Information Technology Fundamentals

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IT Discipline
Module 1: Part 2

Module 1. Main Objectives

- Review Computing Curricula
- Introduce Baccalaureate Degree Program for IT Engineering: Definition and Expectations
- Describe and Classify IT Professionals: Industry and Research Perspective

Contents

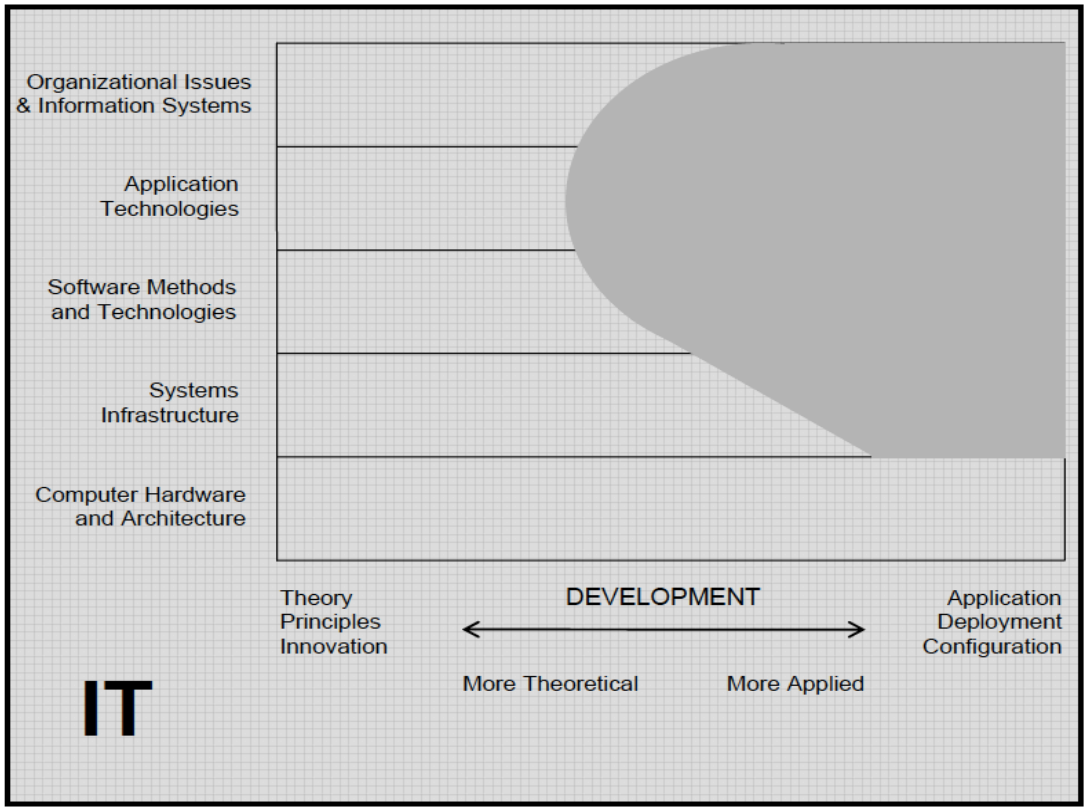
- IT Discipline: History and Definition
- Characteristics of an IT Graduate
- Research in IT

Let us Focus on Information Technology Engineering!

Information Technology

- Information technology is a label that has two meanings.
  1. In the broadest sense, the term information technology is often used to refer to all of computing.
  2. In academia, it refers to undergraduate degree programs that prepare students to meet the computer technology needs of business, government, healthcare, schools, and other kinds of organizations.

Information Technology



IT History

- ACM and IEEE Curriculum definition for computing *CC 2005: The Overview Report*

- Began in the Fall of 2001 with informal meetings between faculty in IT programs at a small number of institutions

- The first Conference on Information Technology Curriculum (CITC-1) Dec 2001
  1) A list of approximately 30 topics, with their related subtopics, that should be part of a 4-year education in Information Technology;
  2) A committee to work on curriculum issues;
  3) A committee to work on accreditation issues; and
  4) A parent organization (the Society for Information Technology Education, or SITE) for all people interested.

IT History

- Between 2001 and 2003, three more CITC conferences were held
- In July of 2003, SITE became SIGITE, the Special Interest Group for Information Technology Education, of the ACM.
- Draft criteria for accreditation were approved by SITE and were posted for public approval in the Fall of 2003
- Three IT programs were successfully accredited as general computing programs in 2005
- In October 2005, a draft of IT Curriculum Volume was posted on the ACM website for public comments.
- Comments were received and responded to until January 2007, when final feedback was received from the ACM.
- The final meeting of the writing committee included the steering committee and representatives from the 2-year curriculum committee and took place in Philadelphia, PA, in February 2008.

The Information Technology Discipline

1. The emergence of Information Technology as a discipline
   - Technical changes
   - Pedagogical changes
2. The role of Information Technology within the computing disciplines

Technical Changes

1. The World Wide Web and its applications
2. Networking technologies, particularly those based on TCP/IP
3. Systems administration and maintenance
4. Graphics and multimedia
5. Web systems and technologies
6. Service-oriented architecture
7. E-commerce technologies
8. Relational databases
9. Client-server technologies
10. Interoperability
11. Technology integration and deployment
12. Object-oriented event-driven programming
13. Sophisticated application programmer interfaces (APIs)
14. Human-computer interaction
15. Security
16. Application domains

Definition of Information Technology as an Academic Discipline (2005)

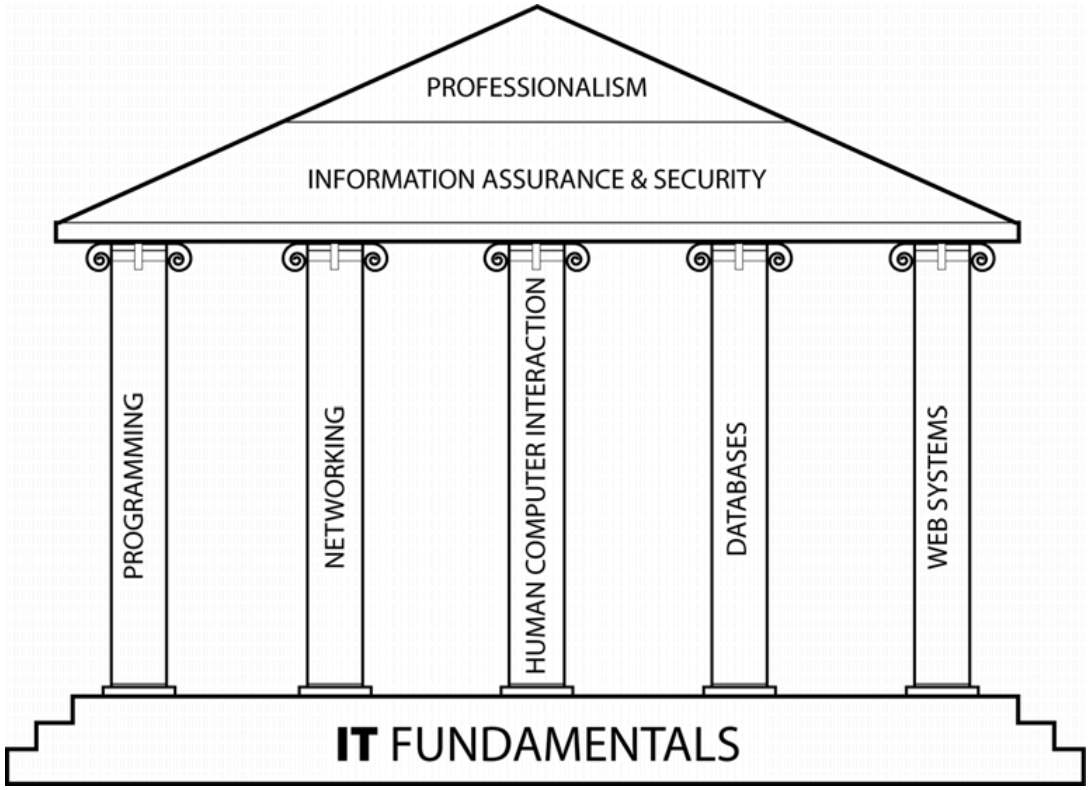
1) IT in its broadest sense encompasses all aspects of computing technology.

2) IT, as an academic discipline, is concerned with issues related to **advocating for users** and meeting their needs within an organizational and societal context through the **selection, creation, application, integration and administration** of computing technologies.

Broad Goals of an IT program

- Explain and apply appropriate information technologies and employ appropriate methodologies to help an individual or organization achieve its goals and objectives Function as a user advocate;
- Manage the information technology resources of an individual or organization;
- Anticipate the changing direction of information technology and evaluate and communicate the likely utility of new technologies to an individual or organization;
- Understand and, in some cases, contribute to the scientific, mathematical and theoretical foundations on which information technologies are built;
- Live and work as a contributing, well-rounded member of society.

IT Discipline



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Characteristics of an IT Graduate

- **An ability to apply knowledge of computing and mathematics appropriate to the discipline**
- An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
- An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
- **An ability to function effectively on teams to accomplish a common goal**
- An understanding of professional, ethical, legal, security and social issues and responsibilities
- **An ability to communicate effectively with a range of audiences**
- An ability to analyze the local and global impact of computing on individuals, organizations, and society

Characteristics of an IT Graduate

- Recognition of the need for and an ability to engage in continuing professional development
- An ability to use current techniques, skills, and tools necessary for computing practice
- An ability to use and apply current technical concepts and practices in the core information technologies
- An ability to identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems
- An ability to effectively integrate IT-based solutions into the user environment
- An understanding of best practices and standards and their application
- An ability to assist in the creation of an effective project plan

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Research in IT

- **Integration** - Many applications of computing technologies require the integration of different system components. Viewing systems broadly and including people as components of systems raises a host of integration issues.

- **Trade-off analysis** – Development of IT solutions inherently requires trade-off among approaches, processes, components, etc. Principles and methods for conducting this analysis are needed for successful IT practice.

- **Interface issues** – Integration of system components often results in problems at the interfaces. This is true whether the interfaces involve hardware, or software, or the interface from hardware and software to people.

- **Security and assurance** – Security and information assurance have risen sharply in importance in recent years. Since protection is only as good as the weakest point in the system, security and assurance present particular challenges in IT, where the scope of concern encompasses the total system

- **Implementation** - The introduction of an IT application in a user environment often changes that environment in subtle ways. Since many IT applications are designed for the user environment as it