Do not agree to do any work unless you are sure you have the courage to do it. But when you accept a task, do not ever fail to carry it out. Everything should be done on time. – Mokshagundam Visvesvaraya

Volume 01
July 2022

Is Civil Engineering a Good Career Choice?

Certainly, it is. With the growing civil engineering scope and demand not only domestically but also internationally, makes it a great career choice for students interested in this field. The civil engineering job comes with various benefits, including:

- **High Salary**: Civil engineers earn competitive salaries around the world. This aspect appeals to a large number of science students, making it a sought-after career.
- **Job Stability**: A civil engineer's career is well-known for its stability. A civil engineer can practice anywhere in the entire world once they have obtained their license. This ensures a high level of job stability, and being competitive in the profession is not a major worry.
- **Continuous Education**: Civil engineering allows for continuous education throughout one's career. There is always the opportunity to learn something new and broaden one's knowledge set.
- **Unique Experience**: Each project undertaken as a civil engineer gives a one-of-a-kind experience. Every project introduces new tactics, approaches, and techniques to the area, contributing to the acquisition of valuable job expertise.

With the extensive civil engineering scope, job opportunities, and demand, it is vital to develop a set of skills required for success in the industry. Technical training, mathematical proficiency, strong written and oral communication skills, effective leadership abilities, organizational capabilities, problem-solving aptitude, decision-making skills, and keen attention to detail are all essential for managing diverse projects and ensuring success in civil engineering endeavors.

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Ref.: https://www.pw.live/exams/gate/civil-engineering-scope/

PROGRAMME OUTCOMES (POs)

PO1. Engineering knowledge: Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization in the field of Civil Engineering.

PO2. Problem analysis: Identify, formulate, analyse and solve complex problems in construction industries using principles of mathematics, natural sciences and engineering sciences.

PO3. Design/development of solutions: Design a solution for complex civil engineering problems and design system processes to meet specific needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PO4. Conduct investigations of complex problems: Conduct investigations of complex problems including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusion.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling 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: Understanding the impact of engineering solutions in social environment and demonstrate the knowledge for sustainable expansion.

PO8. Ethics: Apply ethical principles and commit to professional ethics and the norms of engineering practices.

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 with engineers and society to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions related to civil engineering professionals.

PO11. Project management and finance: Demonstrate and apply the knowledge of engineering and management principles to one's own work, as a team leader or a member to manage project in multidisciplinary environments.

PO12. Life-long learning: Recognize the need for, and have the ability to engage in independent and life-long learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1. Problem Analysis: Able to arrive solutions to real time problems related to various domains of civil engineering through problem solving skills.

PSO2. Design and Management: Able to design systems, components and processes considering safety, quality and cost consideration and able to prepare project documents, engineering drawings and construction schedules

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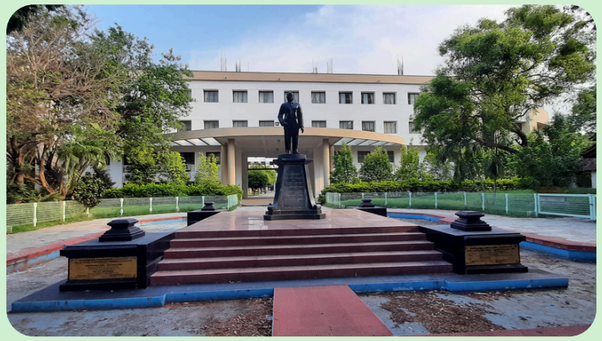

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About MCET

Dr. Mahalingam College of Engineering and Technology (MCET) was established in the year 1998 by Dr. M. Manickam with a view to commemorate the 75th birthday of his beloved father Arutchelvar Dr. N. Mahalingam with a mission to impart high quality competency based education in Engineering & Technology to the younger generation to acquire the required skills and abilities to face the challenging needs of the industry around the globe. MCET is a selffinancing, co-educational Autonomous Engineering College and it is approved by All India Council for Technical Education (AICTE), New Delhi & affiliated to Anna University, Chennai. The Institution has been accredited by NAAC with A++ grade and all eligible UG Programmes are accredited by NBA. MCET currently offers 10 UG 6 PG and 5 doctoral Programmes in Engineering, Technology and Science.

About the Department

Civil Engineering is the oldest engineering discipline that deals with the planning, design, construction and maintenance of the physical and natural built environment, including works like buildings, bridges, canals, dams and roads. The department of Civil Engineering at MCET was started in the year 2007 with B.E. – Civil Engineering Program and extended in 2012 for Post Graduate program in M.E. – Structural Engineering. The Department of Civil Engineering at MCET has highly qualified and experienced faculty in diversified domains which helps to enlighten the young minds of students in the theoretical and experimental aspects. Department has state-of-art infrastructural facilities which provide expertise and facility to work on emerging technologies. In a nut shell the department is well nurtured to cater the needs of education through industry oriented curriculum, research, consultancy, co-curricular and extra-curricular programs for the career enhancement of the students.

Department Vision

To develop Competent Civil Engineers to meet the infrastructure challenges of India and the world.

Department Mission

·To become one of the reputed departments offering Civil Engineering Program in the country.
·To produce excellent engineers to cope up with the changes through dynamic, innovative, and flexible curriculum.
·To provide a conducive environment for teaching & learning and to develop leaders with effective communication skills.
·To conduct quality research driven by industry & societal needs and provide affordable engineering solutions in an ethical way.

Programme Educational Objectives

PEO1: Graduates who effectively demonstrate engineering knowledge, problem solving skill, design capabilities and entrepreneurial skills by providing practical solutions.
PEO2: Graduates who effectively demonstrate professionalism in multi-disciplinary engineering environment, leadership quality, teamwork and engage in life-long learning.
PEO3: Graduates who demonstrate an ethical commitment to the community and the profession through involvement with professional societies.
PEO4: Graduates who make contributions to knowledge and establish best engineering practice through research and development.

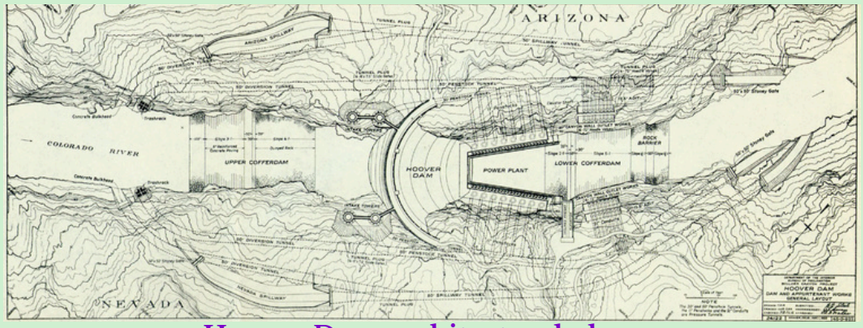
Most Impressive Civil Engineering Projects of All Time

Hoover Dam

Arizona, USA :: 1936

Hoover Dam is a concrete arch-gravity dam in the Black Canyon of the Colorado River, on the border between the U.S. states of Nevada and Arizona. The wedge-shaped dam would be 660 ft (200 m) thick at the bottom, narrowing to 45 ft (14 m) at the top.

Constructed between 1930 and 1936, it is the highest concrete arch-gravity dam in the United States. It impounds Lake Mead, which extends for 115 miles (185 km) upstream and is one of the largest artificial lakes in the world.



Hoover Dam architectural plan

'The function of engineering is to assist man in making his life more comfortable. The ultimate aim of engineering is to enable humanity to better serve life."

– Joseph-Armand Bombardier

Sustainable Civil Engineering

'The engineer must be able to see not only what exists but what may exist, what should exist and what could exist. He must also be able to conceive what does not yet exist."

– Ludwig Mies van der Rohe

Student Corner

CHALLENGES FACED BY CIVIL ENGINEERS

Now a days, Civil engineers face a variety of challenges in their work, ranging from design and construction issues to environmental and societal concerns. Here are some common challenges faced by civil engineers along with potential solutions.

1. Aging Infrastructure- Many countries have aging infrastructure that requires maintenance, repair, or even replacement. Civil engineers need to find cost-effective solutions to address this issue. To provide a solution, Implement asset management strategies to prioritize maintenance and rehabilitation activities based on the condition of the infrastructure. Utilize innovative construction techniques and materials to extend the lifespan of structures.

2. Environmental Impact- Civil engineering projects can have significant environmental impacts, such as habitat destruction, pollution, and resource depletion. Engineers must find ways to minimize these effects. To provide solution, Incorporate sustainable design practices into projects, such as using recycled materials, optimizing energy efficiency, and implementing green infrastructure solutions like rain gardens and permeable pavements.

3. Urbanization and Population Growth - Rapid urbanization and population growth put pressure on existing infrastructure and require the development of new infrastructure to support growing communities.

4. Natural Disasters- Civil engineers must design structures that can withstand natural disasters like earthquakes, hurricanes, and floods. Ensuring the safety and resilience of infrastructure is crucial. To provide solution, Conduct thorough risk assessments and design structures to meet or exceed building codes and standards for specific hazards. Implement innovative engineering techniques, such as base isolation for earthquake-resistant buildings.

5. Budget Constraints- Projects often face budget limitations that can impact design choices, construction quality, and overall project success. To provide solution, Conduct thorough cost-benefit analyses to optimize project budgets. Explore alternative funding sources, such as public-private partnerships, to secure additional resources for infrastructure projects.

6. Regulatory Compliance- Civil engineers must navigate complex regulatory requirements and ensure that projects comply with various codes and standards. To provide solution, Stay up-to-date on regulations and standards, collaborate with regulatory agencies early in the project planning process, and engage with stakeholders to address compliance issues proactively.

By addressing these challenges with innovative solutions and best practices, civil engineers can overcome obstacles and deliver successful infrastructure projects that meet the needs of society while minimizing negative impacts on the environment.

Adarsh Vishwanathan-III year-Civil Engineering

Student Corner

MAJOR ENVIRONMENTAL ISSUES IN CIVIL ENGINEERING

Habitat destruction: Construction activities can disrupt natural habitats, leading to loss of biodiversity and ecosystem services. Rectification: Implementing environmental impact assessments before construction to identify sensitive areas and mitigate impacts through habitat restoration and preservation efforts. Air Pollution: Construction activities and heavy machinery can generate air pollutants such as dust, particulate matter, and emissions from diesel engines. Rectification: Using environmentally friendly construction methods, controlling dust emissions with water or dust suppression systems, and employing cleaner energy sources or equipment with advanced emissions controls. Water Pollution: Runoff from construction sites can carry sediment, chemicals, and other pollutants into water bodies, impacting water quality and aquatic ecosystems. Rectification: Implementing erosion and sediment control measures such as silt fences, sediment basins, and vegetative buffers, as well as proper management of construction waste to prevent contamination of water sources. Resource Depletion: Construction consumes significant amounts of raw materials such as aggregates, timber, and water, leading to resource depletion and increased energy consumption. Rectification: Adopting sustainable construction practices such as using recycled materials, minimizing waste generation through efficient design and construction techniques, and promoting resource-efficient building designs like green buildings. Energy Consumption: Construction and operation of infrastructure contribute to greenhouse gas emissions through energy consumption, particularly in buildings and transportation systems. Rectification: Designing energy-efficient buildings and infrastructure, integrating renewable energy sources such as solar and wind power, and optimizing transportation systems to reduce energy demand and emissions. Waste Generation: Construction activities generate significant amounts of waste, including demolition debris, packaging materials, and unused materials. Rectification: Implementing waste management plans to reduce, reuse, and recycle construction waste, promoting the use of prefabricated components to minimize on-site waste generation, and adopting circular economy principles to extend the life cycle of materials. Climate Change: Construction and infrastructure contribute to greenhouse gas emissions and can exacerbate the effects of climate change through increased urban heat island effects and disruption of natural drainage patterns. Rectification: Incorporating climate-resilient design features such as green roofs, permeable pavements, and natural drainage systems to mitigate urban heat island effects and reduce the risk of flooding, as well as integrating climate adaptation measures into infrastructure planning and design

Praveen Kumar.D-IV year-Civil Engineering