

Polytechnic University of Puerto Rico
Department of Electrical Engineering
Master in Electrical Engineering

Course Syllabus

Title : Software Engineering I

Code : EE 6510

Credits : Three (3) Credits

Duration : One academic trimester

Schedule : Forty-five contact hours per course

Prerequisites : None

Description

The course covers basic concepts of software requirements generation and analysis, software design, implementation, maintenance, structured design methodologies, object-oriented design methodologies, and data flow design. Project development and team software, budgets and computer ethics issues are also discussed. Students practice the analysis and design phases for a system and the required testing techniques. Various system development models are presented.

Justification

With the advent of the Information Society one of the major sources of value is the intellectual capital generated as a result of investment in software development. Software engineering thus represents the custodian of the tools and techniques for assuring the productivity of the capital investments in this increasingly important area. The increasing scope of the projects undertaken by software development teams gives rise to an exponentially growing complexity that necessitates explicit techniques to enhance controllability and manageability. The need for intellectual capital preservation requires of new techniques to facilitate the development of reusable software components, and their integration at an ever higher level of abstraction.

Using the Systems Development Life Cycle (SDLC) method as a foundation, this course will prepare the student to perform the major activities involved in analyzing and designing software systems. These activities include planning, analysis, design, implementation, and support.

Objectives

1. Understand the source of complexity in software development.
2. Concepts of Software Development Life-Cycle
3. To review strategies for developing information system applications.
4. Understand the major software development processes such as user requirements specifications, functional software specifications, algorithm selection, coding, testing, validation, verification, maintenance, and retirement.
5. To present the development life cycle as a basic concept for managing and controlling application development. To present alternative development approaches.
6. Understand the major life-cycle models including, Waterfall Model, Object Oriented Development Model, Spiral Model, Extreme Programming, and others.
7. To examine both group dynamics and individual behavior in the development process.
8. Understand Software Development metrics and models, such as LOC, software error rates, COCOMO, coupling, and cohesiveness.

Course Outline

1. Why Software Engineering?
2. Project Planning
3. Requirements Analysis
4. System Design
5. Program Design
6. Program Implementation
7. Program Testing
8. System Testing

Required Textbooks

Software Engineering: A Practitioner's Approach 5th edition (2000)

by Roger S. Pressman

McGraw-Hill Higher Education

ISBN: 0073655783

Grading Testing

Final course grade will be determined based on the following scale:

100 - 90	A
89 - 80	B
79 - 70	C
69 - 60	D
59 - 0	F

Course History

April 1, 2002
May 25, 2002

Bibliography

Mastering the Requirements Process 1st edition (2000)

By Suzanne Robertson, James Robertson

Addison-Wesley Pub Co

ISBN: 0201360462

Software Engineering Classics: Software Project Survival Guide/ Debugging the Development Process/ Dynamics of Software Development (1998)

By Steve Maguire, Microsoft Press

ISBN: 0735605971

The Information System Consultant's Handbook: Systems Analysis and Design (1998)

By William S. Davis, David C. Yen

CRC Press

ISBN 084370019

Modern Systems Analysis and Design (1998)

By Jeffrey A. Hoffer, Joey F. George, J. S. Valacich

Addison Wesley

ISBN 0201338416

Systems Analysis and Design (1998)

Kendall & Kendall

Fourth Edition

Prentice Hall

ISBN 0136466214

The Art of Analysis (1997)

By Arthur M. Langer

Springer Verlag

ISBN 0387949720

Cases for Modern Systems Analysis and Design (1996)

By Annette Easton, George Easton

Addison Wesley

ISBN 0805325166

Creating a Software Engineering Culture (1996)

By Karl E. Wiegers

Dorset House

ISBN: 0932633331

Software Engineering Fundamentals (1996)

Behforobz, Ali / Hudson, Frederick J.

Oxford University Press, Inc.

*A Discipline for Software Engineering (Sei Series in Software Engineering)
(1995)*

by Watts S. Humphrey

Addison-Wesley Pub Co