



## Software Engineering vs Computer Science

SE-113 Introduction to Software Engineering Course Teacher: S A M Matiur Rahman (SMR)

### Difference between Software Engineering and Computer Science

#### What is Software Engineering?

Software engineering is a process of analyzing user requirements and then designing, building, and testing software application which will satisfy those requirements.

It deals with creating new software that would be used in the real world. You would be required to work with a team to build a new application that your end-users would find beneficial.

#### What is Computer Science?

Computer science is a discipline that involves the design and understanding of computers and computational processes. It is a broad scientific topic. It includes the study of how data is processed, the security of networks, organizing databases, artificial intelligence, etc.

Much like other forms of science, computer science takes an abstract approach to computers and [computer programming](#). It explores how computers work in terms of algorithms and the computations that process which manipulates data with theories. Below is a key difference between Computer Science vs Software Engineering.

#### KEY DIFFERENCES:

- **Software engineering** is a process of analyzing, designing, building, and testing software applications while **Computer science** involves the design and understanding of computational processes.
- **Software Engineering** is a study of how software systems are built, whereas **Computer Science** is the study of how computers perform theoretical and mathematical tasks.
- You should select **Software Engineering** to learn about the overall working of the specific software while you should select **Computer Science** to learn about AI and machine learning.



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- Students of **software engineering** can take courses on project management while it is often included in the **computer science** curriculum.

### Why need Software Engineering?

Here, are reasons for using software engineering method:

- ✓ It allows you to improve the quality of the software products.
- ✓ To increase productivity &
- ✓ Provide job satisfaction to software professionals.
- ✓ It will enable you to control software schedules and to plan effectively.
- ✓ It helps to reduce the cost of software development.
- ✓ Allow you to meet the customers' needs and requirements.
- ✓ It helps you to support the engineers' activities systematically and efficiently.

### Why need Computer Science?

Here, are reasons for using Computer science:

- ✓ It is internationally recognized for its excellence in research, learning, and engagement with industry.
- ✓ Helps you to study basic computer fundamental mathematically and logically.
- ✓ Gives in-depth knowledge about the actual functioning of the computer



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Difference between **Software Engineering** and **Computer Science**.

Here are the important differences between Software Engineering and Computer Science:

| Parameter          | Software Engineering   | Computer Science  |
|--------------------|--|---|
| Definition         | Software engineering is defined as a process of analyzing user requirements and then designing, building, and testing software applications. | Computer science is a discipline that involves the design and understanding of computers and computational processes.                                       |
| Meanings           | Software Engineering is a study of how software systems are built.   | Computer Science is the study of how computers perform theoretical and mathematical jobs.   |
| Selection          | You should choose Software Engineering if you want to learn the overall life cycle of how specific software is built and maintained.         | You should choose Computer Science if you want to get into a specialized field in CS like artificial intelligence, machine learning, security, or graphics. |
| Project management | Students of software engineering will likely take courses on project management, both in undergraduate and graduate programs.                | Project management is often included in the computer science curriculum. Mostly as part of a software engineering course.                                   |
| Course include     | In Software Engineering, you will also learn programming languages and general computing principles.   | Computer science students will study how data is stored, processed, and applied on various other computing devices.   |
| Scope              | Emerging occupations related to software engineering depend on the state of software and technology in the future.                           | It is a field of computer science which also includes careers in cloud computing and AI technology.   |
| Developer          | The average salary for a software engineer is \$107,932 per year.  | The average salary for a computer scientist is \$103,643 per year in the United States.   |



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### Challenges of Software Engineering

Here are some important challenges of Software Engineering:

- In safety-critical areas such as space, aviation, nuclear power plants, etc. the cost of software failure can be massive because lives are at risk.
- Increased market demands for fast turnaround time.
- The diversity of software systems should be communicating with each other.

### Challenges of Computer Science

Here are some important challenges of Computer Science:

- The Internet's infrastructure will need to be updated to match the 'New Internet.'
- More customers are using mobile apps, so emphasizes on mobile platforms and cloud services is important.
- In 2020, 100-billion objects will be connected to the Internet
- Professionals rated data leaks and exposure of sensitive information as the highest concern

### Best Practice of Software Engineering

Here are some best practices for software engineers:

- Software engineers should act in such a way that it is beneficial to the client as well as the employer.
- Allows you to software products and related modifications that should meet the highest professional standards.
- It helps you to maintain integrity and independence in their professional approach.
- Promote an ethical approach for software development and maintenance.



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### Best Practice of Computer Science

Here are some critical best practices for Computer Science professionals:

- Make incremental changes.
- Optimize software only after it works correctly.
- Document design and purpose, not mechanics.
- Collaborate.

### Which is better? Computer Science or Software Engineering?

Both are the best in their own aspects. However, you should opt for the **Software engineering** if you are interested in software testing, software development and overall software life cycle or you can opt for **Computer Science** if you have an interest in artificial intelligence, machine learning, security, database management, etc.

### References:

[Computer Science Vs. Software Engineering: Key Differences \(guru99.com\)](https://www.guru99.com/computer-science-vs-software-engineering.html)