* **Introduction to Software Engineering**

This module introduces the Software Engineering concepts that are needed to develop software systems that can meet basic functional requirements within a given problem domain. It covers the main steps in the process of developing such systems, from requirements analysis through to their implementation and testing. A major part of the module involves students working in teams to develop a web-based software system, which gives practical experience in teamwork and managing software projects and their products. Programming Languages used: Ruby, SQL, HTML, CSS.

* **Java Programming**

This module introduces programming concepts through the Java programming language. Program design and the use of testing to drive program creation are also covered. Initial focus is placed on the structured aspects typical of many programming languages: the ideas of a sequence, selection and repetition. The object-oriented approach to building large software systems from components is then presented. Throughout the module, emphasis is placed on the practice of writing well-structured and readable programs to solve problems.

* **Devices and Networks**

The module consists of two parts. In the first, important elements of computer architecture are covered including digital logic, computer arithmetic and instruction set architecture. The approach in the module is to show how the basic elements of a computer are constructed and combined to give sophisticated architectures that support accelerated performance via cache memory and pipelining. The second half of the module shows how computing devices can be connected into networks, and covers the principles of layered protocols, error detection/correction and reliable transmission over networks.

* **Web and Internet Technology**

This module covers the basics of networks and internet workings, the Web in society, including information security and the technologies that are used in Web development, with an emphasis on building a simple interactive website using HTML, CSS and JavaScript.

* **Introduction to Algorithms and Data Structures**

This module introduces students to the design and analysis of efficient algorithms and data structures. Students learn how to quantify the efficiency of an algorithm and what algorithmic solutions are efficient. Techniques for designing efficient algorithms are taught, including efficient data structures for storing and retrieving data. This is done using illustrative and fundamental problems: searching, sorting, graph algorithms, and combinatorial problems such as finding shortest paths in networks.

* **Machines and Intelligence**

This module provides an introduction to Artificial Intelligence, and to key concepts and problems in the field, such as whether a computer is capable of understanding, and whether humans should themselves be viewed as machines. As well as providing a first encounter with the main issues that underlie attempts to create Artificial Intelligence, the module also has a more practical component that introduces algorithms and data structures for AI problem solving through practical programming examples, as well as hands-on experience with simple programming of robots. The emphasis here is on identifying the abstract nature of the problem which is to be solved, matching this to an appropriate algorithm or technique and implementing a solution. It also serves as an introduction to programming for research rather than for software engineering.

* **Foundations of Computer Science**

This module develops mathematical concepts and techniques that are of foundational importance to computing. It covers propositional and predicate logic, functions, relations, proof strategies, probabilities, modular arithmetics and linear algebra.