What is Software Engineering?

Software Engineering is the discipline providing methods and tools for the construction of **quality software** with a **limited budget** and a given **deadline**, in the context of constant requirements **change**.

The **IEEE** definition is: The application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software; that is, **the application of engineering** to software.

What does Software Engineering Involve?

It involves the elicitation of the system's **requirements**, the **specification** of the system, its architectural and detailed **design**. In addition, the system needs to be verified and validated, a set of activities that commonly take more than 50% of all development resources. **Testing techniques** and tools, at different levels (unit, integration, system) are needed. Software development being a human intensive process, **management and quality control** techniques are also required to run successful projects and construct quality systems.

Why is Software Engineering Important?

In most systems, including telecommunication systems, software is the **overriding component** in terms of cost and complexity. **Good software engineering practices and tools** can therefore make a substantial difference, even to the extent that they may be the driving force of the project success.

Why do Graduate Studies in Software Engineering?

Though a substantial body of knowledge exists in Software Engineering, a large number of issues are still open or in need of further research. Many companies, right here in Ottawa and in many other places, are eager to collaborate with us in undertaking such research projects. Research in software engineering tends to be applied, as we target concrete engineering problems.

The **gain of undertaking graduate studies**, whether at the Masters or Ph. D. level, can be described as follows:

- Gain an expertise that is very much in demand, both in industry and academia
- Gain an expertise that will give you a solid basis for a faster career growth
- Allow you to work in corporate R&D centers all over the world, that often require graduate degrees

It is usually easier to undertake graduate studies early on, after your undergraduate studies. Many people find it hard to go back to graduate school after a working experience, especially when they have financial and familial responsibilities.