Brooklyn College
Department of Computer and Information Science

CISC 3140 [20.2] Design and Implementation of Software Applications 2
3 hours, 3 credits

Continuation of CISC 3120 [20.1]. Emphasis on building and testing a system designed and prototyped in CISC 3120 [20.1]. Emphasis on software development, database systems, intelligent systems and software engineering. This course should be taken the semester after CISC 3120 [20.1].

Objectives

Students will be able to:

1. Develop and test programs for real-world situations.
2. Integrate knowledge from a variety of sources to formulate a design for a multi-faceted, interactive, web-based computer system and implement it.
3. Analyze issues involving development and use of computing in modern society.
4. Demonstrate effective work on a team or in a working group.
5. Describe technical work orally and in writing.

Syllabus

Unit E. Software Development	
Week 1	Software Tools and Environments.
Week 2	Software Project Management.
Unit F. Database Systems	
Week 3	Information Models and Systems.
Weeks 4-5	Database Systems.
Weeks 6-7	Data Modeling.
Unit G. Intelligent Systems	
Week 8	Fundamental issues in Intelligent Systems.
Weeks 9-10	Search and Constraint Satisfaction.
Week 11	Knowledge Representation and Reasoning.
Unit H. Software Engineering	
Week 12	Software Processes and Evolution.
Weeks 13-14	Software Validation.

Method of Assessment

1. Students will design and implement a graphical user interface and its underlying behavior that reacts to user input in a friendly way, including the handling of errors robustly.

2. Students will modify an animated graphics program. They will be provided with a working example, and they will have to design, implement and test a small modification to the program.

3. Students will modify an Internet-based client-server program. They will be provided with a working example, and they will have to design, implement and test a modification to the program that meets a set of given design criteria.

4. Students will design and implement a small database system. They will create queries that act on that database system, and they will implement those queries both from a command-line SQL interactive interface and from a web-based, browser-friendly database query language.

5. Students will modify an intelligent game-player. They will be provided with a working example of an automated game player and the game environment in which the player acts. They will be given goals for improving the performance of the player, and they will be required to design, implement, test and document a solution that meets the given goals.

6. Students will document their software design and methodologies for each program and/or project.

7. Students will design and implement a large final project in the second of the two courses, integrating concepts from multiple areas. They will be required to create documentation for the project. They will be required to fully test their project and submit a working program.

Bibliography

The Design of Everyday Things, by Donald Norman. BasicBooks (2002).

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Introduction to Computer Graphics, by James D. Foley, Andries van Dam, Steven K. Feiner, John F. Hughes, and Richard L. Phillips. Addison Wesley (1993).

The Java Tutorial: A Short Course on the Basics (4th edition), by Sharon Zakhour, Scott Hommel, Jacob Royal, Isaac Rabinovitch, Tom Risser and Mark Hoeber. Prentice Hall PTR (2006).

Programming with Java, by Barry Holmes. Jones and Bartlett Publishers (1998).

Computer Networking with Internet Protocols, by William Stallings. Prentice Hall (2004).

Understanding Unix/Linux Programming, by Bruce Molay. Pearson Education, Inc. (2003).

Core PHP Programming, by Leon Atkinson. Prentice Hall PTR (1999).

The Mythical Man-Month, by Frederick P. Brooks, Jr. Addison-Wesley Publishing Co, Inc., Anniversary Edition (1995).

Object-Oriented and Classical Software Engineering (7th edition), by Stephen R Schach. McGraw-Hill Science/Engineering/Math (2006).

An Introduction to Database Systems (8th Edition), by C.J. Date. Addison Wesley (2003).

Artificial Intelligence: A Modern Approach (2nd edition), by Stuart J. Russell and Peter Norvig. Prentice Hall (2002).