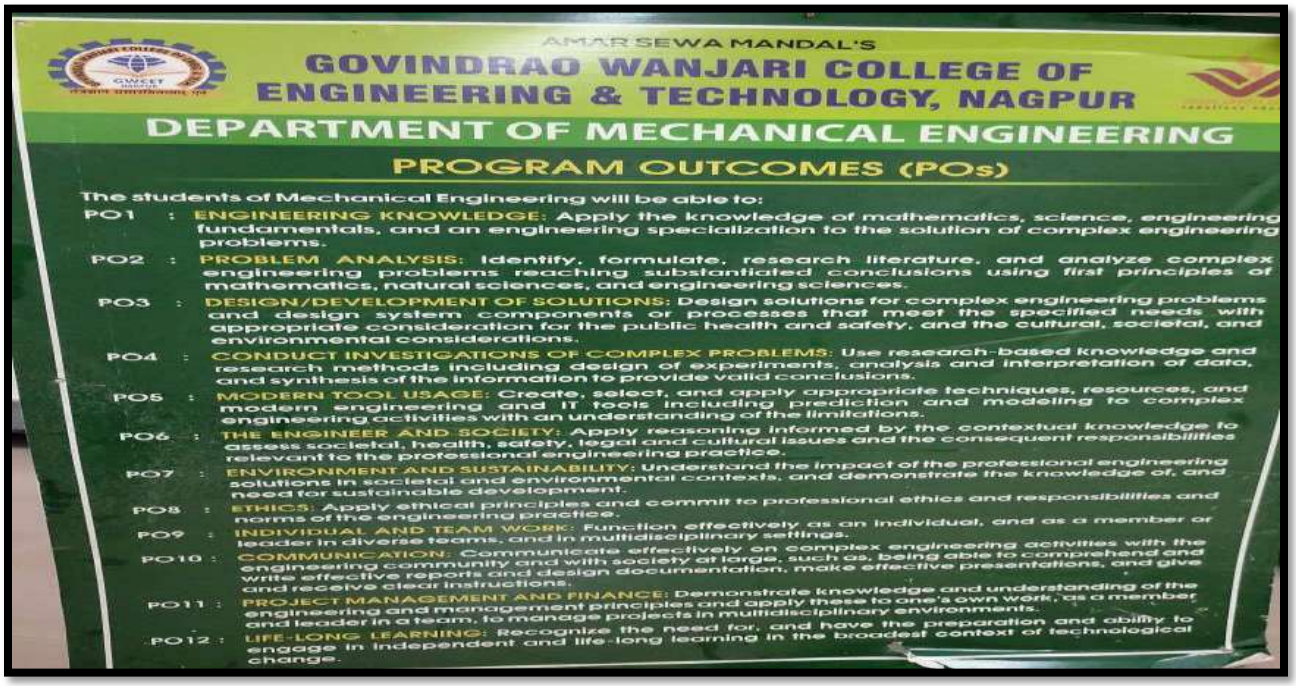
PEO5: Provide with a sound foundation in mathematical, scientific and engineering fundamentals necessary to formulate, solve and analyze engineering problems and to prepare them for graduate studies.

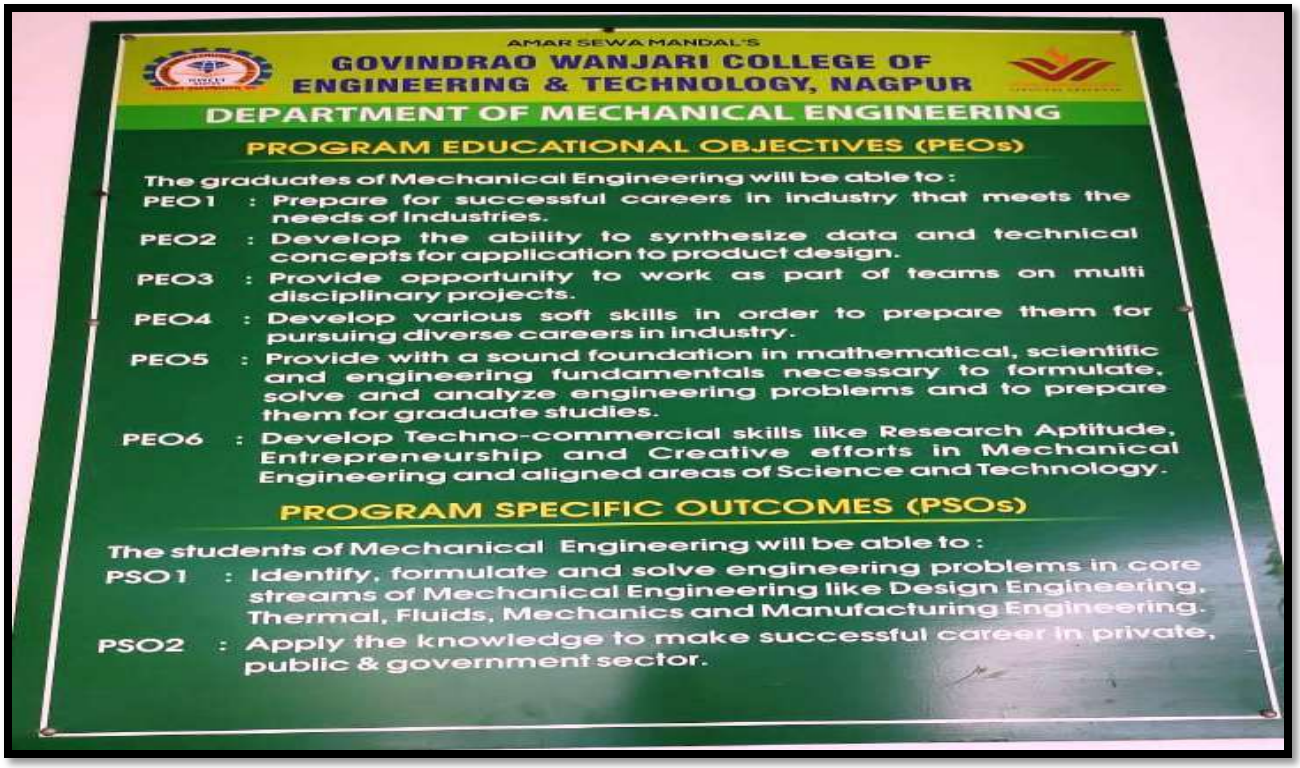
PEO6: Develop Techno-commercial skills like, Research Aptitude, Entrepreneurship and Creative efforts in Mechanical Engineering and aligned areas of Science and Technology.

Photograph shows the Vision, Mission statement and POs, PEOs, PSOs of Departments including COs of each subject on display board, News Letter, Boucher and college website.

Department of Mechanical Engineering






AMAR SEWA MANDAL'S
GOVINDRAO WANJARI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR
DEPARTMENT OF MECHANICAL ENGINEERING
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The students of Mechanical Engineering will be able to :
PSO1 : Identify, formulate and solve engineering problems in core streams of Mechanical Engineering like Design Engineering, Thermal, Fluids, Mechanics and Manufacturing Engineering.
PSO2 : Apply the knowledge to make successful career in private, public & government sector.


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DEPARTMENT NEWS
Ex CADCAD mentor shares his expertise with Engineering students
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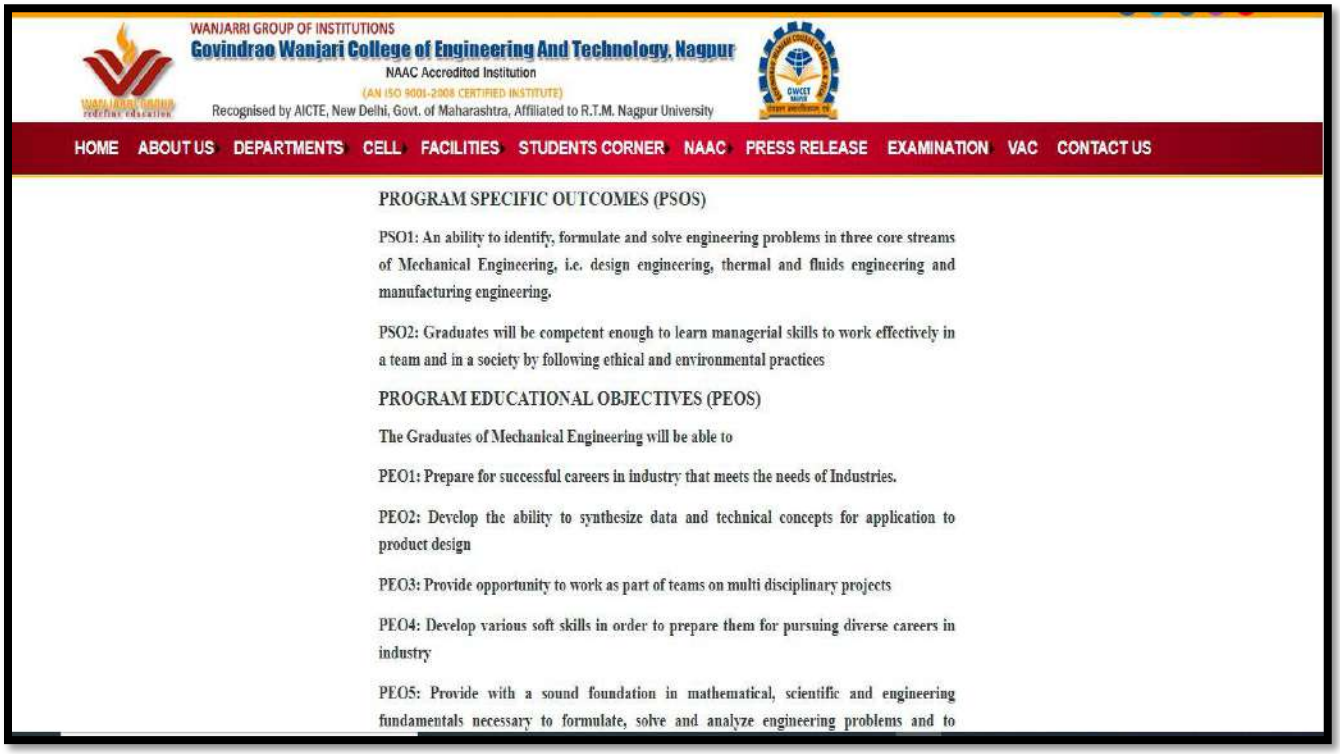
DEPARTMENT NEWS
Ex CADCAD mentor shares his expertise with Engineering students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AMAR SEWA MANDAL'S

GOVINDRAO WANJARI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE PLAN

NAME OF SUBJECT :- MECHANICAL MEASUREMENT AND METROLOGY
SUBJECT CODE :- BEME505T
SEMESTER :- V

COURSE OUTCOMES

After completion of the course students will be able to:

CO1	Understand the Basic concept of measuring system and generalized model of system elements and calibration.
CO2	Study the Measurement of linear and angular displacement, speed, load, force, torque & power without analytical treatment.
CO3	Study the Measurement of pressure, vacuum, sound, light and temperature without analytical treatment.
CO4	Understand the Basic concept of standards of measurement, requirement of interchangeability , measurement of straightness & flatness.
CO5	Study Limit, fit & tolerance analysis, Design of limit gauge & process planning sheet.
CO6	Understand the Use of comparators, optical profile projector and measurement of screw thread & gear tooth.

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DEPARTMENT OF MECHANICAL ENGINEERING

COURSE PLAN

NAME OF SUBJECT :- DYNAMICS OF MACHINES
SUBJECT CODE :- BEME605T
SEMESTER :- VI

COURSE OUTCOMES

After completion of the course students will be able to:

CO1	Understand the Concepts of machine element dynamics, D'Alembert Principle Concept of Precession, Gyroscopic Couple & Gyroscopic effect on airplane, ship & vehicle.
CO2	Learn the Dynamic force analysis of linkages by graphical method, virtual work method, Cam.
CO3	Understand the Balancing of rotating masses, balancing of reciprocating mechanism.
CO4	Study the Fluctuation of energy of Flywheel, Flywheel selection ,turning moment vs. crank angle diagram, concept, types, working & characteristics of Governor.
CO5	Solve the Derivation of equation of motion for vibratory system, free vibration of single degree of freedom.
CO6	Understand free damping with & without damping, Logarithmic decrement, Forced vibration of single degree of freedom system, vibration Isolation, whirling of shaft & critical speed of rotors.

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DEPARTMENT OF MECHANICAL ENGINEERING

COURSE PLAN

NAME OF SUBJECT :- HEAT TRANSFER
SUBJECT CODE :- BEME504T
SEMESTER :- V

COURSE OUTCOMES

After completion of the course students will be able to:

CO1	Remember & understand different modes of Heat Transfer, Laws of Heat Transfer and Steady State Heat Transfer.
CO2	Apply concept of unsteady state heat conduction and heat transfer through extended surfaces.
CO3	Understand the principle of convection and Empirical and practical correlation for forced convection.
CO4	Remember and understand of empirical all practical relations for free convectional systems.
CO5	Apply the concept of radiation heat transfer with and without radiation shield.
CO6	Analyze heat exchanger equipments.

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DEPARTMENT OF MECHANICAL ENGINEERING

COURSE PLAN

NAME OF SUBJECT :- DESIGN OF MACHINE ELEMENTS
SUBJECT CODE :- BEME502T
SEMESTER :- V

COURSE OUTCOMES

After completion of the course students will be able to:

CO1	Remember Machine Design and To Analyze & Evaluate Cotter Joint, Knuckle Joint, Riveted joints.
CO2	Evaluate Bolted Joint and Pressure Vessels.
CO3	Evaluate Shaft Design and Spring Design.
CO4	Evaluate Power Screws and Clutches & Brakes.

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GOVINDRAO WANJARI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE PLAN

NAME OF SUBJECT :- ADVANCED PRODUCTION PROCESSES
SUBJECT CODE :- BEME503T
SEMESTER :- V

COURSE OUTCOMES

After completion of the course students will be able to:

CO1	Study the Different types of non-conventional machining processes and its applications in industry.
CO2	Remember the Advanced joining processes, its classification and applications in industry.
CO3	Understand the Advance machining processes, its classification and applications in industry.
CO4	Understand the Die cutting operations, equipments for sheet metal working.
CO5	Study the Principle of jig and fixtures its classification and applications in industry.
CO6	Study the Principle of super finishing processes, advantages and disadvantages and application of LASER in surface modification.

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DEPARTMENT OF MECHANICAL ENGINEERING

COURSE PLAN

NAME OF SUBJECT :- INDUSTRIAL ECONOMICS AND ENTREPRENEURSHIP DEVELOPMENT
SUBJECT CODE :- BEME501T
SEMESTER :- V

COURSE OUTCOMES

After completion of the course students will be able to:

CO1	Understand the Basic concepts of Industrial Economics, its classification, Law of demand & various concepts related to demand.
CO2	Understand the Various factors of production, Polices of firm & industry, Cost concepts & Methods of Depreciation.
CO3	Study the Inflation & its effects, Direct & Indirect taxes, Types of Competition, Share Market & its terminologies.
CO4	Understand the Innovation, creativity, etc. Concepts, development, IPR, Patent & Laws related to Patents.
CO5	Remember the Concept & relations of Entrepreneurship, Entrepreneur, Growth affecting factors, various theories, Women Entrepreneurship & role, setup procedure & policies of SSI.
CO6	Understand the Preparation of project report, market survey & latest SSI schemes of DIC.

Department of Civil Engineering

VISION

To achieve excellent standards of quality education in Civil Engineering by keeping pace with rapidly changing technologies & to create technical manpower of global standards in Civil Engineering with capabilities of accepting new challenges.

To emerge as a cube of quality technical education to competent engineers technologies.

To create technical manpower of global standards in civil engineering with capabilities of accepting new challenges.

MISSION

To create competent professionals who are trained in the design and implementation of Civil Engineering systems

To impart quality education in civil engineering to raise satisfaction level of all stake holders.

To serve society and the nation by providing professional civil engineering leadership to find solution to community, regional and global problems and accept new challenges in rapidly changing technology.

To create competent professionals who are trained in the design and development of civil engineering systems and contribute towards research & development activities.

Programme Outcomes (PO's):

The students of civil engineering will be able to:-

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. 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.

PO3. Design/development of solutions: 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.

PO4. Conduct investigations of complex problems: 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.

PO5. 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 team work: 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. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

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.

Programme Specific Objective (PSO's):

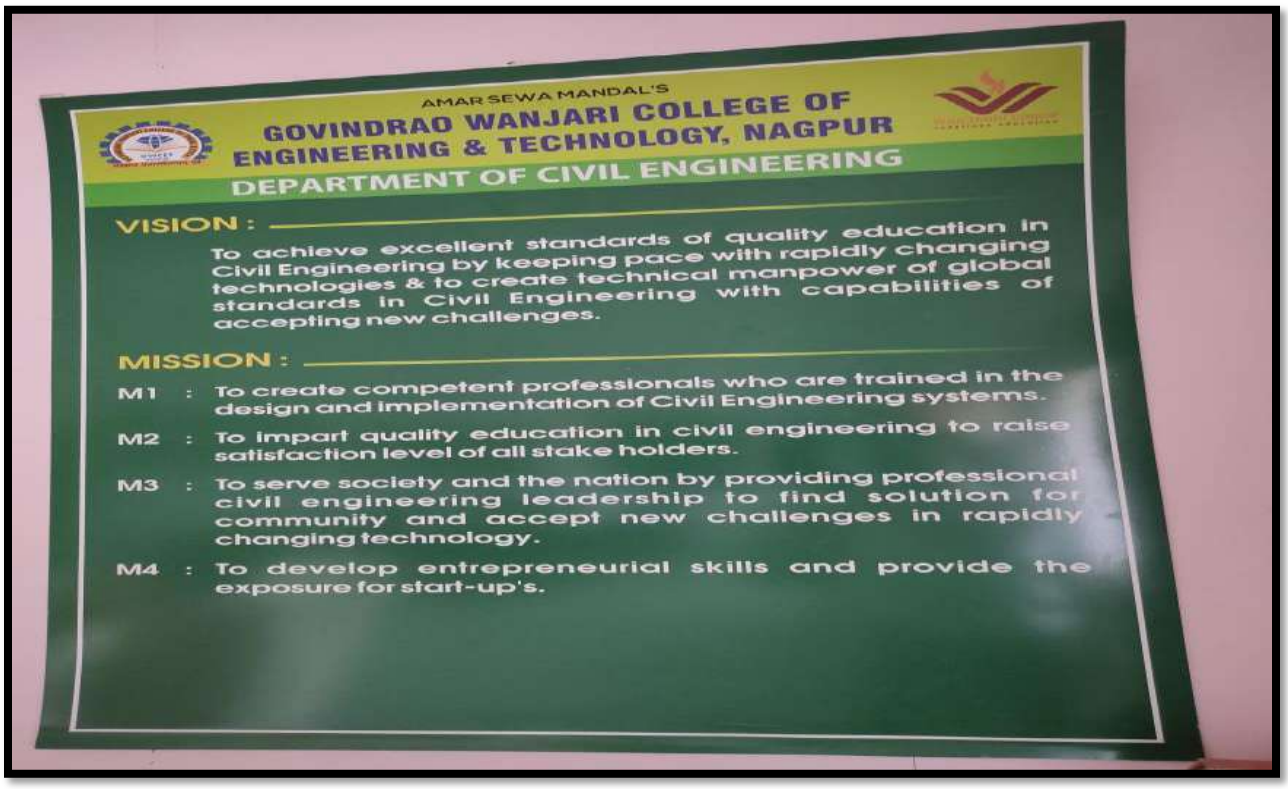
PSO 1. Students shall have abilities to work on projects towards infrastructure development, environment and sustainability.

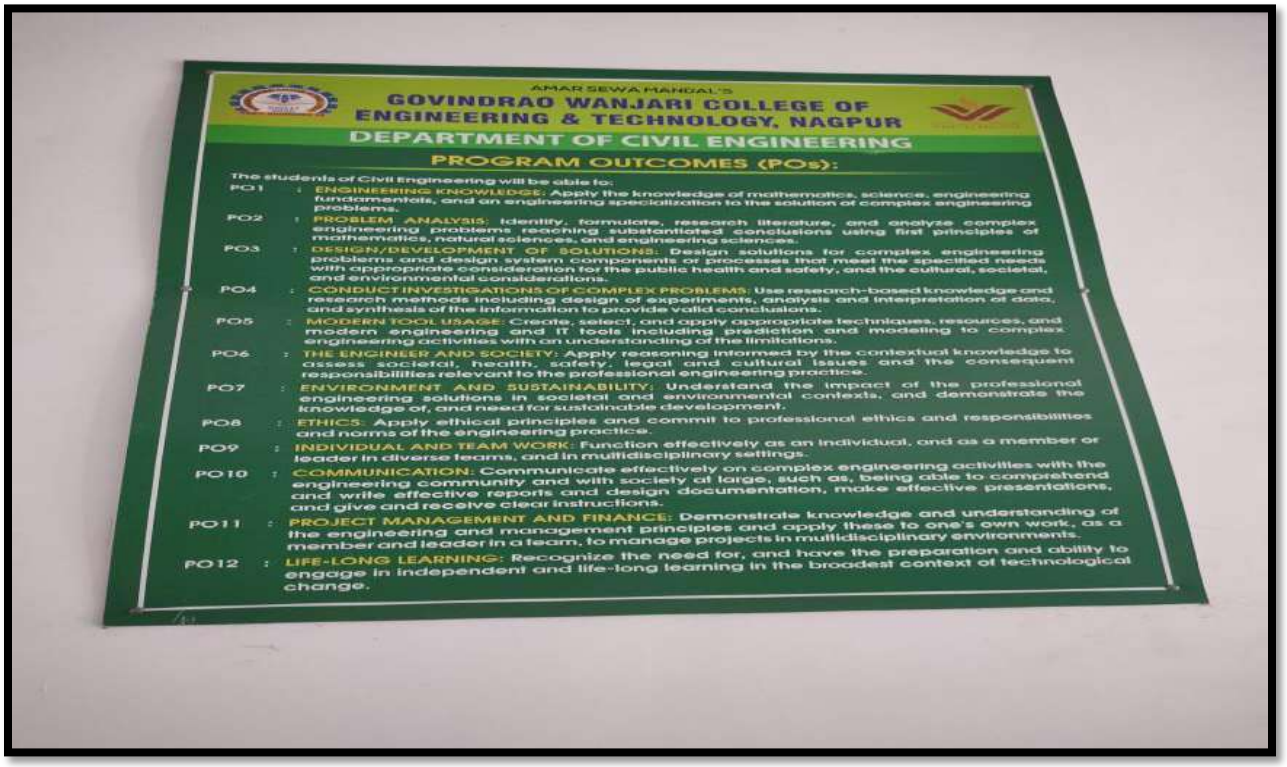
PSO 2. Students shall have contemporary knowledge in Civil Engineering to provide sustainable solutions to the societal problems.

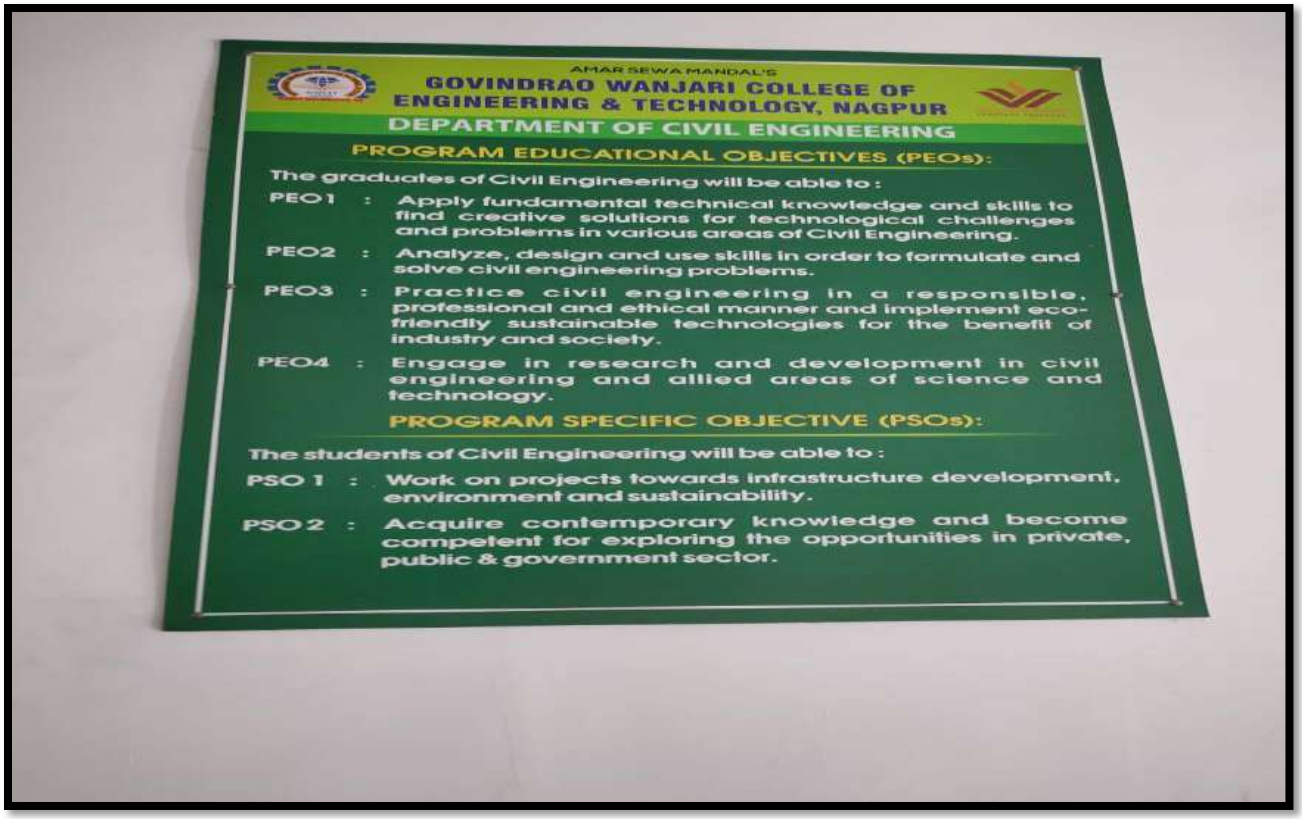
Programme Educational Objectives (PEOs):

- **The graduates of civil engineering will be able to apply fundamental technical knowledge and skills to find creative solutions to technological challenges and problems in various areas of basic sciences and engineering.**
- **Analyze, design and use skills in order to formulate and solve civil engineering problems.**
- **Practice civil engineering in a responsible, professional and ethical manner and implement eco- friendly sustainable technologies for the benefit of industry and society.**
- **Engage in research and development in civil engineering and allied areas of science and technology.**

Department of Civil Engineering






AMAR SEWA MANDAL'S
GOVINDRAO WANJARI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR
DEPARTMENT OF CIVIL ENGINEERING
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PEO1 : Apply fundamental technical knowledge and skills to find creative solutions for technological challenges and problems in various areas of Civil Engineering.
PEO2 : Analyze, design and use skills in order to formulate and solve civil engineering problems.
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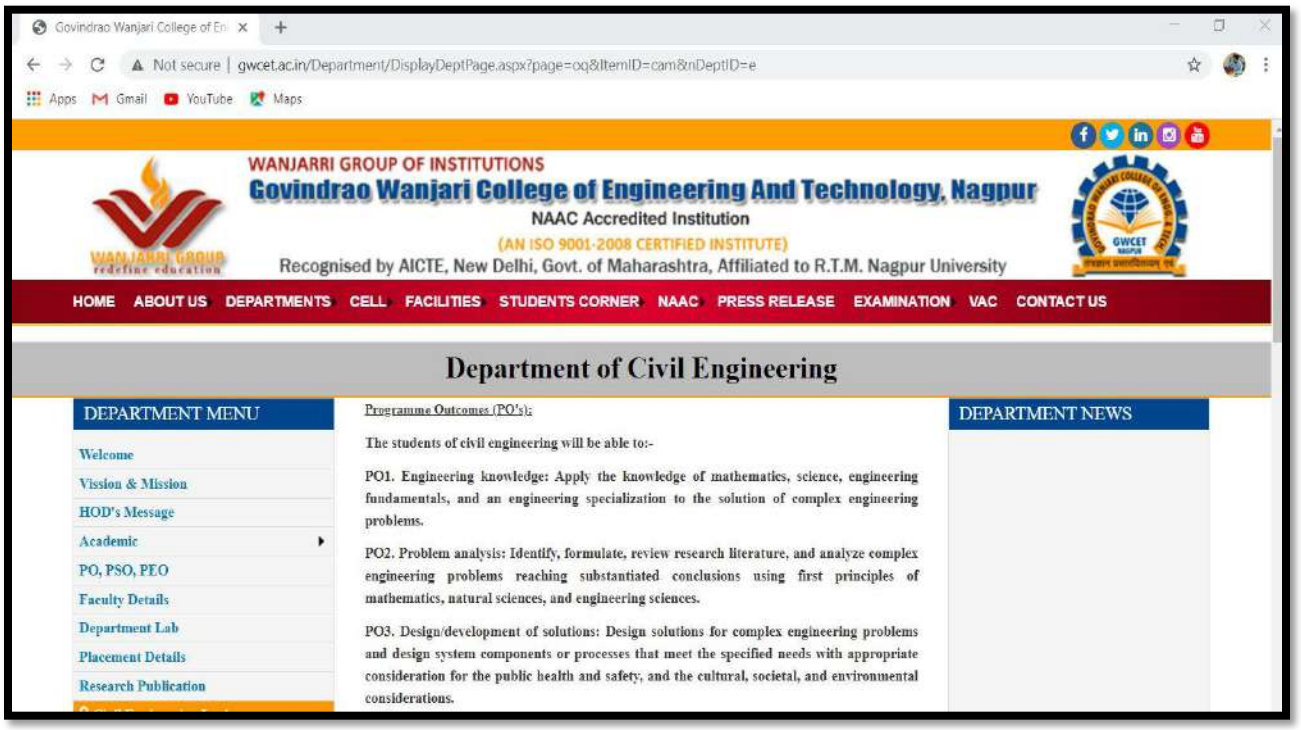
PROGRAM SPECIFIC OBJECTIVE (PSOs):
The students of Civil Engineering will be able to :
PSO 1 : Work on projects towards infrastructure development, environment and sustainability.
PSO 2 : Acquire contemporary knowledge and become competent for exploring the opportunities in private, public & government sector.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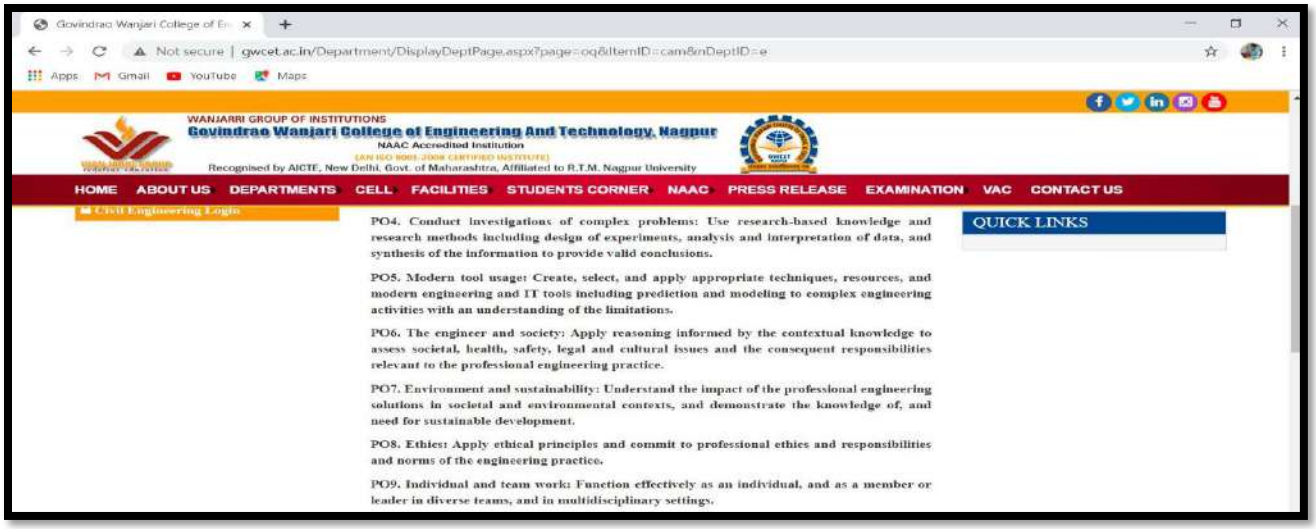
DEPARTMENT NEWS



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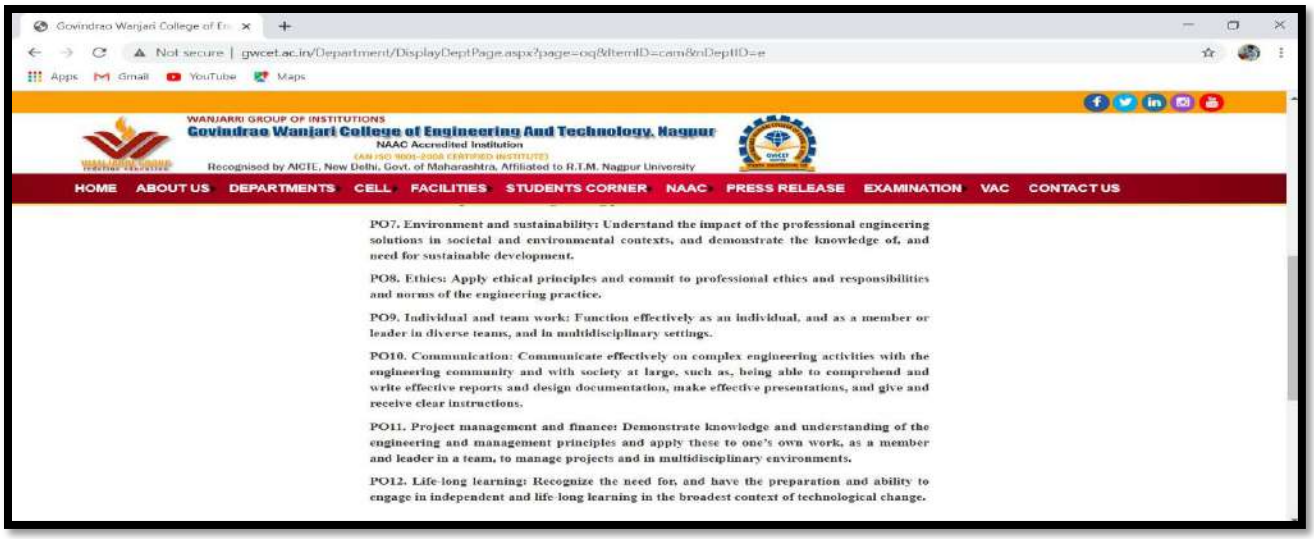

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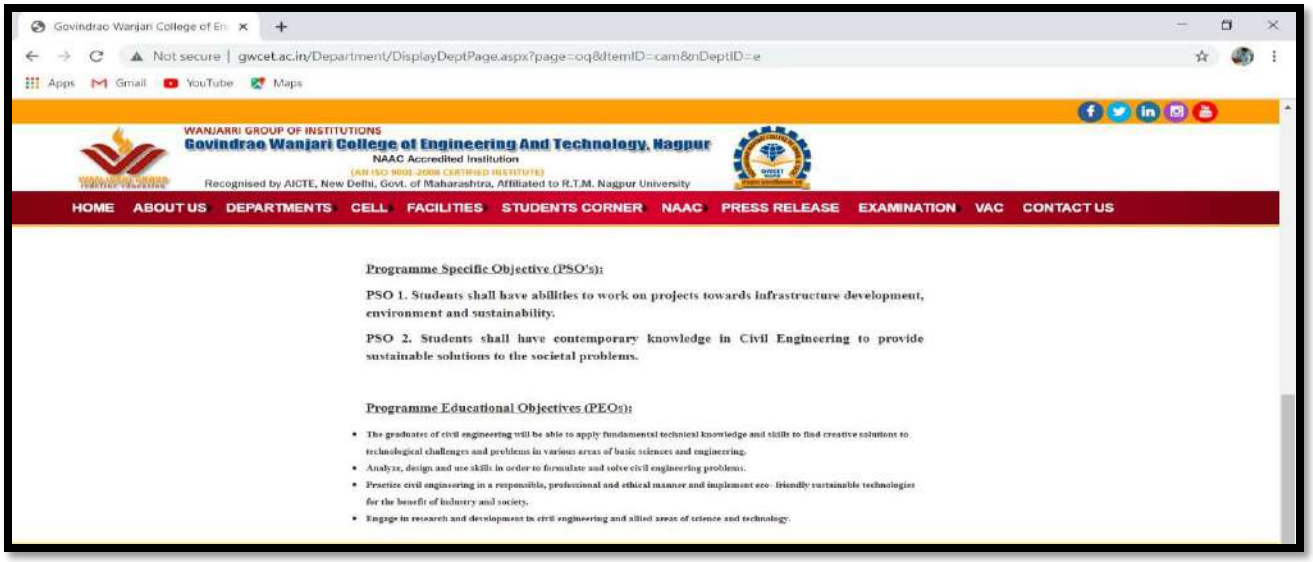
PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

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. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

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.



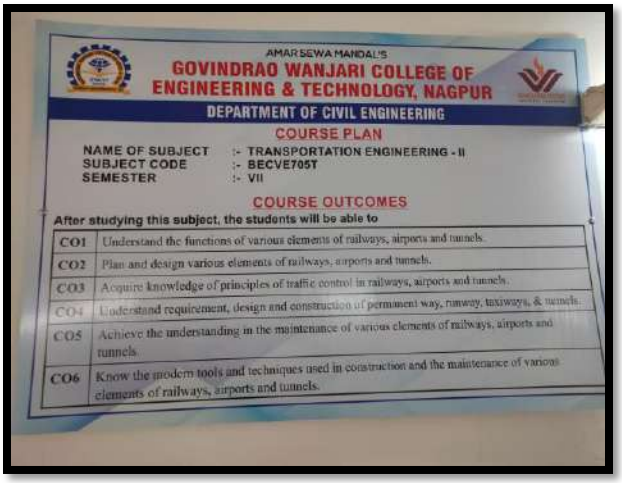
Programme Specific Objective (PSO's):

PSO 1. Students shall have abilities to work on projects towards infrastructure development, environment and sustainability.

PSO 2. Students shall have contemporary knowledge in Civil Engineering to provide sustainable solutions to the societal problems.

Programme Educational Objectives (PEOs):

- The graduates of civil engineering will be able to apply fundamental technical knowledge and skills to find creative solutions to technological challenges and problems in various areas of basic sciences and engineering.
- Analyze, design and use skills in order to formulate and solve civil engineering problems.
- Practice civil engineering in a responsible, professional and ethical manner and implement eco- friendly sustainable technologies for the benefit of industry and society.
- Engage in research and development in civil engineering and allied areas of science and technology.



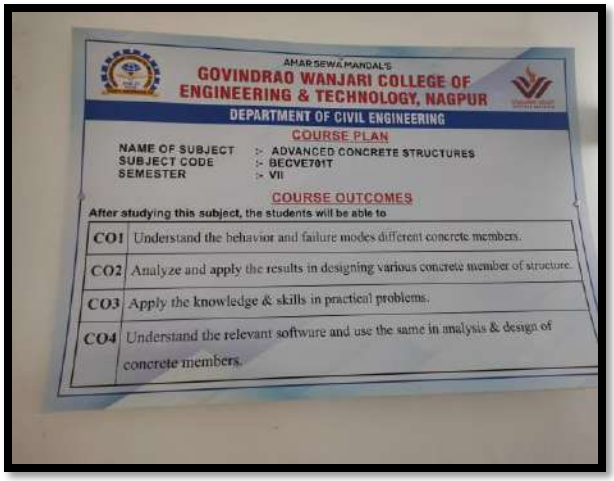
AMAR SEWA MANDAL'S
GOVINDRAO WANJARI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR
DEPARTMENT OF CIVIL ENGINEERING
COURSE PLAN

NAME OF SUBJECT :- TRANSPORTATION ENGINEERING - II
SUBJECT CODE :- BECVE705T
SEMESTER :- VII

COURSE OUTCOMES

After studying this subject, the students will be able to

CO1	Understand the functions of various elements of railways, airports and tunnels.
CO2	Plan and design various elements of railways, airports and tunnels.
CO3	Acquire knowledge of principles of traffic control in railways, airports and tunnels.
CO4	Understand requirement, design and construction of permanent way, runway, taxiways, & tunnels.
CO5	Achieve the understanding in the maintenance of various elements of railways, airports and tunnels.
CO6	Know the modern tools and techniques used in construction and the maintenance of various elements of railways, airports and tunnels.



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DEPARTMENT OF CIVIL ENGINEERING
COURSE PLAN

NAME OF SUBJECT :- ADVANCED CONCRETE STRUCTURES
SUBJECT CODE :- BECVE701T
SEMESTER :- VII

COURSE OUTCOMES

After studying this subject, the students will be able to

CO1	Understand the behavior and failure modes different concrete members.
CO2	Analyze and apply the results in designing various concrete member of structure.
CO3	Apply the knowledge & skills in practical problems.
CO4	Understand the relevant software and use the same in analysis & design of concrete members.

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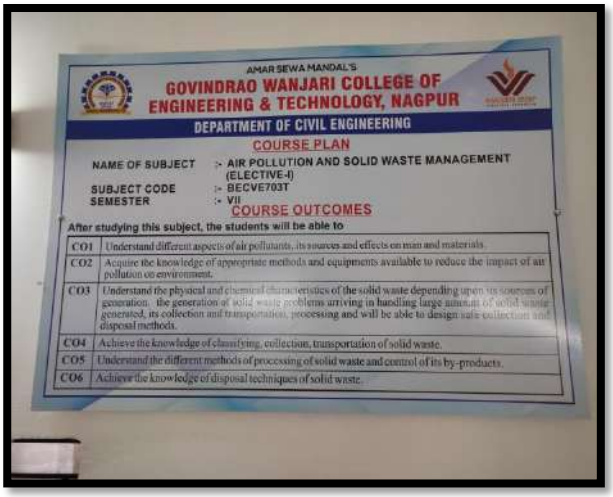
COURSE PLAN

NAME OF SUBJECT :- IRRIGATION ENGINEERING
SUBJECT CODE :- BECVE801T
SEMESTER :- VIII

COURSE OUTCOMES

After studying this subject, the students will be able to

CO1	Understand the importance and scope of irrigation engineering
CO2	Understand the methods and efficiencies of irrigation, crop water requirement.
CO3	Acquire the knowledge in planning, design and operation of storage reservoir and make use of it in the practical situation.
CO4	Understand the basic profile of dams and use the knowledge in checking stability of various types of dams
CO5	Name the theories of Canal design and apply the concept to design lined and unlined canals and sketched out the cross sections.
CO6	Solve water logging problems and provide the appropriate solution to it.



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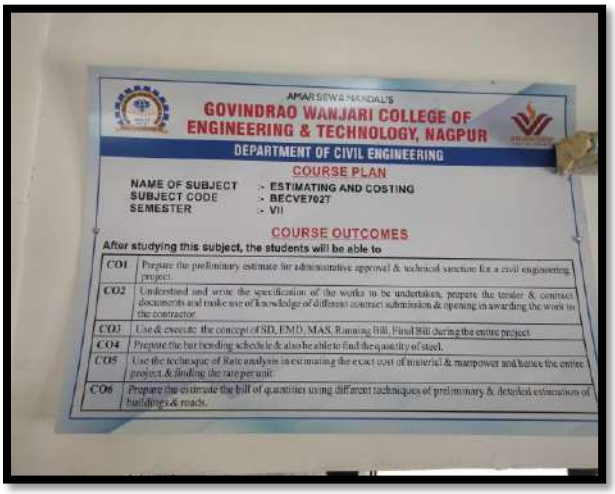
DEPARTMENT OF CIVIL ENGINEERING
COURSE PLAN

NAME OF SUBJECT :- AIR POLLUTION AND SOLID WASTE MANAGEMENT (ELECTIVE-I)
SUBJECT CODE :- BECVE703T
SEMESTER :- VII

COURSE OUTCOMES

After studying this subject, the students will be able to

CO1	Understand different aspects of air pollutants, its sources and effects on man and materials.
CO2	Acquire the knowledge of appropriate methods and equipments available to reduce the impact of air pollution on environment.
CO3	Understand the physical and chemical characteristics of the solid waste depending upon its sources of generation, the generation of solid waste problems arriving in handling large amount of solid waste generated, its collection and transportation, processing and will be able to design safe collection and disposal methods.
CO4	Achieve the knowledge of classifying, collection, transportation of solid waste.
CO5	Understand the different methods of processing of solid waste and control of its by-products.
CO6	Achieve the knowledge of disposal techniques of solid waste.



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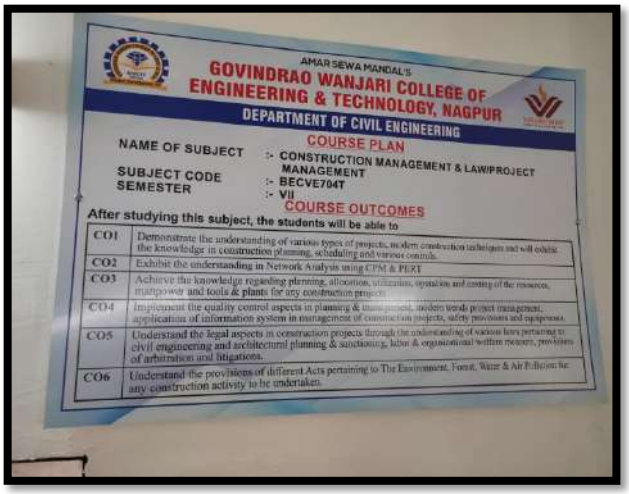
DEPARTMENT OF CIVIL ENGINEERING
COURSE PLAN

NAME OF SUBJECT :- ESTIMATING AND COSTING
SUBJECT CODE :- BECVE702T
SEMESTER :- VII

COURSE OUTCOMES

After studying this subject, the students will be able to

CO1	Prepare the preliminary estimate for administrative approval & technical sanction for a civil engineering project.
CO2	Understand and write the specification of the works to be undertaken, prepare the tender & contract documents and make use of knowledge of different contract submission & opening in awarding the work to the contractor
CO3	Use & execute the concept of SD, EMD, MAS, Running Bill, Final Bill during the entire project.
CO4	Prepare the bar bending schedule & also be able to find the quantity of steel.
CO5	Use the technique of Rate analysis in estimating the exact cost of material & manpower and hence the entire project & finding the rate per unit.
CO6	Prepare the estimate the bill of quantities using different techniques of preliminary & detailed estimation of buildings & roads.



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DEPARTMENT OF CIVIL ENGINEERING
COURSE PLAN

NAME OF SUBJECT :- CONSTRUCTION MANAGEMENT & LAW/PROJECT MANAGEMENT
SUBJECT CODE :- BECVE704T
SEMESTER :- VII

COURSE OUTCOMES

After studying this subject, the students will be able to

CO1	Demonstrate the understanding of various types of projects, modern construction techniques and will exhibit the knowledge in construction planning, scheduling and various controls.
CO2	Exhibit the understanding in Network Analysis using CPM & PERT
CO3	Achieve the knowledge regarding planning, allocation, utilization, operation and costing of the resources, manpower and tools & plants for any construction projects
CO4	Implement the quality control aspects in planning & management, modern trends project management, applications of information system in management of construction projects, safety provisions and equipments.
CO5	Understand the legal aspects in construction projects through the understanding of various laws pertaining to civil engineering and architectural planning & sanctioning, labor & organizational welfare measure, provisions of arbitration and litigations.
CO6	Understand the provisions of different Acts pertaining to The Environment, Forest, Water & Air Pollution for any construction activity to be undertaken.