

SYLLABUS:

Date / Revision April 2017/September 2017/IT
Faculty Engineering
Study Program Computer Science

SUBJECT: COMPUTER SCIENCE & SYSTEM DESIGN1

1 Basic Information

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| 1.01 | Subject Name | COMPUTER SCIENCE & SYSTEM DESIGN1 |
| 1.02 | Semester | 5 |
| 1.03 | Level | 1 |
| 1.04 | SKS | 2 |
| 1.05 | Mandatory / Curriculum | D-05 |
| 1.06 | Subject Code | CSSD |
| 1.07 | Subject Code | CSE-D-CSSD-117 |
| 1.08 | Year | 2017 |
| 1.09 | Quality Control | Final Test, see evaluation |
| 1.10 | Limitations | Min 12 and Max 32 students in one class |
| 1.11 | Combined with | |
| 1.12 | Perquisite | |
| 1.13 | Responsible | |
| 1.14 | Revision | September 2017 |

2 Description of Subject

The goal of this course is to provide knowledge about design and analysis of computer systems, based on the requirements of a client. The course combines theoretical background for the process of building new systems with practical design exercises. The course will employ all the method of system analysis and applications such as cloud and mobile computing. Student may be exposed to traditional structured analysis and new object oriented approaches

3 Objectives

To lead the student about the process of design and the application of system development in a real life, especially computer system.

4 Competency

To be able to integrate their previous knowledge in computer science body of knowledge such as computer architecture, operating system, programming language, networking, etc
To be able to design a computer system including implementation and its application on a specific purposes like device controller, high speed data processing, telemetry, etc.

5 Learning Approach / Methodology

- Lectures/ Class contact (time-tabled) supplemented with interactive questions and answers;
- Student Study Effort: homework/assignment; preparation for test/quizzes/ examination.

6 Evaluation

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| 5.1 | Absence maximum | 25% |
| 5.2 | Participation in Discussion | 05 Points |
| 5.3 | Homework / Classwork | 05 Points |
| 5.4 | Presentation /Simulation | 10 Points |
| 5.5 | Daily Quiz | 20 Points |
| 5.6 | Final Examination | 60 Points |
| | Total | 100 Points |

7 Text Book and Reference

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| 1 | <p>Main Text Book:</p> <ul style="list-style-type: none"> • Systems Engineering Principles And Practice, Second Edition, Alexander Kossiakoff, et. al., John Wiley & Sons, 2011, ISBN 978-0-470-40548-2 • Principle of Computer System Design, Jerome H. Saltzer and M. Frans Kaashoek. Morgan Kaufman, 2009, ISBN: 978-0-12-374957-4 |
| 2 | <p>Supplement Textbooks:</p> <ul style="list-style-type: none"> • Systems Analysis And Designin A Changing World, John W. Satzinger, et al. Course Technology, Cengage Learning, 2012, ISBN-10: 1-111-53415-2 |

8 Content / Topics of Lecture

| Week | Content/Topics of Lecturing | Text Book Chapter | Remark |
|------|--|-------------------------|--------|
| 1 | <p>Introduction :Rule Of The Projects, General System Design, Deliverable</p> <p>SYSTEMS ENGINEERING LANDSCAP : Systems Engineering Viewpoint, Perspectives of Systems Engineering , Systems Domain, Systems Engineering Fields, Systems Engineering Approaches, Systems Engineering Activities and Products</p> | Kossiakoff Ch 2. | |
| 2 | <p>System Design :Review Of System Design Approach, Traditional & Agile</p> <p>THE SYSTEM DEVELOPMENT PROCES: Systems Engineering through the System Life Cycle , System Life Cycle, Evolutionary Characteristics of the Development Process, The Systems Engineering Method , Testing throughout System Development</p> | Kossiakoff Ch 4. | |
| 3-4 | <p>Presentation Phase 1 : Design Intention (User Story), Project Management, System Architecture(Technology Selection), Mathematical And Algorithm, Risk Assessment</p> | | |
| 5 | <p>NEEDS ANALYSIS: Originating a New System, Operations Analysis, Functional Analysis, Feasibility Definition, Needs Validation, System Operational Requirements</p> <p>CONCEPT EXPLORATION: Developing the System Requirements, Operational Requirements Analysis, Performance Requirements Formulation, Implementation of Concept Exploration, Performance Requirements Validation</p> | Kossiakoff Ch .6 & 7 | |
| 6 | <p>CONCEPT DEFINITION: Selecting the System Concept, Performance Requirements Analysis, Functional Analysis and Formulation , Functional Allocation, Concept Selection, Concept Validation, System Development Planning, Systems Architecting, System Modeling Languages: Unified Modeling Language , Model-Based Systems Engineering (MBSE), System Functional Specifications</p> | Kossiakoff Ch .8 | |
| 7 | <p>Presentation Phase 2 : User Requirement, System Requirement, System Specification</p> | | |
| 8 | Midterm Break | | |

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| 9 | STRUCTURE OF COMPLEX SYSTEMS: System Building Blocks and Interfaces, Hierarchy of Complex Systems, System Building Blocks, The System Environment, Interfaces and Interactions, Complexity in Modern Systems | Kossiakoff Ch 3. | |
| 10 -11 | Presentation Phase 3: System Building Block, System Architecture | | |
| 12 | Performance fine tuning :Memory management, process threading, interfacing and protocol, data losses etc INTEGRATION AND EVALUATION: Integrating, Testing, and Evaluating the Total System, Test Planning and Preparation, System Integration, Developmental System Testing, Operational Test and Evaluation | Kossiakoff Ch 13. | |
| 13 - 14 | Final Presentation :System Solution Final | | |
| 15 | Final Examination | | |