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**15/ENG05/012**

**MECHATRONICS ENGINEERING**

**MCT 506 ASSIGNMENT**

**1. Discuss in detail not more than one page the relationship between Software Engineering and Mechatronics Engineering**

Software engineering is a detailed study of engineering to the design, development and maintenance of software. It can also be defined as a process of analysing user requirements and then designing, building, and testing software application which will satisfy those requirements.

Mechatronic Engineering, on the other hand, combines the fundamentals of Mechanical, Electrical and Computer Science to develop autonomous systems. A Mechatronics Engineer designs smart machines and systems that are aware of their environment and can processing information to make decisions. Mechatronics engineering is a multidisciplinary skill. It combines a broad range of skill which include skills from software engineering.

Although it is mostly for applications with machines, mechatronics engineers are also expected to be able to design, build and test software that satisfy user requirements. So, a mechatronics engineer may be able to do the work of a software engineer, a software engineer cannot do the work of a mechatronics engineer because they do not learn the multiple disciplines the mechatronics engineer does such as mechanical engineering and control.

**2. Explain the following and how they relate: computer science, computer engineering and software engineering.**

**Computer science**, the study of computers and computing, including their theoretical and algorithmic foundations, hardware and software, and their uses for processing information.

The discipline of computer science includes the study of algorithms and data structures, computer and network design, modelling data and information processes, and artificial intelligence.

**Computer Engineering** is defined as the discipline that embodies the science and technology of design, construction, implementation, and maintenance of software and hardware components of modern computing systems and computer-controlled equipment. Computer engineering has traditionally been viewed as a combination of both computer science (CS) and electrical engineering (EE).

**Software engineering** is the application of principles used in the field of engineering, which usually deals with physical systems, to the design, development, testing, deployment and management of software systems. The field of software engineering applies the disciplined, structured approach to programming that is used in engineering to software development with the stated goal of improving the quality, time and budget efficiency, along with the assurance of structured testing and engineer certification.

Here are the major differences between them:

Computer science deals with the basic structure of a computer and is more theoretical. Hence, it is more malleable in terms of specialization, with the emphasis on math and science.

Software engineering, however, is a field concerned with the application of engineering processes to the creation, maintenance, and design of software for a variety of different purposes. A software engineer designs customized applications per the requirements of an organization.

A computer engineer is a professional who combines computer science with electrical engineering to build new computers and computer systems.