Course:	**SOFTWARE METRICS AND QUALITY ASSURANCE (CSc 840)**
Instructor:	Dr. Jozo J. Dujmović (English spelling: Yozo Dooymovich) Office: Thornton 946, Tel. (415) 338-2207, E-mail: jozo@cs.sfsu.edu
Objectives:	The goal of this course is to present the areas of software measurements, modeling, and quality assurance, and to prepare students for research projects in this area.
Prerequisite:	CSc 640/848 (Software Engineering) or consent of instructor.
Contents:	Introduction to SW metrics and SQA. Quality activities in the project life cycle. Measurements and modeling in software engineering. Software metrics data collection and analysis. Measurement of lines of code, execution time, processor and memory utilization. Compiler performance analysis. Program generators. Size metrics, data structure metrics, logic structure metrics, software science composite metrics, effort and cost metrics. Effort, productivity, and software cost assessment models (COCOMO). Functional metrics. Software metrics in managing quality. Strategy and implementation of testing. Software reliability and defect models. Software quality standards, certification, and assessment (ISO 9001, ISO 9000-3, CMM. CMMI, ISO/IEC 9126, IEEE 12207, IEEE 1012, IEEE 1028, and IEEE 1061: IEEE Standard for a Software Quality Metrics Methodology). Quantitative models for software evaluation and comparison based on the LSP method. Design of system requirement trees, elementary criteria, and preference aggregation structures for evaluation of software systems. Software quality models based on usability, integrity, efficiency, correctness, reliability, maintainability, testability, flexibility, reusability, portability, and interoperability. Design and use of software metrics tools.
Grading:	This course is entirely project-oriented, and has no exams. The grades are based on a series of individual projects.
Research Areas:	One of goals of this course is to develop student research interests and skills. So far, this class was active in the following research areas:

- Workload metrics and workload characterization
- Benchmark design: methods and tools
- Software evaluation and quality assurance
- Decision support systems based on LSP method

Literature:

- Metrics

  Dujmović, J.J., *Software Metrics*. Course reader. SFSU 2005.
  Kan, S.H, *Metrics and Models in Software Quality Engineering*. Second
  Edition, Addison-Wesley, 2003
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  Process Improvement*. Prentice Hall, 1992.
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  Lorenz, M. and J. Kidd, *Object-Oriented Software Metrics*. P-H, 1994.
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  Addison-Wesley, 2000
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- QA

  Galin, D., *Software Quality Assurance*. Addison-Wesley, 2004
  Schulmeyer, G.G., McManus, J.I., *Handbook of Software Quality
  Assurance*. Prentice Hall 1999.
  Unhelkar, B., *Process Quality Assurance for UML-Based Projects*.
  Addison-Wesley, 2003
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  1998.

- Testing

  Marick, B., The Craft of Software Testing. Prentice Hall 1995.
  Tamres, L., *Introducing Software Testing*. Addison-Wesley, 2002
  DeMillo, R.A., McCracken, W.M, Martin, R.J., Passafiume, J.F.,
  Software Testing and Evaluation. Benjamin Cummings, 1987.

- Economics

  B.W. Boehm, *Software Engineering Economics*. Prentice-Hall 1981.
  M.L. Shooman, *Software Engineering*. McGraw-Hill, 1983.