

SCIENCE & ENGINEERING (SE)

SE 1000 - Problem Solving Fundamentals

1 Credit

This course is designed to benefit first-year SSE students who may struggle to meet their SSE program requirements due a gap in content specific problem-solving skills as identified during the University's initial placement process. The course is designed to keep students on track by reviewing their chemistry, physics, and engineering-based quantitative reasoning needed for success in introductory STEM classes. Additionally, this course will utilize community-based learning strategies and will focus on the professional competencies and skills required for student success at the University level. This course will prepare first-year SSE students for success by reinforcing: 1. Applied quantitative scientific problem-solving skills 2. Peer learning and community-based study strategies 3. Professional competencies including teamwork, timeliness, and technology use.

SE 1700 - Engineering Fundamentals

2 Credits

The course introduces engineering problem solving process. Algorithmic and visual skills and computer tools are introduced. It also exposes students to the engineering career paths.

Attributes: UUC:Ignite Seminar

SE 1701 - Engineering Fundamentals Studio

1 Credit

Companion course to Engineering Fundamentals.

SE 1709 - Introduction to Engineering

2 Credits

The course introduces the engineering profession and problem solving process. Algorithmic and visual skills and computer tools are introduced.

SE 1930 - Special Topics

1-4 Credits (Repeatable for credit)

Special Topics in Science and Engineering.

SE 2870 - Foundational Interdisciplinary Research Experience (FIRE) - Learn

1 Credit

FIRE Learn introduces undergraduate students to the foundational principles of research methodology and entrepreneurial mindset (EM). This course is designed to prepare students for participation in the FIRE Lab and FIRE Launch components of the FIRE program. Students will engage with the essentials of academic and applied research, including experimental design, data analysis, and ethical considerations, while also exploring the basics of entrepreneurship, including idea generation, product development, and market analysis. A focus will be placed on interdisciplinary collaboration and the integration of research with entrepreneurial ventures. By the end of the course, students will have a deeper understanding of how research and entrepreneurship complement each other and will be ready to engage in hands-on interdisciplinary projects.

SE 2930 - Special Topics

1-4 Credits (Repeatable for credit)

Special Topics in Science and Engineering.

SE 3110 - Sensors and Society

3 Credits

Sensors and Society is a multidisciplinary, project-based course in which students design sensor technologies to address real-world societal, medical, environmental, or global challenges. Working in collaborative teams, students integrate principles from chemistry, biology, engineering, data analysis, and the humanities with entrepreneurial and ethical perspectives. The course emphasizes problem identification, community and market research, feasibility and cost analysis, and iterative design. Students engage with guest speakers from academia, industry, and entrepreneurship, gain exposure to laboratory and prototyping environments, and explore the responsible use of emerging tools such as artificial intelligence in research and design. Throughout the semester, students critically examine the societal impact, ethical implications, and global relevance of technological innovation. The course culminates in a presentation and project pitch that synthesizes technical design, market considerations, and social responsibility.

Prerequisite(s): CORE 1500*; Minimum Earned Credits of 60; CORE 1000

* Concurrent enrollment allowed.

Attributes: UUC:Collaborative Inquiry

SE 3870 - Foundational Interdisciplinary Research Experience (FIRE) - Lab

1 Credit (Repeatable up to 6 credits)

FIRE Lab is the core hands-on research component of the Foundational Interdisciplinary Research Experience (FIRE) program, where students participate in ongoing research projects led by faculty from various departments within the School of Science and Engineering. Students engage in both basic and applied research, contributing to experimental design, data collection, analysis, and reporting. This course is intended for students who are ready to engage in advanced research tasks, with an emphasis on collaboration, critical thinking, and problem-solving. Students will also gain experience in presenting and communicating their research to both technical and non-technical audiences.

Attributes: Special Approval Required

SE 3875 - Foundational Interdisciplinary Research Experience (FIRE) - Launch

1 Credit (Repeatable up to 6 credits)

FIRE Launch provides students the opportunity to move research projects into a real-world entrepreneurial context. Students will work in teams to develop, refine, and potentially commercialize their research projects in collaboration with the SLULaunch program. In this course, students will gain exposure to the process of entrepreneurship, including idea validation, product development, and market analysis. They will receive mentorship from faculty and industry professionals, learning how to navigate the complexities of launching a technology-based venture. FIRE Launch aims to bridge the gap between academic research and entrepreneurial application, empowering students to translate their discoveries into innovative solutions with market potential.

SE 3930 - Special Topics

1-4 Credits (Repeatable for credit)

Special Topics in Science and Engineering.

SE 4100 - Introduction to Additive Manufacturing and Design

1 Credit

This course introduces the principles, applications, and design considerations of additive manufacturing (AM). Students will explore AM technologies, workflows, and software tools while gaining hands-on experience in design for AM.

SE 4200 - Additive Manufacturing Fundamentals

2 Credits

This course provides a technical foundation in additive manufacturing (AM), focusing on process physics, material properties, and machine operations. Students will gain proficiency in operating AM equipment and troubleshooting common issues.

Corequisite(s): SE 4100

SE 4300 - Analysis of Additive Manufacturing

3 Credits

This advanced course focuses on the analytical and computational aspects of AM, including performance optimization, process modeling, and sustainability. Students will evaluate AM's role in various industries and develop data-driven solutions.

SE 4870 - Foundational Interdisciplinary Research Experience (FIRE) - Lab

1 Credit (Repeatable up to 6 credits)

FIRE Lab is the core hands-on research component of the Foundational Interdisciplinary Research Experience (FIRE) program, where students participate in ongoing research projects led by faculty from various departments within the School of Science and Engineering. Students engage in both basic and applied research, contributing to experimental design, data collection, analysis, and reporting. This course is intended for students who are ready to engage in advanced research tasks, with an emphasis on collaboration, critical thinking, and problem-solving. Students will also gain experience in presenting and communicating their research to both technical and non-technical audiences.

Attributes: Special Approval Required

SE 4875 - Foundational Interdisciplinary Research Experience (FIRE) - Launch

1 Credit (Repeatable up to 6 credits)

FIRE Launch provides students the opportunity to move research projects into a real-world entrepreneurial context. Students will work in teams to develop, refine, and potentially commercialize their research projects in collaboration with the SLULaunch program. In this course, students will gain exposure to the process of entrepreneurship, including idea validation, product development, and market analysis. They will receive mentorship from faculty and industry professionals, learning how to navigate the complexities of launching a technology-based venture. FIRE Launch aims to bridge the gap between academic research and entrepreneurial application, empowering students to translate their discoveries into innovative solutions with market potential.

SE 4930 - Special Topics

1-4 Credits (Repeatable for credit)

Special Topics in Science and Engineering.

SE 4970 - Advanced Independent Research in Science and Engineering

1-3 Credits (Repeatable for credit)

Individual or small group investigation of a topic.

SE 5810 - Experiential Entrepreneurship Studio Research - I

3 Credits

The experiential research coursework will be focused on innovation in STEM-focus areas, advancement of technology, and the development of products. In an effort to focus on advancing and developing technologies and taking them to market, this experience will join practicality and theory in the classroom with real life implications through experiential and hands-on learning. EESR will combine STEM technology developed on campus or through industry partners, experience of entrepreneurs and executives in residence, and the talent, curiosity and energy of students to create an experience that will lead to the launch of new ventures and the careers of our graduates. This course will cover topics such as ideation, team formation, sourcing technology, IP management, customer discovery, accounting fundamentals, and technology advancement / lab-work.

Attributes: Special Approval Required

SE 5820 - Experiential Entrepreneurship Studio Research - II

3 Credits

The experiential research coursework will be focused on innovation in STEM-focus areas, advancement of technology, and the development of products. In an effort to focus on advancing and developing technologies and taking them to market, this experience will join practicality and theory in the classroom with real life implications through experiential and hands-on learning. EESR will combine STEM technology developed on campus or through industry partners, experience of entrepreneurs and executives in residence, and the talent, curiosity and energy of students to create an experience that will lead to the launch of new ventures and the careers of our graduates. This course will cover topics such as business models, minimum viable products (MVPS), customer discovery, financial modeling, and technology advancement / lab-work.

Attributes: Special Approval Required

SE 5830 - Experiential Entrepreneurship Studio Research - III

3 Credits

The experiential research coursework will be focused on innovation in STEM-focus areas, advancement of technology, and the development of products. In an effort to focus on advancing and developing technologies and taking them to market, this experience will join practicality and theory in the classroom with real life implications through experiential and hands-on learning. EESR will combine STEM technology developed on campus or through industry partners, experience of entrepreneurs and executives in residence, and the talent, curiosity and energy of students to create an experience that will lead to the launch of new ventures and the careers of our graduates. This course will cover topics such as customer experiences, sales, fundable technology, raising capital, pitching, operations.

Attributes: Special Approval Required

SE 5930 - Special Topics

1-4 Credits (Repeatable for credit)

Special Topics in Science and Engineering.