**Approved by: Head of Department**

**PhD. Eljona Proko**

**COURSE PROGRAM**

**CS 337, Software design**

**Lecturer:** Nirida Pashaj, Lecturer, Master of Science.

**Hours:** 8 credits, 3 lec / 2 sem

**Typology:** Characterizing subject

**Academic year / semester:** 2019/ Fall

**Type of course:** Mandatory

**Study program:** Bachelor in Computer Science

**Course code:** CS 337

**The electronic address of the lecturer:** [niridapashaj@gmail.com](mailto:niridapashaj@gmail.com)

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**SUMMARY AND LEARNING RESULTS:** The course aims at giving students a general vision of software design starting from its specifications, design and management through a panoramic subject approach, and provides a more tool to help students deepen their knowledge, update them over specific arguments such as demand engineering, reliable system development, and improved processes through sophisticated practical examples.

**Basic Concepts:**

1. Introduction to software design. Design of software and system. Software processes. Software Engineering Methods.

2. Architectural Systems. Types of processes. Critical software systems.

3. Software Process Models.

4. Project Management. Structured language specifications.

5. Extraction and analysis of requirements.

6.Modeling the behavior of objects. Summary of objects.

7. Formal specification of critical systems.

8. Control Styles, Centralized Control.

**Lectures Topics:**

**Topic I–** Introduction to software design. Design of software.Software processes. Software Engineering Methods, CASE, Challenges Faced with Software Engineering. Computer-based Systems Engineering, Design of Emergency Systems P.1-10.

**Topic II–** Architectural Systems, Types of Functional Components, Types of Processes. Critical Software Systems, System Types, Availability, Reliability, Security, Protection. Software Processes: Understanding Software Processes. p.11-23

**Topic III–** Software Process Models, Dataflow, Model of Evolutionary Development, Component-based Modeling. Cycle Process Models, Engineering Requirements, Design and Implementation Process, Software Evaluation. System Evolution, CASE Technology. p.24-39

**Topic IV–** Project Management, Barcharts and Network Activities, Risk Management, Risk Identification, Risk Analysis, Risk Planning. Demonstration and Demand Analysis, View Point Oriented, Scenarios, Interviews, Ethnography. p.40-50

**Topic V–** Structured language specifications, Specification of applications using PDL, Interface specification. Project Management, Barcharts and Network Activities, Risk Management, Risk Identification, Risk Analysis, Risk Planning. Demolition Engineering Processes, Opportunity Study. P.51-68

**Topic VI–** Demonstration and Demand Analysis, View Point Oriented, Scenarios, Interviews, Ethnography. Appraisal of Referrals, Review of Referrals. p. 69-84

**Topic VII–** System Templates, Contextual Models, Behavioral Models. Data-flow model, state machine model, data model. System Templates, Templates with Objects, Retained Patterns. P.85 -95

**Topic VIII–**  Object Summary (Aggregate Model), Modeling of Object Behavior, Structured Methods Formal Specification of Critical Systems, Risk-Specific Specifications, Risk-Tree Analysis, Risk Identification. Analysis and classification of risks. P.96-104

**Topic IX–** Formal Specification of Critical Systems, Specification of Security, Specification of Protection. Confidence Specification, Measurement of Reliability, Non-Functional Reliability Requirements. Formal Specifications, Subsystem Interface Specification, Behavioral Specifications. p.105-109

**Topic X–** Architectural Design, Architectural Design Decisions. System Organization, Repozitory Model, Client - Server Model. Modular decomposition styles, Object oriented decomposition, Function oriented pipelining. p.110-116

**Topic XI–** Software Engineering based on Replacement Components, Reuse Models for System Development, Components and Their Models, Development of Reuse Components, CBSE Processes, Joining Components. Critical Systems Development, Credible Processes, Trusted Programming, Protected Information, Safe Programming, Exception Management. P.117-125

**Topic XII –** Control Styles, Centralized Control, Event-driven Systems. Reference architecture. Distributed Systems Architecture, Multiprocessor Architecture. Client-server Architecture, Distributed Architecture Arrangements, CORBA. p.125-137

**Topic XIII**–Software Testing and Evaluation, Soft Inspection, Static Automatic Analysis, Verification and Formal Methods. People and Cost Management, Staff Selection, Group Motivation and Management, Productivity of Software, Valuation Techniques, Algorithmic Cost Modeling.

**Topic XIV –** Quality Management. Quality of Process and Product, Quality Control, Merck and Quality Measurement Methods. Calculation of distributed inter-organizational pg.163-177

**Topic XV–** P2p architecture. Architecture of systems oriented by the services p. 178-189

**Topic IX–**Introduction in PHP. Syntax, Variables, Operators. Data types in PHP.

**Topic X–**Conditional statements in PHP. Strings, and string built-in functions. Functions and code moduling.

**Topic XI–**Browser communication. Arrays in PHP.

**Topic XII –**Working with files in PHP. Sessions and Cookies. p.

**Topic XIII**–E-mail sending.

**Topic XIV –** Web site evaluation.

**Topic XV–** Publishing Web sites.

**Seminars Topics:**

**Topic I–** Designing Systems: A Case Study of Windows Software System

**Topic II**- Determining the types of requirements.

**Topic III** critical systems, eg analysis study of a software system.

**Topic IV** The life cycle of a developed software.

**Topic V** - Designing Demand Processes.

**Topic VI**- Case studies in system design.

**Topic VII** - System Templates: Designing a database management system.

**Topic VIII** - Modular decomposition styles, case study of the architecture of a real-time system (anti sneezing system).

**Topic IX**- Object-Oriented Design.

**Topic X**- Examples of class diagrams in UML.

**Topic XI** - Organization of the system, Repozitory model, Client - server model.

**Topic XII** - Control Styles, Centralized Control, Event-driven Systems.

**Topic XIII** - Distributed Systems Architecture, Multiprocessor Architecture.

**Topic XIV** - Arranged Architecture, CORBA.

**Topic XV** - Architecture of systems oriented to services.

**STUDENT EVALUATION FORMS**

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| --- | --- |
| Control | Percentage evaluation |
| Control I | 25% |
| Annual evaluation | 15% |
| Final control | 60% |

Evaluation of students is done based on Percentage evaluation conversion; grade 5-10 progressively 41- 100% Student, resulting in less than 75% attendance for the period that belongs to the partial exam, period in which will be tested, will not be introduced in the respective exam, will be evaluated with M. If a student has attended the course, but is not present in the exam will be estimated NP (Not Present).

**Course format:**

The course will be evaluated on the basis of a partial exam, assignments and final exam. Points received will be cumulative. Exams will not be repeated, for any reason. If you will miss an exam without a major reason, then you will lose points for that examination in which you did not attend.

**TEXT BOOK**

**Basic Literature**:

-Software Enginnering, 7 edition, Ian Sommerville

-Foundamental of Software Engineering, 2nd edition, Ghezzi, Jazayeri,

-www.software-engin.com

-Inxhinieria software: leksione ne shqip ne trajte elektronike

**CONCLUDING REMARKS FROM LECTURER**

If you have any problem or question, please send e-mail with the subject "CS 337". E-mail may take a few days to respond. Enter the subject "Urgent CS 337" if your problem is urgent and cannot wait. Students are invited to not send e-mail relating to the course without the subject: CS 337. Before the students make a question, make sure that this information was not found in the official website of UV. Students are not invited to make questions through e-mail about course content because is better to answer them in the auditor, in the presence of other students. Before students ask a question, make sure this information is not found on the course website: https://sites.google.com/site/niridapashajuv11 .

**Email**: Every student is obliged to regularly check e-mail. Different tasks and notifications will be made only by e-mail.

**Code of honesty**: Not permitted to work in groups for homework, as they are individual. Also not allowed to copy in.