

Student Integrated Intern Research Experience (SIIRE) - A Pathway to Graduate Studies

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Topics

- What is SIIRE?
 - Goals of NSF S-STEM programs
 - Who is associated with the grant?
- How does the program work?
- What is the motivation for SIIRE?
- How can you help?

What does SIIRE stand for?

- SIIRE stands for Student Integrated Intern Research Experience.
 - It is the result of a proposal to NSF funded at the end of August 2012.
 - The project addresses the national need for increasing the number of U.S. citizens who complete engineering degrees
- SIIRE provides financial support through scholarships and integrates industry supported work experiences with on-campus research activities to provide a pathway to a graduate engineering degree.
 - It is designed to serve all of the College of Engineering
 - Scholarships for sophomores through graduate studies.

What is the NSF S-STEM Program?

- This program makes grants to institutions of higher education to support scholarships for academically talented, financially needy students, enabling them to enter the workforce following completion of an associate; baccalaureate; or graduate-level degree in science and engineering disciplines.
- Thus, SIIRE is a scholarship program!

Who is associated with SIIRE?

- All of the college of engineering
- NSF only permits up to 5 co-pi's
 - Co-PI's represent Civil, Industrial, and Chemical Engineering
- Named Senior Personnel
 - Dr. Magda El-Shenawee (ELEG), Dr. Dale Thompson (CSCE)
- COE Dean's Office
 - Thomas Carter, Bryan Hill

Who is associated? (cont.)

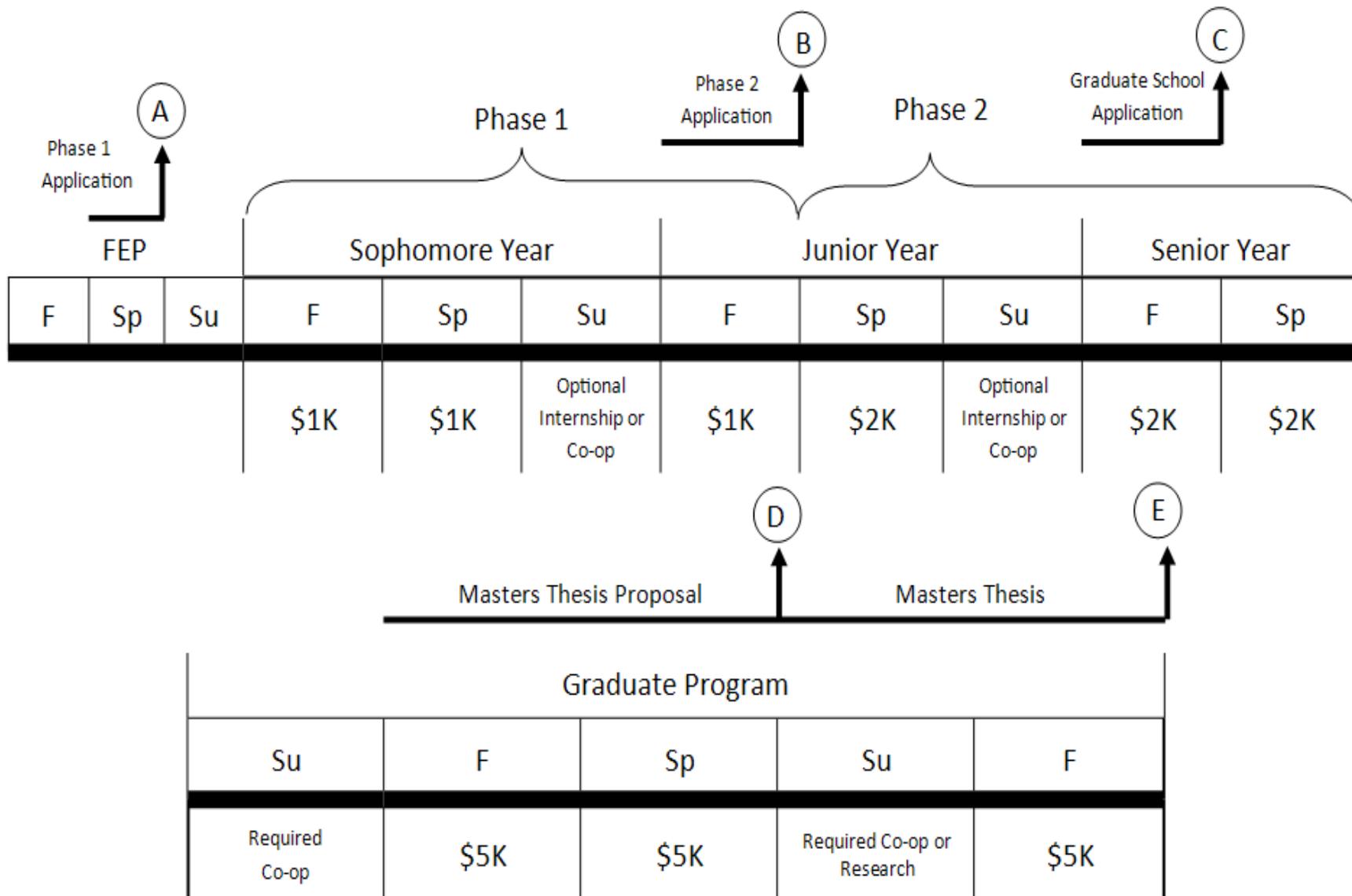
- College of Engineering
 - Department Head letters of support
 - Dr. Verma, Dr. Gauch, Dr. Balda, Dr. Needy, Dr. Hall, Dr. Spicer
 - Bill Springer, Rick Couvillion helped with company contacts
- Other UA letters of support
 - Dr. Todd Shields (Graduate School), Dr. Angela Williams (Career Development Center), Wendy Stouffer (Office of Financial Aid)
- Company letters of support
 - DayCo, ABF, JB Hunt, APAC-Central, Inc., Garver, Beaver Water District, Tatum Smith Engineers, Silicon Solar Solutions, HIDEC, NanoMech, Wal-Mart, Dassault

What are SIIRE's main elements?

- leveraged scholarship support for a cohort of students with financial need
- a cohort of students focused upon COE research initiatives
- integrated one-on-one faculty and industry joint mentoring
- industry motivated graduate research topics
- course work options enabling completion of B.S. and M.S. degrees in 5.5 total years
- the seeding of highly trained practicing engineers within the workforce

How does SIIRE work?

- The program is designed with 3 phases
 - Phase 1 supports students for 3 semesters starting in the fall of their sophomore year
 - Phase 1 culminates in an application for further support in Phase 2
 - Phase 2 supports students for 3 semesters starting in the spring of the junior year
 - Phase 3 supports students through 3 semesters of graduate studies



The SIIRE Program

Phase 1

- Freshman Year Spring Semester
 - Students are recruited and can apply for phase 1 scholarship of 1K per semester.
- Sophomore Year
 - Students matched with participating COE faculty
 - Students participate in career enrichment activities
- Co-op or research experience during summer
 - Faculty serves as mentor during co-op experience
- Fall Junior year
 - Students develop phase 2 application
 - Essentially a preliminary graduate school application

Phase 2

- Junior Year Spring Semester
 - Continue enrichment activities
 - Identify co-op and research opportunities
 - Scholarship increases to 2K per semester
- Summer end of Junior Year
 - Co-op or research experience
- Senior Year
 - Increased scholarship to 4K per semester
 - Enrichment activities
 - Apply for graduate school

Graduate Studies

- Year 1 Graduate Studies
 - Co-op prior to starting graduate studies
 - Identify research topic with industry support
 - Take classes Fall/Spring
 - Graduate tuition and stipend covered
 - Graduate school tuition waiver
 - Stipend is 10K for full year
 - Spring Semester
 - Present Masters Thesis Proposal

Graduate Studies

- Year 2 Graduate Studies
 - Co-op in Summer
 - Work on thesis as part of co-op
 - Fall Semester
 - Finish graduate course work
 - Present completed thesis

Educational Enrichment Activities

	Sophomore	Junior	Senior	MS Year 1	MS Year 2
Work Experience (summer)	Optional Co-Op or Internship	Optional Co-Op or internship	Required Co-Op or internship	Required Co-op/internship on graduate research	
Research Experience	Optional	Optional	Required	Prepare MS thesis proposal	Defend MS thesis
Professional Development Activities	Seminar: How to be an effective mentee; time management	Seminar: Effective oral/written communications	Workshop: Applying for graduate schools	Workshop: Writing and presenting a business case	Seminar: Transition from student to employee
	Seminar: Resume writing & job search skills	Seminar: Developing research skills	Seminar: 7 Habits of Highly Effective People	Seminar: Presenting and communicating research	Seminar: Ethics in research and professional life
Faculty Mentoring	Monthly meeting	Meeting at least twice a month	Meeting at least twice a month	Meeting at least once per week	Meeting at least once per week
Peer Mentoring	As needed, at least once per semester	As needed, at least once per semester	As needed, at least once per semester	As needed, at least once per semester	As needed, at least once per semester

- Enrichment activities to develop student capabilities
- Mentoring with faculty along the entire process
- Student to student mentoring

Underlying Philosophies

- Connect industry with MS research to form better appreciation for what a MS degree can bring to their company.
- Connect faculty with industry driven research topics.
- Research shows the faculty mentoring is one of the most important factors associated with degree completion.
- Increase the number of Arkansan's with advanced engineering degrees.
- The higher the education level achieved by a person the more likely that the person's children will be expected to achieve higher education.

Arkansas is in need of more engineers!

- US Census Bureau's 2005-2009 American Community Survey (ACS) 5-Year estimates, the national mean percentage of full-time employed workers (age > 16) working within the Architecture and Engineering (A&E) sector is 2.37%.
 - **Arkansas is last in the nation (52nd, including D.C. and Puerto Rico), with an estimate of 1.44%!**
 - Mississippi (1.65%, 49th), Missouri (1.88%, 41st), Tennessee (2.01%, 36th), Oklahoma (2.03%, 35th), and Texas (2.6%, 19th).
- An A&E degree holder in Arkansas has a median salary \$53,432, which happens to be the highest median salary category in the state! Yet, why doesn't Arkansas have a higher percentage of A&E workers?
 - According to the US Census Bureau, the percentage of Arkansans 25 and older that hold a bachelors degree is only 18%, with the US average being 27.5%.

Engineering Education has an Impact

- Economic Impact of the UA Report
 - workers within the state with a bachelor's degree can expect to earn \$25,430 more annually over those with a high school diploma, with a graduate degree increasing that amount by \$13,036.
- The economic value of an engineering degree is ranked highest
 - Georgetown University's Center on Education and the Workforce recent publication [7], "What's it worth? The Economic Value of College Majors"
 - Graduate degree is worth 32% more than undergraduate degree.

SIIRE's Impact

- *These facts indicate that there is a critical need to increase the number of graduating engineers within the State of Arkansas in order for the state to gain the benefits associated with a highly educated workforce.*
- SIIRE is intended to create a systematic pipeline of diverse engineering professionals that contribute to our state.

How can you get involved?

- If you are a department head
 - Help us inform your faculty about SIIRE
 - Encourage a faculty member to join our team
- If you are a faculty member:
 - Help us to identify potential students
 - Be a mentor to a SIIRE student
 - Help us to get connected to industry partners
 - Participate in enrichment activities
 - Help develop enrichment activities

How can you get involved?

- If you are in industry?
 - Hire a SIIRE student for an intern or co-op position
 - Volunteer for our Industry/Academic Liaison Board
 - Help us to identify additional industry partners

Questions?

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