



NAVAL
POSTGRADUATE
SCHOOL

Software Engineering Program

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Software Engineering Program

The NPS Software Engineering Program offers graduate education in the principles and practices of software engineering with thesis options of military relevance and significance

We combine a systems perspective with modeling and design at all levels of levels of representation from capabilities and requirements down to executable code



Software Engineering Program

Provide military and civilian graduate students with study in all the relevant levels of software development

Provide the skills needed to plan, design, and implement large-scale software-intensive systems using the best available science and technology

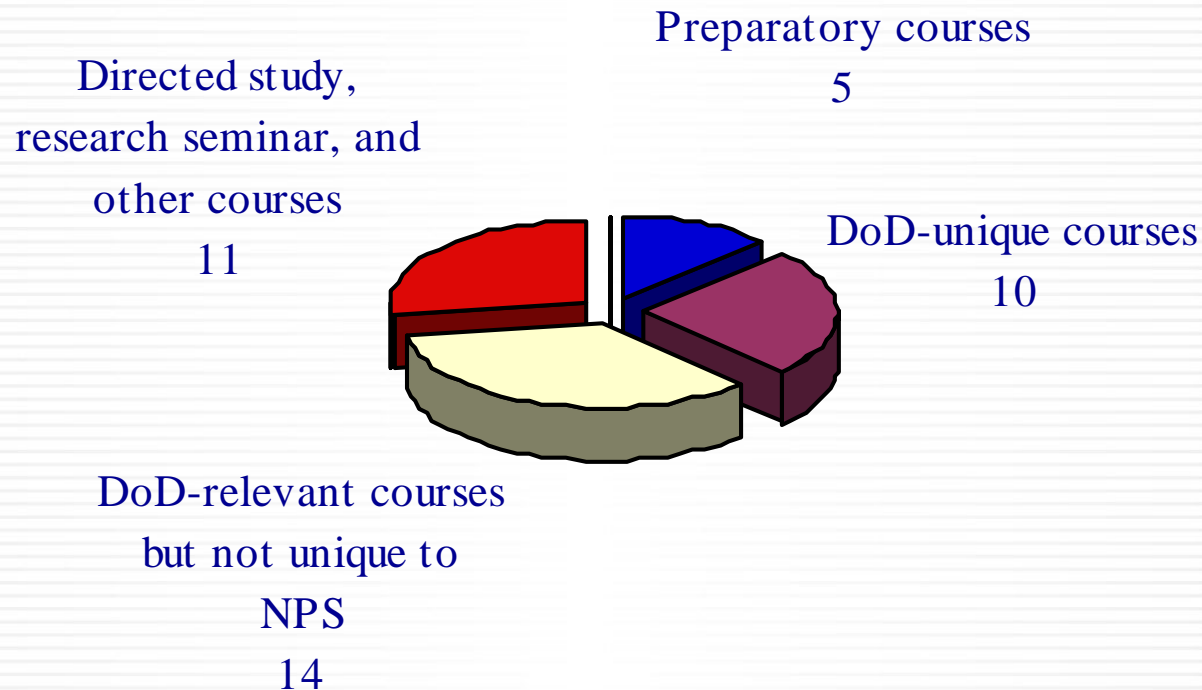
These skills are essential for officers and civilians responsible for acquisition, development or maintenance of defense software



Software Engineering Curriculum

Software Engineering Program

There are 40 courses within the Software Engineering curriculum, the majority of which are either DoD-unique or DoD-relevant





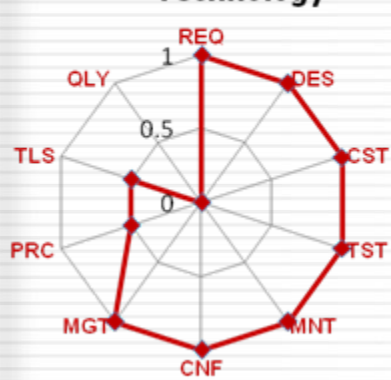
Intro to SWE

REQ	Software Requirements
DES	Software Design
CST	Software Construction
TST	Software Testing
MNT	Software Maintenance

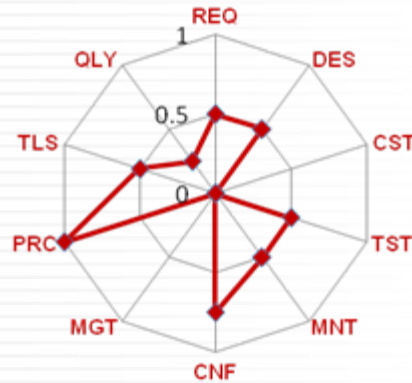
CNF	Software Configuration Management
MGT	Software Engineering Management
PRC	Software Engineering Process
TLS	Software Engineering Tools and Methods
QLY	Software Quality

1.00 > 90% of subtopics
0.75 ~75% of subtopics
0.50 ~50% of subtopics
0.25 ~25% of subtopics
0.00 No Coverage

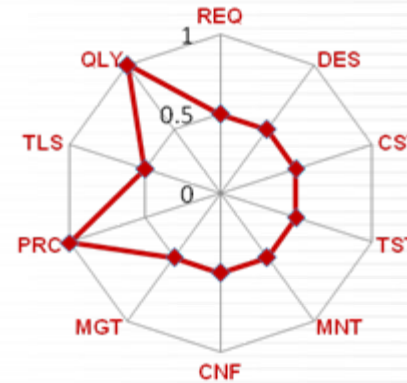
Air Force Institute of Technology



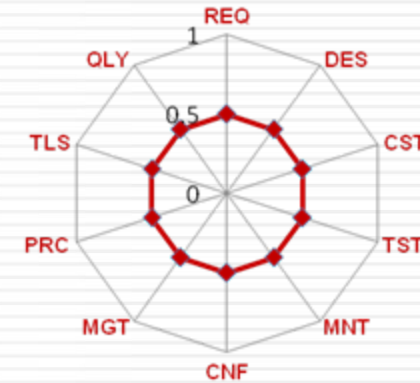
California State University - Sacramento



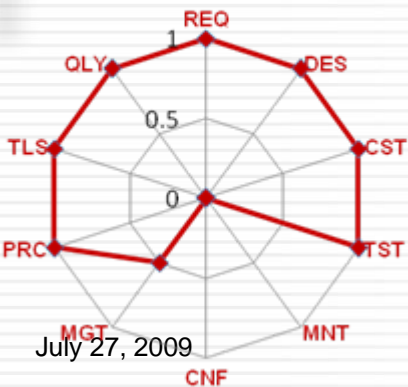
Embry Riddle Aeronautical University



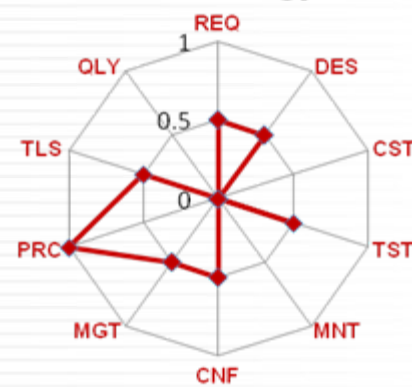
Monmouth University



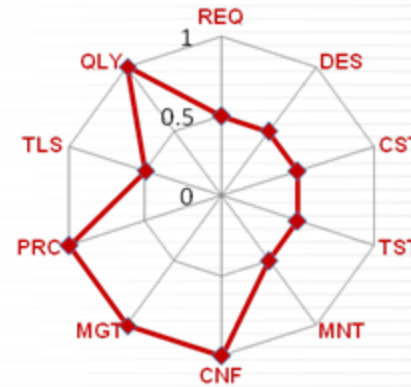
Naval Postgraduate School



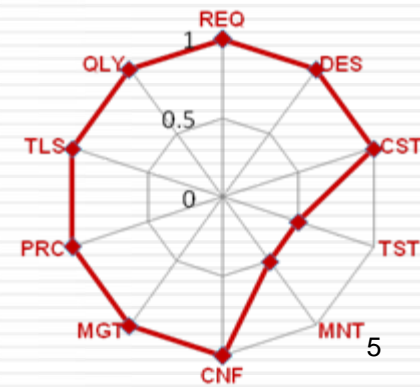
Stevens Institute of Technology



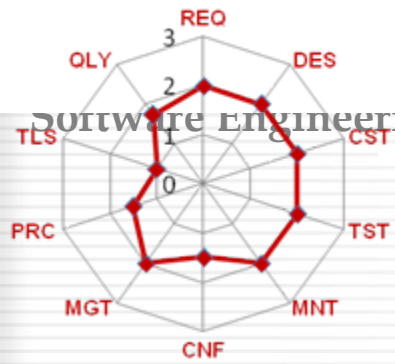
University of Alabama - Huntsville



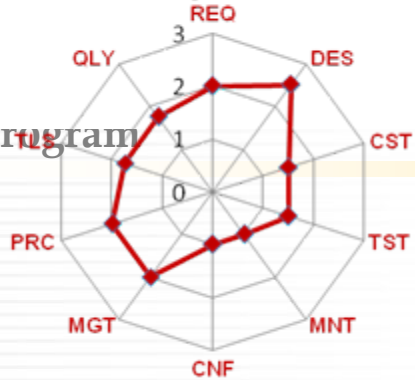
University of Southern California



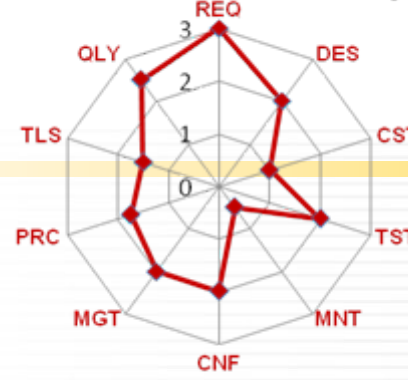
Air Force Institute of Technology



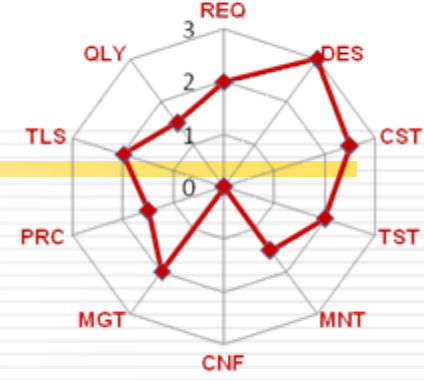
California State University - Sacramento



Embry Riddle Aeronautical University

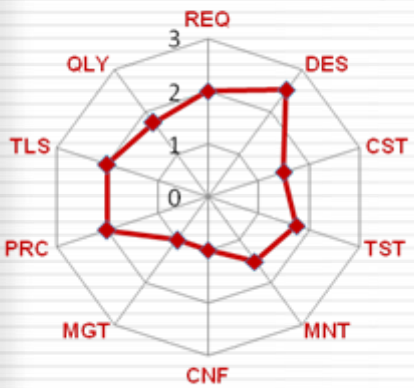


George Mason University

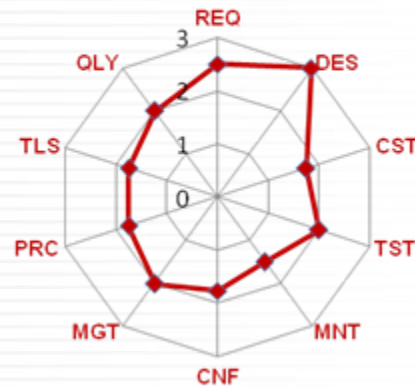


Software Engineering Program

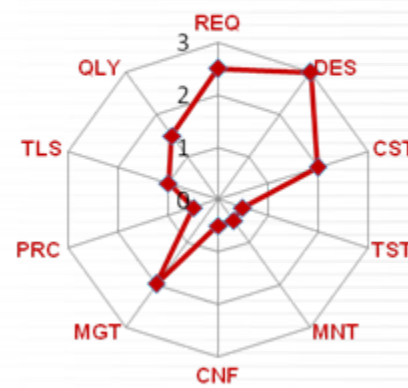
Monmouth University



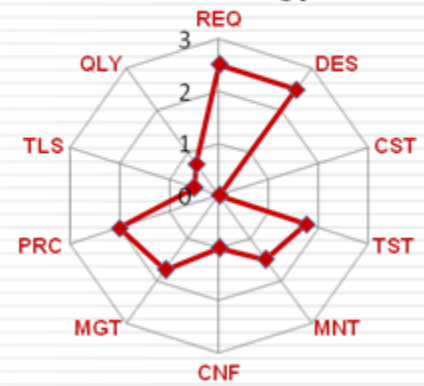
Naval Postgraduate School



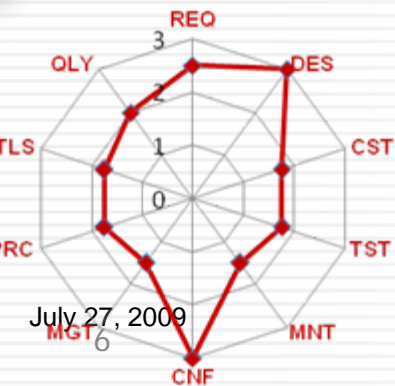
Seattle University



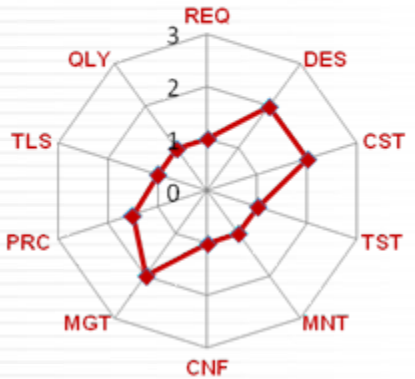
Stevens Institute of Technology



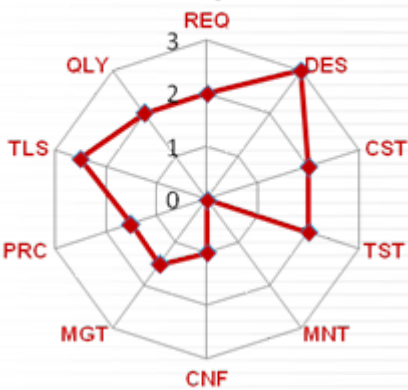
University of Alabama - Huntsville



University of Southern California



University of York



- 3.00 >1Req. or Semi Req. Course
- 2.00 1 Req. or Semi Req. Course
- 1.00 Introductory course
- 0.00 No Course

Required and Semi-Required Courses

July 27, 2009



Software Engineering Program

- The MSSWE degree was established at NPS in 1995
- All recipients of the MSSWE degree must
 - Become competent in Software Engineering core subjects
 - Develop advanced expertise in one or more of the following functional areas of Software Engineering:
 - Software Requirements Engineering
 - Software Design
 - Software Construction
 - Software Testing
 - Software Evolution & Maintenance
 - Software Quality Engineering
 - Software Engineering Management
 - Software Engineering Infrastructure
 - Software Engineering Process

Software Engineering Program

- The department also offers the MSCS Software Engineering & Architecture track, consisting of two areas of study:
 - Software-Intensive System Development
 - Software Testing
 - Software Reliability
 - Software Risk Assessment
 - Design of Embedded Real-time Systems
 - Weapon System Software Safety
 - Autonomous Systems
 - Robotics
 - Learning Systems and Data Mining
 - Language Systems
 - Cognitive Engineering
 - Design of Embedded Real-Time Systems



Software Engineering Program

- First doctoral program in Software Engineering in the world (established in 1998)
- Provides a unique program of study supporting the advancement of Software Engineering principles and technology to DoD researchers and practitioners, enabling them to
 - Acquire skills and knowledge needed to perform state-of-the-art research on issues related to the development of large complex software systems
 - Direct and manage teams of software professionals



Software Engineering Program

Program	Current Enrollment	Graduates
SWE PhD	26	22
SWE MS Resident	3	24
SWE MS Distance Learning	8	72
CS MS (SWE Track)	6	121
SWE Combat System Curriculum	0	3
SWE Certificate	0	28



Software Engineering Program

Committed to providing outreach with the help of Distance Learning technology...

- In addition to resident education, we deliver the same MS and PhD programs in Software Engineering via DL
- 26 faculty including most of the TT have completed IDL (Interactive Distributed Learning) course
 - Using Blackboard to host their course Web sites
- Organizations that fund students to study Software Engineering via DL include SPAWAR, NAVSEA, NSWC, NSA, MDA, Army TACOM, and Asst. Sec. of Army (ALT)
- We also conduct
 - Certificate programs
 - Short courses



Software Engineering Program

- **Developing Dependable Software for a System-of-Systems**
 - *Dr. Butch Caffall, Director, NASA IV&V Facility*
- **Evolving a Simulation Module Product Line Software Architecture from heterogeneous Model Representations**
 - *Dr. Kevin Greaney (COL, USA Ret.)*
- **Improving Software Quality and Management through the Use of SLAs**
 - *CDR Leonard Gaines, USN, HQ Defense Logistics Agency*
- **A Formal Application of Safety and Risk Assessment in Software Projects**
 - *CDR Christopher Williamson, USN*
- **Holistic framework for establishing interoperability of heterogeneous software development tools**
 - *COL Joseph Puett, USA*



Software Engineering Program

- A Test Methodology for Reliability Assessment of Collaborative Tools
 - *Ms. Brenda Powers, SPAWAR*
- Convergence of the Naval Information Infrastructure
 - *LCDR James Knoll, USN*
- A Methodology for Developing Timing Constraints for the Ballistic Missile Defense System
 - *CDR Michael Miklaski, USN and CPT Joel Babbitt, USA*
- Extending the Computer-aided Software Evolution System (CASES) with Quality Function Deployment (QFD)
 - *MAJ Arthur Clomera, USA*
- A System Of Systems Interface Hazard Analysis Technique