
SYLLABUS

Date/ Revision 23 May 2015

Faculty Engineering

Approval

SUBJECT : FUNDAMENTAL OF COMPUTER SCIENCE

1. Identification of Subject:

Name of Subject : Fundamental of Computer Science
Code of Subject : FCSC-1000
SKS / ECTS : 2/ 3
Semester : 1
Study Program : All Study Programs.
Lecturer : Dipl.Ing. Maralo Sinaga / Dr. Ir. Rusman Rusyadi, MSc.

2. Competency

After having the course, students are expected to:

- Formulate problems and present solutions to them
- Understand how computers can be used to solve problems and tasks
- Understand how different areas of Computer Science relate to each other to create solutions to problems
- Use control structures of a programming language to code algorithms
- Understand the fundamentals of computer systems
- Prepare an oral and written presentation about a topic in Computer Science
- Write algorithms using different techniques, as flowcharts, pseudo codes and a high level language

3. Description of Subject:

This course introduces standard fundamentals of computer hardware and software; IT tools as well as fundamental applications of Information Technology in today's activities. The course provides an introduction to basic concepts of information, information systems and the "Information Age", and also provides an overview on the creation, organization, analysis, storage, retrieval, and communication of information. Students will develop an understanding of basic computing and information systems principles and the social implications of information and information technology. In this course the following major topics are covered:

- The "Information Age" and the role of information in knowledge work
- Information systems and information technologies
- Planning for and developing information systems
- Personal information and information technology skills

These topics through in-class presentations, exercises discussions (both face-to- face and online), readings (from both text and on-line sources), exercises (both individual and group-based), and a variety of graded assignments and tests.

4. Learning Approach

Approach : Combination of Expository - inquiry and collaborative
 Method : Discussion, question answer, sample problem, group work
 Student Task : Home work, presentation
 Media : LCD projector, film.

5. Evaluation

a) Absence maximum : 25%
 b) Participation in discussion : 5 points
 c) Homework, Classwork : 5 points
 d) Presentation, Simulation : 10 points
 e) Daily Quiz : 20 points
 f) Final Examination : 60 points

Total : 100 points

6. Contents/ Topics of Lecturing:

Week	Content/ Topics of Lecturing	Text Book Chapter	Remark
1	Digital Literacy: Introducing a World of Technology: <ul style="list-style-type: none"> • World of Computer, the Components of Computer • Advantage and Disadvantage of Using Computers • Network and Internet • Computer Software: OS and Application SW • Categories of Computers: PC, Laptop / Notebook / Servers /Mainframe • Element of Information System • Computer in the Society 	Ch1	
2	The Internet: <ul style="list-style-type: none"> • The Internet and the World Wide Web • Accessing, Searching, Sharing, and Communicating. • Connecting to the internet; • Types of websites; • Media on the Web; • Other Internet Services 	Ch2	

3	Computers and Mobile Devices: <ul style="list-style-type: none"> • Desktop and Mobile Computers • Terminals, Servers, Supercomputers, and Embedded Computers; • Cloud Computing; • Mobile Devices, Game Devices; • Ports and Connections; • Health concerns of using Technology 	Ch3	Quiz
4, 5	Programs and Apps: Using Software at Work, School, and Home: <ul style="list-style-type: none"> • Programs and Apps: The role of Operating System • Application Software: Business SW, Graphics and Multimedia SW, Software for Home, Personal and Education Use; • Application Software for Communications; • Security Tools, File and Disk Management Tools 	Ch4	
6	Digital Safety and Security: Identifying Threats, Issues, and Defenses: <ul style="list-style-type: none"> • Digital Security Risk • Internet and Network Attacks; • Unauthorized Access and use; • Software theft and Information thefts; • Hardware thefts, vandalism, and Failure; • Backing Up – the Ultimate Safeguards; • Wireless Security; • Ethics and society • Information Privacy 	Ch5	Quiz
7, 8	Student Presentations: <ul style="list-style-type: none"> • Presenting a topic chosen by the students. 		
9	Inside Computers and Mobile Devices: Exploring the Computers: <ul style="list-style-type: none"> • Motherboards, Processors • Memory: RAM, Cache, ROM, Flash Memory, CMOS and access time; • Data Representations; • Cloud Computing; • Adapters, Busses, power supply and Battery. 	Ch6	Quiz
10	Inputs and Outputs: Examining the Popular Devices: <ul style="list-style-type: none"> • Input Devices: Keyboard, Pointing Devices, Touch Screens, Pen Input, Motion Input, Voice input, video input, scanner and reading devices; • Output Devices: Displays, Printer, Speaker / Headphone 	Ch7	
11	Digital storage: Preserving on Media and in the Cloud: <ul style="list-style-type: none"> • Storage, Hard disks, Flash Memory, optical Discs; • Cloud storage, 	Ch8	

	<ul style="list-style-type: none"> Enterprise Storage, Other memory types 		
12	<p>Operating Systems: Managing, Coordinating, and Monitoring Resources:</p> <ul style="list-style-type: none"> Operating systems and function; Type of Operating Systems; PC/Laptop/Notebook and Desktop OS, Smartphone OS, and Server OS 	Ch9	
13	<p>Communications and Networks: Sending and Receiving Digital Content:</p> <ul style="list-style-type: none"> Communication Standard protocols; Communication Software; Communication -Lines and –devices. Home Network, Transmission Media, Wireless transmission Media 	Ch10	
14	<p>Information and Data Management:</p> <ul style="list-style-type: none"> Organizing, Verifying, Maintaining, and Accessing.; Database, Data, and Information; File Processing vs. Database. Database Management System, Transmission Media, Wireless transmission Media 	Ch10	
15	Final Examination		

7. Book Reference:

a) **Main Text Book:** *“Discovering Computers - 2014, Technology in a world of Computers, Mobile Devices, and the Internet”*, **Authors: Misty E. Vermaat** Purdue University Calumet, **Publisher:** Delmar, Cengage Learning, **ISBN-13:** 9781285161761.

b) **Supplement Textbooks:**

- “Foundations of Computer Science”, Author: Behrouz Forouzan, Firouz Mosharraf, Publisher: Longman; ISBN: 0 582 50720 0.
- “Discovering Computers: Fundamentals, Fifth Edition”*, **Authors:** Gary B. Shelly & Misty E. Vermaat, **Publisher:** Delmar, Cengage Learning, **ISBN-13:** 978-1-4239-2702-0.