

## DEPARTMENT OF CIVIL ENGINEERING

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### 1. Structural Engineering & Design

Structural design is a part of Structural Engineering which is a sub-division of Civil Engineering. Structural engineers are trained to design the structural elements accurately and supervise during construction to ensure the proper implementation of the structural design.

#### Skills to be Acquired:

Proficiency in CAD Software: Design engineers extensively use Computer-Aided Design (CAD) software for creating detailed designs and models of Civil components or systems.

#### Technical Knowledge:

- Using computer modelling simulations to predict how structures will act under varying conditions, i.e. high winds, flooding or earth tremors
- Calculating loads and stresses on structural foundations, beams and walls
- Ensuring projects meet legal, environmental and health and safety standards
- Advising on suitable materials for a build
- Inspecting buildings to assess their structural integrity
- Advising on building repairs or demolition
- Preparing bids for tender
- Working with designers to develop construction plans and blueprints
- Improving a structure's energy efficiency
- Delivering progress reports
- Analysing building behaviour over time
- Assisting with renovations, or restoring heritage buildings to extend their lifespan
- Working at a client's business, on a construction site or in an office, often outdoors or in noisy, dusty and cramped conditions.

#### Courses to be Done:

**Advanced Courses in CAD Software:** Acquiring advanced knowledge and skills in CAD software Like AutoCAD through specialized courses or certifications can enhance the career prospects of design engineers.

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**Professional Development Courses:** Design engineers can also benefit from professional development courses that focus on specific areas such as finite element analysis (FEA), ETABS(CFD), Stadd Pro, SAP, SAFE, Tekla Structural Design Engineer.

**Job Prospects and Salary Expectations:**

Structural Design Engineer salary in India ranges between ₹1.9 Lakhs to 9.3 Lakhs with an average annual salary of ₹.2 Lakhs. Salary estimates are based on 4.1k latest salaries received from Structural Design Engineers.

**Companies Providing Job Opportunities:**

Several companies in India provide job opportunities for design engineers. Some of the well-known companies that hire design engineers include:

1. Afcons Infrastructure Limited
2. Punj Lloyd
3. Gammon Infrastructure Projects Limited (GIPL)
4. Ground Engineering Ltd
5. Stewarts & Lloyds of India Ltd
6. Coastal Projects Pvt Ltd (CPPL)
7. Bridge & Roof Co (India) Limited
8. Larsen &Toubro Ltd Corporate Office
9. Hindustan Construction Company
- 10 GMR Group Corporate Office
11. Tata Projects Ltd
12. DLF Limited

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### **2. Construction Technology & Management**

Construction Technology Management explores the overall planning, co-ordination and control of projects from start to finish and helps in implementation of large Projects such as design and construction of structures and buildings, ship structures, aircraft, dams, roads etc.

#### **Skills to be Acquired:**

##### **1. Communication**

Construction managers can use their verbal and written communication skills to interact with many stakeholders, such as clients, outsourced suppliers and subcontractors. The successful completion of a project often relies on the collaboration of all involved parties, so your communication skills can help you secure the right paperwork and ensure that everyone understands the project's timeline.

##### **2. Industry knowledge**

It can be important for construction managers to stay up to date on the latest construction materials and techniques. Knowing this information can help you use innovative strategies and procedures to reach your construction goals and help you run a successful and efficient construction project.

##### **3. Risk management**

Construction managers can use their risk management skills to plan their projects, develop contingency plans and find quick solutions to problems. For example, if there's a chance that building supplies may not arrive on time for a project, a construction manager could identify solutions to this problem before the project begins so they can prepare their team ahead of time.

##### **4. Negotiation**

Construction managers often have strong negotiation skills that can help them communicate effectively with stakeholders. For example, you may need to negotiate budget allocation, create employee schedules and make order changes. Knowing how to negotiate well can help you make agreements that positively affect your projects and your employees.

##### **5. Team management**

Construction managers can use their team management skills to ensure effective collaboration between team members on a project. Managers can also use these skills to help their teams

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work toward a common goal. It's important for construction managers to use their team management abilities to handle issues in a collaborative, professional and prompt manner.

### 6. Financial management

Construction managers can use their financial management skills to create a budget plan, make financial forecasts and track project spending for a construction project. They may also use this skill to search for other financing opportunities for a project. Overall, good financial management skills can help you use a project's resources with greater efficiency.

### 7. Technology

Having a strong understanding of technology can help construction managers identify and use the latest technologies for their projects. The right technology can help you improve your crew's communication as well as your project's efficiency and overall quality. Because construction technology continues to develop, it can be important to identify technology that can add value to your projects.

### Courses to be Done:

There are several courses that one can complete to gain proficiency in Construction Technology & Management. The fundamental concepts and practical skills in this field are obtained from the courses such as CPM & PERT, Construction Planning, Construction Project Scheduling, Construction Risk Management, Construction Project Monitoring & Controlling & Construction Project Cash flow Management

### Job Prospects and Salary Expectations:

**Job Prospects:** Construction Management career can lead to job roles such as project manager, site engineer, estimator, or health and safety manager

**Salary Expectation:** Project Manager salary in India ranges between ₹4.2 Lakhs to ₹36.5 Lakhs with an average annual salary of ₹3.5 Lakhs

### Companies Providing Job Opportunities:

Several companies in India provide job opportunities for an Engineer. Some of the well-known companies that hire Construction Managers include:

1. Procore
2. Autodesk
3. PlanGrid
4. Bluebeam
5. HoloBuilder
6. Trimble
7. ProEst
8. Bentley Systems

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### 3. Software Engineering and Testing

Software testing is the process of evaluating and verifying that a software product or application does what it is supposed to do. The benefits of testing include preventing bugs, reducing development costs and improving performance

#### Skills to be Acquired:

Technical Knowledge:

Coding languages. Coding languages are the different types of source code a person can write for a software program

- Database knowledge
- Data structures and algorithms
- Source control
- Testing procedures
- Debugging knowledge
- Operating systems
- Cryptography

#### Courses to be Done:

An aspiring software tester should begin their journey by ensuring they have a basic knowledge in the relevant field. First, one need to learn the principles and types of Software Testing. Then, the best thing to go for would be to learn Selenium, which will make familiar with writing, running, and testing scripts in Advance C language , Java & SQL, Python, Ruby, etc. Finally, JMeter will allow to run functional testing on web applications.

#### Job Prospects and Salary Expectations:

Software Testers are in high demand as companies need to release reliable software, recover from failed releases, and meet users' needs in the ever-changing IT world.

The highest salary is reported at Accenture where the average pay is ₹7.41 LPA. Other companies that offer high salaries for this role are Infosys and Wipro at ₹5.27 LPA and ₹5.14 LPA respectively

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Top companies for Software Test Engineers in India

1. McAfee - ₹1,30,085per month.
2. Cisco System - ₹1,13,395per month.
3. Akamai - ₹1,07,970per month
4. Freshworks - ₹96,200per month
5. ANI Technologies Private Limited- ₹90,444per month

**Salary Expectation:** Manual Tester salary in India ranges between ₹.2 Lakhs to ₹ 6.0 Lakhs with an average annual salary of ₹ 3.2 Lakhs..

### Companies Providing Job Opportunities:

Several companies in India provide job opportunities for Software and Testing engineers. Some of the well-known companies that hire testing engineers include:

Best Companies for Software Engineers

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|---------------|-------------------------------------|
| 1. Google     | 8. Amazon                           |
| 2. Microsoft. | 9. Wipro.                           |
| 3. Meta       | 10. Tata Consultancy Services (TCS) |
| 4. Nvidia     | 11. Infosys                         |
| 5. Adobe      | 12. Cognizant                       |
| 6. Apple      | 13. Tech Mahindra                   |
| 7. Capgemini  | 14. Hexaware                        |