

# SOFTWARE ENGINEERING (SOFT)

---

## SOFT 160 Software Engineering I

**Prerequisites:** MATH 103 or equivalent.

**Notes:** Letter grade only.

**Description:** Introduction to software engineering and to problem solving with computers. Topics include problem solving methods, the use of computational resources to solve problems, and techniques for collaborative software development. Techniques based on disciplined software engineering principles and practices for engineering, building, analyzing and managing software-related artifacts. Common tools and techniques for developing, analyzing, testing, debugging, and managing software and software-related artifacts.

**Credit Hours:** 4

**Max credits per semester:** 4

**Max credits per degree:** 4

**Grading Option:** Graded

**Prerequisite for:** CSCE 235; CSCE 235H; CSCE 311; MECH 300; MECH 350; SOFT 161; SOFT 161H; SOFT 360

## SOFT 160H Software Engineering I

**Prerequisites:** MATH 103 or equivalent

**Description:** Introduction to software engineering and to problem solving with computers. Topics include problem solving methods, the use of computational resources to solve problems, and techniques for collaborative software development. Techniques based on disciplined software engineering principles and practices for engineering, building, analyzing and managing software-related artifacts. Common tools and techniques for developing, analyzing, testing, debugging, and managing software and software-related artifacts.

**Credit Hours:** 4

**Max credits per semester:** 4

**Max credits per degree:** 4

**Grading Option:** Graded

**Offered:** FALL

**Prerequisite for:** CSCE 235; CSCE 235H; SOFT 161; SOFT 161H

## SOFT 161 Software Engineering II

**Prerequisites:** A grade of C+ or higher in either SOFT 160 or SOFT 160H.

**Notes:** Letter grade only.

**Description:** Software engineering techniques and tools for designing, modeling, and building event-driven and multi-layer applications. Topics include advanced data structure, persistent data storage, object-oriented programming, and techniques for testing complex software systems.

**Credit Hours:** 4

**Max credits per semester:** 4

**Max credits per degree:** 4

**Grading Option:** Graded

**Prerequisite for:** CSCE 310; CSCE 310H; CSCE 322; CSCE 322H; CSCE 378; CSCE 378H; CSCE 453H, RAIK 453H; SOFT 260; SOFT 360

## SOFT 161H Honors: Software Engineering II

**Prerequisites:** A grade of C+ or higher in either SOFT 160 or SOFT 160H.

**Description:** Software engineering techniques and tools for designing, modeling, and building event-driven and multi-layer applications. Topics include advanced data structure, persistent data storage, object-oriented programming, and techniques for testing complex software systems.

**Credit Hours:** 4

**Max credits per semester:** 4

**Max credits per degree:** 4

**Grading Option:** Graded

**Offered:** SPRING

**Prerequisite for:** CSCE 322; CSCE 322H; CSCE 378; CSCE 378H; CSCE 453H, RAIK 453H; SOFT 260

## SOFT 162 Software Engineering Fundamentals

**Prerequisites:** CSCE 156, CSCE 156H or equivalent

**Notes:** Students must earn a grade of C+ or higher in this course to be admitted to the Software Engineering program.

**Description:** Introduction to software engineering and problem solving with computers.

**Credit Hours:** 2

**Max credits per semester:** 2

**Max credits per degree:** 2

**Grading Option:** Graded

**Offered:** SUMMER

**Prerequisite for:** SOFT 260

## SOFT 260 Software Engineering III

**Prerequisites:** A grade of C+ or higher in either SOFT 161, SOFT 161H or SOFT 162; CSCE 235.

**Notes:** Letter grade only.

**Description:** Advanced data structures and their associated algorithms for solving computational problems. Techniques for systematically specifying, managing, and analyzing software requirements, and for managing software change and working effectively in teams.

**Credit Hours:** 4

**Max credits per semester:** 4

**Max credits per degree:** 4

**Grading Option:** Graded

**Prerequisite for:** CSCE 351; CSCE 360; CSCE 361, CSCE 361H; SOFT 261; SOFT 261H, RAIK 284H; SOFT 360

## SOFT 260H Honors: Software Engineering III

**Crosslisted with:** RAIK 283H

**Prerequisites:** A grade of C+ or higher in either SOFT 161 or SOFT 161H or SOFT 162 or RAIK 184H or equivalent; CSCE 235.

**Description:** Advanced data structures and their associated algorithms for solving computational problems. Techniques for systematically specifying, managing, and analyzing software requirements, and for managing software change and working effectively in teams.

**Credit Hours:** 4

**Max credits per semester:** 4

**Max credits per degree:** 4

**Grading Option:** Graded

**Offered:** FALL

**Prerequisite for:** CSCE 351; CSCE 360; CSCE 361, CSCE 361H; SOFT 261; SOFT 261H, RAIK 284H

**SOFT 261 Software Engineering IV**

**Prerequisites:** A grade of C+ or higher in SOFT 260 or equivalent.

**Description:** Techniques and tools based on disciplined software engineering principles for producing, interpreting, and communicating visual artifacts related to software architecture and construction.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded

**Offered:** FALL/SPR

**Prerequisite for:** CSCE 461, CSCE 861, SOFT 461; CSCE 486; CSCE 486H

**ACE:** ACE 2 Communication Competence

**SOFT 261H Software Engineering IV**

**Crosslisted with:** RAIK 284H

**Prerequisites:** Good Standing in UNL Honors Program or by invitation; a grade of C+ or higher in SOFT 260, SOFT 260H, or RAIK 283H.

**Description:** Techniques and tools based on disciplined software engineering principles for producing, interpreting, and communicating visual artifacts related to software architecture and construction.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded

**Offered:** FALL/SPR

**Prerequisite for:** CSCE 461, CSCE 861, SOFT 461; CSCE 486H; RAIK 401H, BSAD 401H, CSCE 401H, SOFT 401H

**ACE:** ACE 2 Communication Competence

**SOFT 360 Software Engineering Mentoring and Leadership**

**Prerequisites:** A grade of C or higher in SOFT 160, SOFT 161, SOFT 260 or SOFT 261

**Notes:** Letter grade only.

**Description:** Mentoring and leading software engineering teams. Topics include roles and responsibilities of a leader, roles and responsibilities of a mentor, and traits of effective leaders and mentors. Techniques for effectively mentoring and leading software engineering teams.

**Credit Hours:** 1

**Max credits per semester:** 1

**Max credits per degree:** 1

**Grading Option:** Graded

**SOFT 401H Honors: RAIK Design Studio I**

**Crosslisted with:** RAIK 401H, BSAD 401H, CSCE 401H

**Prerequisites:** Good standing in the University Honors Program or by invitation; admission to the Jeffrey S. Raikes School of Computer Science and Management; RAIK 383H or equivalent.

**Notes:** First semester in the Jeffrey S. Raikes School of Computer Science and Management design studio

**Description:** Application of Raikes School core content in a team oriented, project management setting. Complete projects in consultation with private and public sector clients.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded

**Offered:** FALL

**Prerequisite for:** RAIK 402H, BSAD 402H, CSCE 402H, SOFT 402H

**ACE:** ACE 8 Civic/Ethics/Stewardship

**SOFT 402H Honors: RAIK Design Studio II**

**Crosslisted with:** RAIK 402H, BSAD 402H, CSCE 402H

**Prerequisites:** Good standing in the University Honors Program or by invitation; admission to the Jeffrey S. Raikes School of Computer Science and Management; BSAD/CSCE/SOFT/RAIK 401H.

**Notes:** Second semester in the Jeffrey S. Raikes School of Computer Science and Management design studio

**Description:** Application of Raikes School core content in a team oriented, project management setting. Complete projects in consultation with private and public sector clients.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded

**Offered:** SPRING

**Prerequisite for:** RAIK 403H, BSAD 403H, CSCE 403H

**ACE:** ACE 10 Integrated Product

**SOFT 403 Software Engineering Capstone I**

**Prerequisites:** CSCE 487 or equivalent

**Notes:** Must be taken exactly one semester before SOFT 404.

**Description:** A substantial software engineering project requiring design, planning and scheduling, teamwork, written and oral communications, and the integration and application of technical and analytical aspects of computer science and software engineering in consultation with private and public sector clients.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded

**Offered:** FALL

**Prerequisite for:** SOFT 404; SOFT 404H

**SOFT 403H Honors: Software Engineering Capstone I**

**Prerequisites:** CSCE 487 or CSCE 487H or equivalent.

**Notes:** Must be taken exactly one semester before SOFT 404 or SOFT 404H.

**Description:** A substantial software engineering project requiring design, planning and scheduling, teamwork, written and oral communications, and the integration and application of technical and analytical aspects of computer science and software engineering in consultation with private and public sector clients.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded

**Offered:** FALL

**Prerequisite for:** SOFT 404H

**SOFT 404 Software Engineering Capstone II**

**Prerequisites:** SOFT 403 (taken exactly one semester previous).

**Description:** A substantial software engineering project requiring design, planning and scheduling, teamwork, written and oral communications, and the integration and application of technical and analytical aspects of computer science and software engineering in consultation with private and public sector clients.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Graded

**Offered:** SPRING

**SOFT 404H Honors: Software Engineering Capstone II****Prerequisites:** SOFT 403 or SOFT 403H.**Notes:** Must be taken exactly one semester after SOFT 403 or SOFT 403H.**Description:** A substantial software engineering project requiring design, planning and scheduling, teamwork, written and oral communications, and the integration and application of technical and analytical aspects of computer science and software engineering.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**SOFT 460 Software Engineering for Robotics****Crosslisted with:** CSCE 460, CSCE 860**Prerequisites:** SOFT 261 or RAIK 383H or CSCE 361**Description:** Application of software engineering practices and principles to autonomous robotic systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**SOFT 461 Advanced Topics in Software Engineering****Crosslisted with:** CSCE 461, CSCE 861**Prerequisites:** A grade of "P" or "C" or better in CSCE 361, CSCE 361H, SOFT 261, SOFT 261H or RAIK 383H.**Description:** Advanced or emerging techniques in software engineering. Topics include but not limited to design methodology, software dependability, and advanced software development environments.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded with Option**SOFT 466 Software Design and Architecture****Crosslisted with:** CSCE 466, CSCE 866**Prerequisites:** A grade of "P" or "C" or better in CSCE 361, CSCE 361H, SOFT 261, SOFT 261H or RAIK 383H.**Notes:** Letter grade only.**Description:** Introduction to the concepts, principles, and state-of-the-art methods in software design and architecture. Topics include application of software engineering process models and management approaches for the design and architecture of large-scale software systems, trade-offs of designing for qualities such as performance, security, and dependability, and techniques and tools for analyzing and evaluating software architectures.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**SOFT 467 Testing, Verification and Analysis****Crosslisted with:** CSCE 467, CSCE 867**Prerequisites:** A grade of "P" or "C" or better in CSCE 361, CSCE 361H, SOFT 261, SOFT 261H or RAIK 383H.**Notes:** Letter grade only.**Description:** In-depth coverage of problems related to software quality, and approaches for addressing them. Topics include testing techniques, dynamic and static program analysis techniques, and other approaches for verifying software qualities. Tool support for performing testing, verification, and analysis will also be studied.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Course and Laboratory Fee:** \$20**SOFT 468 Requirements Elicitation, Modeling and Analysis****Crosslisted with:** CSCE 468, CSCE 868**Prerequisites:** A grade of "P" or "C" or better in CSCE 361, CSCE 361H, SOFT 261, SOFT 261H or RAIK 383H.**Notes:** Letter grade only.**Description:** In-depth coverage of processes, methods and techniques for determining, or deciding, what a proposed software system should do. Topics include the requirements engineering process, identification of stakeholders, requirements elicitation techniques, methods for informal and formal requirements documentation, techniques for analyzing requirements models for consistency and completeness, and traceability of requirements across system development and evolution. Tool support for modeling functional and non-functional requirements to support elicitation and analysis will be studied.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded