Computer Science Department
cs.salemstate.edu

ITE 201 Fundamentals of Information Technology **3 cr.**

Catalog description:

This course is intended to provide students with an understanding of the discipline of Information Technology (IT), its relationship to other computing disciplines, and a set of fundamental skills necessary to IT specialists. The discussions include pervasive themes in IT, history of IT, IT and its related and informing disciplines, and IT application domains. It is also intended to help students understand the diverse contexts in which IT is used and the effect of IT on society as a whole. This course provides students with the fundamental terminology, concepts, abstraction patterns, and tools used by IT. Three lecture hours per week.

Prerequisite: ITE 101

Course Narrative:

This course lays the foundation of Information Technology (IT) discipline. Students will be able to identify the main components of an IT environment, the technologies that are used to build this environment, and what are the pillars on which IT discipline stands. Students will be guided through a series of topics starting with the history of IT, the current state of the IT discipline, and what are the demands of IT environments.

IT has various technical terms associated with it that need to be addressed and understood first. After attaining this objective it is possible to identify the main components of an IT environment and then develop the methods and technologies used in the creation of such an environment. Tightly integrated with these objectives is the analysis and application of assessment techniques that allow objective evaluation of IT environments. IT is an ever-evolving and ever-changing field of study and thus it is necessary to emphasize to students the need for life-long learning.

Green computing, cloud computing, human computer interfaces, and many other facets of IT that are becoming popular and represent the future of IT will also be introduced to students. This will directly address the objective of demonstrating knowledge of standards used in the creation of not only current but also futuristic IT environments.

Since security is one of the major components of all IT environments, the topics of legal issues, computer crime, copyright and intellectual properties, and privacy and civil liberties are presented at various stages as the course advances.

Goals:

Upon successful completion of the course, a student should be able to do the following:

G1: identify basic issues, problems, and solutions in designing and building an IT environment according to a set of requirements formulated by a client;
G2: describe the various elements (software and hardware) used in implementation of IT environments of different scales;

G3: use standards and protocols required to analyze and design IT environments;
G4: analyze components, tools, and organizational methods used by IT departments to ensure functionality (security, availability, reliability, etc.) of their IT environments;
G5: describe rules, regulations, legal issues, and documentation required in analyzing requirements, designing solutions, and implementing large scale IT environments.

Course Objectives:

Upon successful completion of the course, a student will have demonstrated the ability to:

O1: apply appropriate technical terminology when analyzing requirements, describing issues, and designing solutions for an IT environment according to given specifications;
O2: identify all the main components of an IT environment, explain methods and technologies that are used in the creation of such an environment, and apply these techniques in practice;
O3: analyze and apply assessment techniques that allow objective evaluation of IT environments;
O4: demonstrate knowledge of standards used in the creation of IT environments and the ability to use these standards when selecting components appropriate to an IT environment;
O5: analyze customer's requirements, formulate specifications for the entire IT infrastructure, and communicate (verbally and in writing) clearly and concisely these requirements to other people;
O6: work cooperatively with stakeholders and with members of IT groups in discussing characteristics of an IT environment, analyzing problems and solutions, and implementing solutions.

Program Objective / Course Objective matrix (For ABET Accreditation Purposes)

(The following Matrix maps the Program Objectives for Information Technology Program outlined by Accreditation Board of Engineering Technology (ABET) with the Course Objectives. The check marks below the course objective represent that those course objectives accomplish specific program objectives set forth by ABET. The program objectives that have a * in front of them means that that course does not address those program objectives.)

Program Objective	**O1**	**O2**	**O3**	**O4**	**O5**	**O6**
PO-A: An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline.	✓					
PO-B: An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.	✓	✓		✓		
PO-C: An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.	✓	✓	✓	✓		
PO-D: An ability to function effectively on teams to accomplish a common goal.						✓
PO-E: An understanding of professional, ethical, legal, security and social issues and responsibilities.						✓
PO-F: An ability to communicate effectively with a range of audiences.	✓			✓	✓	✓

Program Objective	O1	O2	O3	O4	O5	O6
PO-G: An ability to analyze the local and global impact of computing on individuals, organizations, and society.					✓	✓
PO-H: Recognition of the need for and an ability to engage in continuing professional development.	✓	✓	✓	✓	✓	
***PO-I:** An ability to use current techniques, skills, and tools necessary for computing practice.						
PO-J: An ability to use and apply current technical concepts and practices in the core information technologies.	✓					
PO-K: An ability to identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.		✓	✓		✓	✓
PO-L: An ability to effectively integrate IT-based solutions into the user environment.		✓	✓	✓		
PO-M: An understanding of best practices and standards and their application.				✓	✓	✓
***PO-N:** An ability to assist in the creation of an effective project plan.						

Topics:

The column on the right hand side represents the Body of Knowledge and number of hours (in parenthesis) set forth by ABET accreditation board for accomplishing minimum required hours assigned for different categories. More information on this body of knowledge can be found in Appendix A "The IT Body of Knowledge" on Page 68 of the following document.
http://www.acm.org//education/curricula/IT2008%20Curriculum.pdf

- What is Information Technology (IT) — ITF1(4), ITF2(2), ITF3(1)
  - Definition and goals of IT
  - Distributed nature of IT environment
  - Components, methods, and tools used by IT
  - IT best practices and standards
  - History of IT (technical and social aspects)
  - Related and Informing Disciplines
- IT as profession — ITF3(1), ITF4(1)
  - Layered structure of IT body of knowledge
    - Engineering vs. Administrative vs. User
  - Expertise and responsibilities of IT professionals
  - Application domains of IT and its affect on society
- IT Systems model, its elements and components — HCI1(1), IAS1(1), IM1(1), ITF1(3), NET6(1), PT3(1), WS1(1), WS2(1)
  - IT Systems Model, Data vs. Information, Hardware and Software components
  - Architecture, components, and control and data flow in a generic IT environment

    - Data storage architectures and databases
    - Communication and Networking technologies
    - Information assurance and security
    - Web Systems
    - Importance of Human-Computer interaction for IT
    - IT administration as a major factor
- Building an IT environment up to a specification — ITF1(2), SA4(1), SIA6(1)
    - Top-down and bottom up system analysis
    - Requirements analysis and planning
    - Environment architecture design, implementation, management, and maintenance
- Technological progress and changing IT environment — ITF1(2)
    - Sampling technological change of IT
    - Necessity of life-long learning and professional development
- Future of IT and its workforce — ITF1(3)
    - Cloud and Grid
    - Human Computer interface
    - Green Computing
    - Pervasive computing
    - Personal Information Universe
    - Ubiquitous secure access
    - Skills and careers
- Professional issues — SP1(3), SP2(2.5), SP7(1)
    - Communications and teamwork
    - Responsibilities of IT personnel
    - Professional growth and learning cycles
    - Professional and Ethical issues and Responsibilities
- Social issues — SP4(2), SP5(2), WS6(1)
    - Legal issues and computer crime
    - Copyright and intellectual properties
    - Privacy and civil liberties
- Organizational context of IT — SP6(2)
    - Scalability of an IT environment (technical and organizational)
    - IT as a backbone of business

This course is an introduction to IT as a profession. Its emphasis is on the thorough understanding of IT as a discipline. Its purpose is to introduce students to basic components of IT and make them aware of areas of knowledge IT specialists must possess (computer architecture, principles of software, networking and Web, computer security, databases, etc.) The course acquaints students with the basic set of skills necessary for an IT specialist such as analyzing customer requirements, and then designing, creating, and managing an IT environment that satisfies these of requirements. Students will be made aware of social, legal, and personal issues brought in by pervasive nature of IT, the role it plays in the society, and its future - technologies, capabilities, and its effects on the society.

Student Experiences:

Organization of the course

The course consists of lectures, in-class exercises, homework assignments, quizzes, and two exams – a midterm and a final. In addition to the textbook, Internet resources are widely used during the course by the instructor as well as students.

In-class exercises

In-class exercises may consist of:

- Discussions of the material presented during the lecture
- Analysis of components used to create IT infrastructures, their characteristics and properties
- Exercises in using tools that belong to an IT professional toolbox

Group discussion time and presentations will be scheduled as a part of lectures to ensure student's involvement and active participation in the process.

Assignments

Homework assignments, given weekly, will exercise theoretical principles discussed during the lectures through practical exercises. Assignments require students to use information given during the lectures and textbooks, and perform Internet research for necessary materials. Regular writing assignments include but are not limited to:

- review of textbooks and related Internet materials as a part of research assignments;
- discussing and proposing solutions for constructing proper IT infrastructures;
- analysis of requirements and written presentations of research findings;

Specific requirements for each assignment will be stated when the assignment is distributed; all written submissions will be graded against the Writing rubric. Presentations will be assessed based on the Presentation rubric.

Other than the Homework Assignments, there will be quizzes, projects, midterm, and a cumulative final. Quizzes will be given based upon the topics covered in previous class(s).

Grading

Final grades will be determined on the basis of the following approximate weights:

- Homework assignments, Quizzes, in-class exercises, Projects 60%
- Midterm exam 20%
- Final exam 20%

Student Experiences by Course Outcome (Objective) matrix:

	O1	**O2**	**O3**	**O4**	**O5**
In-class exercises	✓	✓	✓	✓	✓
Homework assignment	✓	✓	✓	✓	
Quizzes	✓		✓		
Midterm exam	✓	✓	✓		
Final Exam	✓		✓	✓	✓

Tools and Web resources:

- http://wikieducator.org/Introduction_to_Information_Technology
- http://www.openbookproject.net/courses/intro2ict/
- http://my.safaribooksonline.com/book/information-technology-and-software-development/9788131760291
- http://pages.uoregon.edu/moursund/Books/ICT/ICTBook.pdf
- http://quizlet.com/6335465/chapter-1-introduction-to-information-technology-hardware-software-and-telecommunications-flash-cards/
- http://www.myenglishpages.com/site_php_files/vocabulary-lesson-information-technology.php
- http://theinterpretersfriend.org/tech/vocab/vl/computers.html

Bibliography:

- Rainer, R. Kelly; Cegielski, Casey G.; Prince, Brad. **Introduction to Information Systems**. Fifth Edition. Wiley, 2014.
- Walters, E. G. **Essential Guide to Computing: The Story of Information Technology**. Prentice Hall PTR, 2001
- Cyganski, D. **Information Technology: Inside and Outside**. Prentice Hall, 2000
- Bharihoke, D. **Fundamentals of Information Technology**. Fourth Edition. Excel books, 2012
- Leon, A. **Fundamentals Of Information Technology**. Second Edition. Vikas Publication House, 2009
- Rajaraman, V. **Introduction to Information Technology**. Second Edition. PHI Learning Pvt. Ltd., 2013
- Davis, C.H.; Shaw, D. **Introduction to Information Science and Technology**. Information Today, 2011
- Turban, E. **Introduction to Information Technology**. Third Edition. Wiley, 2003