

## 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.

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

### PROGRAMME OUTCOMES (POs)

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| <p><b>PO1. Engineering knowledge:</b> Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization in the field of Civil Engineering.</p> <p><b>PO2. Problem analysis:</b> Identify, formulate, analyse and solve complex problems in construction industries using principles of mathematics, natural sciences and engineering sciences.</p> <p><b>PO3. Design/development of solutions:</b> 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.</p> <p><b>PO4. Conduct investigations of complex problems:</b> Conduct investigations of complex problems including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusion.</p> <p><b>PO5. Modern tool usage:</b> 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.</p> <p><b>PO6. The engineer and society:</b> 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.</p> | <p><b>PO7. Environment and sustainability:</b> Understanding the impact of engineering solutions in social environment and demonstrate the knowledge for sustainable expansion.</p> <p><b>PO8. Ethics:</b> Apply ethical principles and commit to professional ethics and the norms of engineering practices.</p> <p><b>PO9. Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.</p> <p><b>PO10. Communication:</b> 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.</p> <p><b>PO11. Project management and finance:</b> 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.</p> <p><b>PO12. Life-long learning:</b> Recognize the need for, and have the ability to engage in independent and life-long learning in the context of technological change.</p> |
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### 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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## Department of Civil Engineering Dr. Mahalingam College of Engineering and Technology

(An autonomous Institution)

Affiliated to Anna University, Chennai & approved by AICTE,

Accredited by NAAC with A++

Accredited by NBA - Tier I (Auto, Civil, CSE, EEE, ECE, ME & IT)

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[www.mcet.in](http://www.mcet.in)

## 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 75<sup>th</sup> 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 self-financing, 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.

### 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.

## 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.

### 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

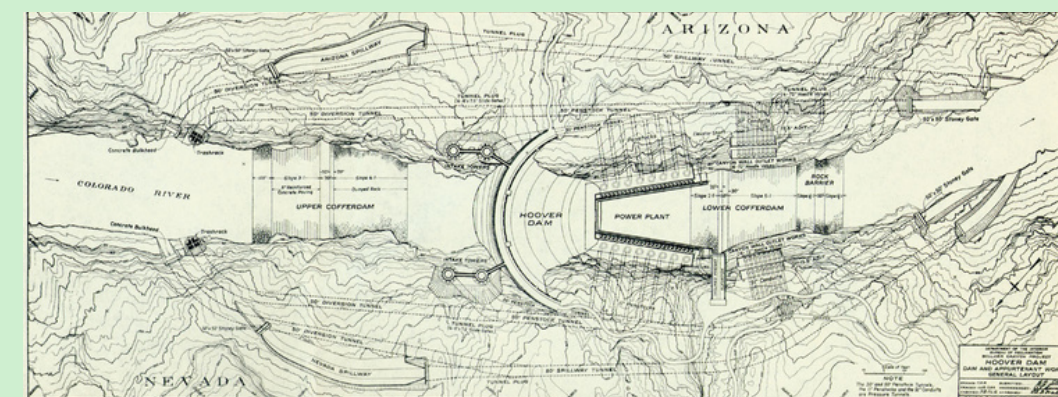
### Hoover Dam

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



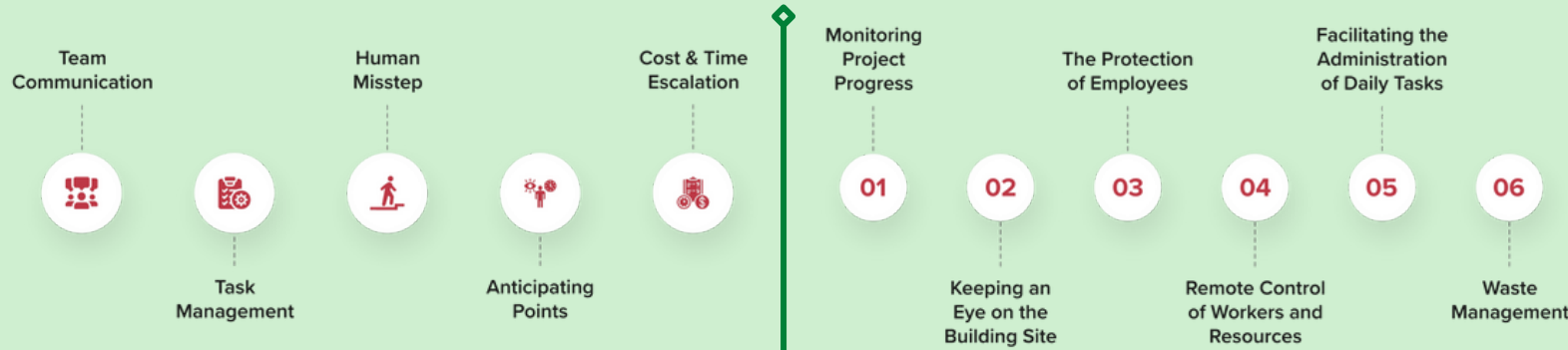
Sustainable Civil Engineering

"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

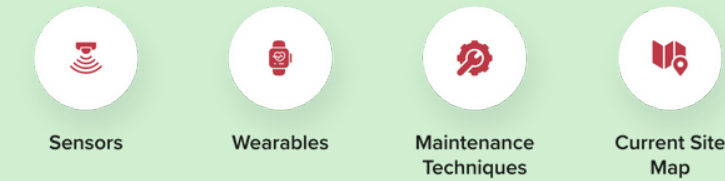


### IoT in Construction Industry



### Challenges in the Construction Industry

### IoT Solutions for the Construction Industry



### Applications: IoT in Construction



### Use Cases of IoT

Ref.: <https://www.quytech.com/blog/iot-in-construction-industry/>

### Amazing Architecture of Tamil Nadu

**GANGAIKONDA CHOLAPURAM** - The gigantic stone temple which Chola King Rajendra-I built is rich repository of beautiful sculptures of middle Chola period. The main temple tower stands 55 m tall and the imposing building is covered in rich art and sculptures that adorn the premises in absolute grandeur. The magnificent temple is built on an elevated structure. This temple is a living history of the Cholas in stone from the period of Rajendra-I and a beautiful gallery of Chola art and architecture. Many sculptures brought from Andhra, Karnataka and Bengal as war trophies are also preserved in the temple.



### RECENT TRENDS IN CIVIL ENGINEERING

#### • BUILDING INFORMATION MODELLING (BIM)

BIM is similar to CAD (computer-aided design), but not the same. It is software for 3D design to digitally model what is going to be built. The application of BIM increases prefabrication, modularization, and eco-friendliness. The model evolves as people contribute, streamlining the process and increasing efficiency. BIM also helps with problem-solving within the design and planning stages of a project, by automating clash detection and providing an entire picture of the project.

#### • 3D PRINTING

3D printing as a construction technology has the potential to vary material sourcing. From prefabrication materials for a Building to printing the whole structure on-site, ready to be used immediately. This can allow companies to get materials faster and streamline the process by removing extra steps in the middle. With 3D printing, it will be possible to print materials, as well as the whole structure. on-site, reducing waste, and further saving time and storage costs.

#### • EXOSKELETONS

Exoskeletons are wearable devices that work in sync with the user. Exoskeletons are placed on the user's body and act as enhancers that augment, reinforce, or reconstruct human performance. Helping to protect workers from manual handling injuries and the risk of hand-arm vibration, these mechanical suits that "augment" with human operatives delivers considerable gains in productivity.

#### • ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Implementation of AI on the worksite with the utilization of robotics for tasks like bricklaying and autonomous equipment will operate and complete tasks without the necessity for human interaction—one of the simplest emerging trends in engineering. AI and ML can benefit construction projects through increased safety, improving workflows, and getting jobs done faster and better. It also can identify when information or pieces are missing, and use the info it collects.

### Amazing Engineering Marvels in India

The Dhola-Sadiya Bridge, officially known as Bhupen Hazarika Bridge, is a beam bridge in India, connecting the northeast states of Assam and Arunachal Pradesh. The bridge is the first permanent road connection between the northern Assam and eastern Arunachal Pradesh. At 9.15 kilometres (5.69 mi) in length, it is the second longest bridge in India over water.



Inaugurated in 2019, Durgam Cheruvu Cable Bridge is a cable-stayed bridge that spans the Durgam Cheruvu lake in Hyderabad. It is suspended by cables from a single pylon that stands 49 metres tall. The bridge's unique design and construction required advanced engineering techniques.