

Experiential Education Employer Reference Guide

Cooperative Education and Summer Internships and



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Introduction

This guide was developed to help employers establish and manage highly effective cooperative education and internship programs. These programs are periods of institutionally supervised, engineering-related, work experiences that supplement formal academic coursework and help the ISU College of Engineering develop some of the best engineering talent in the nation. These three-way partnerships between employers, students, and the College provide numerous benefits to students and employers alike.

The College of Engineering at Iowa State University has had an experiential education program since 1955. The experiential education program is an academic program controlled by the engineering faculty and administered by Engineering Career Services. Co-ops and internships are not required but students are highly encouraged to participate. The College has worked to create a barrier-free environment so as many students as possible can participate.

The ISU Experiential Education Program has:

- No defined start date
- No GPA requirement but the student must be in Good Academic Standing
- No fees to student or employer
- No tuition and full-time student status is retained

All forms of experiential education work experiences ranging from ten week summer internships to multi-term co-ops are offered. In the College of Engineering, internships and co-ops are both academic programs and managed exactly the same way. The primary difference is that an internship involves a single work term of at least 10 weeks duration in the summer; and a co-op involves a semester or a semester and summer of work experience with the same company. Multiple co-ops should not involve two semesters (excluding summer) of back-to-back work Experience.

Program Benefits to Participants

An effective experiential education program is a combined effort of the employer, student, and the college that enhances a student's academic studies with meaningful professional work experiences. All partners can benefit greatly from this combined effort.

EMPLOYER BENEFITS

Experiential education experiences are primarily for the benefit of the student, but there are many benefits to the employer.

- Opportunities for early engagement with top engineering talent with the goal of converting them to full-time employees upon graduation.
- More informed full-time hiring decisions because on-the-job performance is added to the personnel selection process.
- Higher full-time offer acceptance rates and reduced recruiting costs.
- Reduction of training and higher productivity of entry level hires.
- Increased retention rates of new employees due to a stronger connection to the company.
- An injection of creative energy and a transfer of knowledge about state-of-the-art equipment and practices being used at the university.
- Accomplishment of productive work with professional services from students.
- Improved recruiting due to enhanced visibility and reputation on campus when student employees return to campus and talk about their experience.

COLLEGE BENEFITS

The College of Engineering also benefits from:

- An enhanced academic program.
- Stronger institutional relations with employers.
- Improved career placement rates for graduates.
- Assessment data that contributes to curriculum development, continuous improvement activities and ABET accreditation.
(See Appendix 1 for the ABET Accreditation)

STUDENT BENEFITS

- Enhanced job exploration and clarification of career goals.
- Practical work experience that supplements classroom learning.
- A greater understanding and appreciation of educational needs and objectives.
- An improved ability to apply knowledge and make connections between theory and practice.
- Opportunities to develop interpersonal and group communication skills.
- Professional networking opportunities and the establishment of professional contacts.
- A greater sense of responsibility, self-confidence, and maturity.
- Employment in an engineering capacity with appropriate compensation that helps to defray college expenses.
- Hours worked as part of an educational institution supervised co-op or internship program can be counted towards the work experience requirements needed to qualify for a professional engineering license. The student must register the co-ops or internships so it will appear on his or her college transcript.

What is a Co-op or Internship?

Co-ops and internships are work experiences that enrich learning and skill development of the student. According to the National Association of Colleges and Employers (NACE), to be a true internship, the following criteria must be met:

1. The experience must be an extension of the classroom: i.e. a learning experience that provides for applying the knowledge gained in the classroom. It must not be simply to advance the operations of the employer or be the work that a regular employee would routinely perform.
2. The skills or knowledge learned must be transferable to other employment settings.
3. The experience has a defined beginning and end, and a job description with desired qualifications.
4. There are clearly-defined learning objectives/goals related to the professional goals of the student's academic coursework.
5. There is supervision by a professional with expertise and educational and/or professional background in the field of the experience.
6. There is routine feedback by the experienced supervisor.
7. There are resources, equipment, and facilities provided by the host employer that support learning objectives/goals.

The National Association of Colleges and Employers website:
www.nacweb.org



ISU College of Engineering Experiential Education Options

The college of engineering offers multiple experiential education program options to accommodate the needs of employers and students. Employers determine which option is best for their operation and students apply for the opportunities that work best for them.

COOPERATIVE EDUCATION

A single period of full-time engineering-related work experience of at least one semester or one semester plus the summer. Multiple internships should not involve two semesters (excluding summer) of back-to-back work experience.

SUMMER INTERNSHIP

A single period of full-time engineering related work experience of at least ten weeks during the summer academic break.

PARALLEL CO-OPS OR INTERNSHIPS Iowa Economic Development Authority

Experiential education experiences that meet the work time requirements of Cooperative Education. Multiple periods of part-time (20 hours/week) engineering-related work experience for a half-time student (6 to 9 credits). A parallel co-op will be at least two part-time semesters in duration or one part-time semester plus a full-time summer with the same company.

Iowa Economic Development Authority has two programs to help employers Iowa employers get grants to help pay the cost of employing interns.

IOWA STUDENT INTERNSHIP PROGRAM

The Iowa Student Internship Program provides grants to small and medium-sized companies in bioscience, advanced manufacturing or information technology. This helps to offset the financial portion of intern wages. <https://www.iowaeconomicdevelopment.com/student>

STEM INTERNSHIP PROGRAM

The Science Technology Engineering and Mathematics (STEM) Internship program provides grants to Iowa companies that offer internships to students of Iowa community colleges, private colleges, regents universities or to students who graduated from an Iowa high school and attend a college or university outside of Iowa. <https://www.iowaeconomicdevelopment.com/stem>



*Recruit students for a
co-ops and internships at
the College of Engineering
career fairs on campus.*

Starting and Executing an Experiential Education Program

Starting and executing an experiential education program is a very manageable process and Engineering Career Services is available to help make your program as effective as possible. Hiring and hosting a co-op or an intern student is not much different than hiring and employing a regular employee. The main difference is that there needs to be a learning and development component to the work, the supervisor must perform an assessment of the student's competencies, and the student will return to campus at the completion of the work term.

PRE-EMPLOYMENT ACTIVITIES

- Identify a coordinator to work with ISU College of Engineering.
- Contact ISU Engineering Career Services to discuss your desire to establish a program.
- Decide upon your requirements and needs. The co-op and internship coordinator can assist in identifying tasks and activities that would be appropriate for students at different levels.
- The responsibilities in your job description should provide meaningful and challenging learning experiences for the student. It may be helpful to review the academic curriculum in the respective engineering department.
- Create work assignments and learning objectives:
 - Define the objectives of the work assignment and the expected deliverables. Prepare a document that captures key information about the work assignment. The information should include a description of the position, responsibilities and duties, competencies, and skill sets or coursework needed to perform the assignment.
 - Determine the length of the work assignment and develop a work plan that will provide project work for the duration of the term. Set realistic deadlines to encourage the efficient use of time and project management skills.
 - Identify staff members who will be working with the student and be certain they each understand the objectives of the program and the specific work assignments. It's important to predefine the reporting relationships between the supervisor, other staff members, and the student employee, so that the student employee has a clear understanding of the structure of the organization and can direct questions appropriately.
- Develop a detailed job description.
- Post the job opportunity on ISU's online Career Management System (CyHire). Interested candidates will upload their resumes for consideration.
- Interview candidates. Candidates may be screened and interviewed at the Engineering Career Fair, in the college's interview suites, via phone, or at your organization. Engineering Career Services will gladly facilitate on-campus recruiting.
- Hire a co-op or internship student and pay at least minimum wage.
- Arrange a start and ending date, and provide all necessary information to the new student employee.
- Assist with travel and housing arrangements if necessary.

EMPLOYMENT ACTIVITIES

- Provide an orientation to your company. It is recommended that the same type of on-boarding and training process offered to your other employees be offered to your new student employee. You'll find tips on orienting and supervising your student employee following.
- Provide a safe work and harassment-free environment that is conducive to learning.
- Review and revise work assignments and objectives in collaboration with the student employee. In the first weeks of the work experience, develop performance goals with your student. Review the key competencies in Appendix 1 and try to include opportunities to develop these during the work period.
- Provide regular coaching and feedback.
- Require the student to provide written and/or oral reports on work projects.
- Evaluate your student. At the conclusion of the work period, evaluate the student's performance relative to the established goals as part of your overall evaluation process.
- Complete the required College of Engineering competencies survey of the student as instructed by Engineering Career Services. This survey is required for the student to receive a satisfactory 'S' grade. No letter grade is assigned and the results of the survey are kept confidential between the supervisor and the student.
- Discuss the survey results with the student to provide additional feedback and coaching.
- Conduct an exit interview to collect feedback on the student's work experience.

POST-EMPLOYMENT ACTIVITIES

- Send the student employee back to campus feeling positive about the work experience so he or she can be an ambassador for your company.
- Stay in contact with the student and provide information about future employment opportunities.



Employer Best Practices

Based on student feedback and observations, we suggest the following list of best practices:

- Conduct the program with enthusiasm.
- Provide the student employee with an orientation to the company.
- Clearly communicate performance expectations.
- Match the student employee with one or more engineers that can provide adequate review of work and quality mentoring.
- Give the student employee challenging and meaningful engineering-related work.
- Create quality job assignments that are appropriate for the student employee's discipline and level of study.
- Provide a work experience that begins with simpler tasks and minimal responsibility and gradually progress to more complex tasks that involve higher levels of responsibility.
- Encourage team involvement.
- Offer the student employee opportunities to demonstrate and participate in decision making leadership.
- Provide an overall work experience that is broad enough in scope to provide the student employee with exposure to many facets of professional engineering.
- Provide the student employee with ample guidance, supervision, and feedback.
- Treat the student employee as assets with full-time potential.
- Provide an opportunity for the student to meet with someone from the company's executive ranks.
- Maintain professionalism in your relationship with students and expect professionalism in return.
- Comply with all state and federal laws related to employment of student and family right to privacy.
- Complete the survey of the student employee's competencies in the work place to provide feedback for continuous improvement.
- Require the student employee to deliver a written or verbal report summarizing their work or a project they completed. Invite faculty, advisors, and Engineering Career Services to attend if possible.
- Conduct an exit interview to get the student employee's feedback on their experiential education work experience.
- Motivate the student to become a company ambassador upon their return to campus.

Compensation and Benefits

Arriving at a mutually agreeable compensation and benefits package is largely left to the employer and the student worker. The College of Engineering does, however, require that co-op and internship students be paid in an engineering capacity. We recognize the level of pay is dependent on typical considerations such as level of education, grades, skill set, amount of work experience, and other factors.

The College of Engineering does not allow unpaid internship or co-op experience for two reasons:

1. First, the U.S. Department of Labor has six criteria for identifying a learner/trainee who may be unpaid. One of these criteria states that the employer cannot derive any immediate advantage from the activity of the student worker. Engineering students inherently make a contribution to the company as they practice applying their engineering skills.
2. Second, if a student worker is not receiving payment, their employment status is in question and labor laws may not apply to them. It is important that students in experiential learning programs are offered the same protection as regular employees i.e. employment discrimination, harassment, workers' compensation, and other employment related issue.

Salary information for co-op and internship students can be found on the Engineering Career Services website.

www.engineering.iastate.edu/ecs

We find that companies who treat their student employees the same as their regular employees are most successful in converting co-ops and interns to full-time employees. Many companies offer student employees the same benefits they offer their full-time employees plus housing assistance.

Housing:

Employers are encouraged to consider including housing or a stipend to increase the competitiveness of an employment offer. If your facility is located in an area where short-term housing is difficult to obtain, you may need to offer housing assistance to make it possible for students to live within commuting distance.



Developing Student Objectives

The goal of the College of Engineering Experiential Education program is to provide students with opportunities to apply academic knowledge, develop skill sets, and combine academic and practical learning. Having clear performance and learning objectives for the student employee is a very important component of an experiential learning program. We require three to six performance and learning objectives to be developed for each co-op or intern student. This does not require an extensive effort but the time invested will likely be considered time well spent by both the student employee and the supervisor. The following information is offered to help with the development of effective objectives. The best objectives have several characteristics in common.

STUDENT OBJECTIVES ARE:

- **Specific.** That is, they tell how much (i.e., 40%) of what (weight reduction) is to be achieved.
- **Measurable.** Information concerning an objective can be collected, detected, or obtained from data or records.
- **Achievable** but challenging. The student will find the work challenging but it is likely that some or all of the objectives will be accomplished.
- **Relevant** to the mission. The student should have a clear understanding of how the objectives fit in with the overall vision and mission of the team.
- **Timed.** A milestone date and a due date should be set.

EXAMPLE OBJECTIVES STATEMENTS:

- Complete stress analysis calculations of model X crane and produce report by August 15th (milestones: Analysis 25% complete by July 5, Analysis 100% complete by July 25th, Draft report complete by August 5th and final report complete by August 15th.) (Primary skill development: project planning, analysis and communication.)
- Prepare an oral report summarizing the project worked on during the internship and present to team. (Primary skill development: Oral communication skills)
- Conduct mechanical testing to determine the tensile strength difference between materials A through E and document data in technical report. (Primary skill development: project planning and management, analysis, quality control, and communication.)
- Lead team effort to identify and complete one process improvement activity that results in a cost saving or time savings of more than 5% (milestones: hold kickoff meeting by Jan 15th, Identify potential projects by Feb 5th, collect baseline data, analyze process and identify opportunities for improvement by March 20th, evaluate modified process and collect data by April 10th, document improved process, prepare and present report by April 30th. (Primary skill development: teamwork, leadership, project planning, data collection and analysis, quality control, communication.)

Providing Orientation to Policy, Procedures, and Organization Culture

Most people find starting a new job is a bit unsettling and this is especially true for a student just getting started in the professional workplace. Providing a welcoming introduction and proper orientation to your workplace will get any new employee started on the right foot. The following is a list of topics that are commonly addressed in a new employee orientation.

DEPARTMENT INFORMATION

- Parking, restrooms, dining facilities, location of supplies and restricted areas.
- Safety evacuation routes, tornado plan, and safety rules.
- Dress code, vacation/sick attendance and work hours.
- Professional use of phone, computers, and e-mail.
- Benefits information and payroll forms.
- Intellectual property, conflict of interest, and confidentiality forms.
- What to do if there is a concern or issue in the workplace.

SUPERVISOR & STAFF INFORMATION:

- Name of supervisor.
- Work area location of student and supervisor.
- Introductions to other staff members, co-workers and students.
- Reporting relationship and supervisor procedures.
- Other mentors that can provide answers to questions and guidance.

ORGANIZATION CULTURE:

- Company history and philosophy.
- Organizational charts and structure.
- Discussion of organization and/or department goals and objectives.

Roles and Expectations

EMPLOYER ROLES & EXPECTATIONS:

- Provide employment opportunities for students that help them prepare for the professional practice of engineering.
- Develop major learning objectives for each student employee. (See section on developing objectives and/or contact Engineering Career Services for assistance with developing objectives).
- Directly employ students in an engineering capacity.
- Provide an orientation to company policies, procedures, and practices.
- Provide a workplace that complies with all applicable federal and state safety, equal employment opportunity, nondiscrimination, and harassment laws and regulations. Investigate in an expedient and confidential manner any complaints and protect the employee against illegal retaliation.
- Provide supervision by a professional with expertise and educational and/or professional background in the field of the experience.
- The supervisor and/or mentor shall provide regular direction and feedback to guide and advise the student with respect to the development of workplace competencies and performance.
- Sign the Engineering Experiential Education Expectations (See Appendix 2 for the Statement of Expectations document).
- Complete a survey (supervisor and/or mentor) related to the student's development of workplace competencies.

STUDENT ROLES & EXPECTATIONS:

- Enter the program with a clear understanding of desired outcomes.
- Commit to completing the work terms with the employer.
- Conform to standards of professional and ethical conduct.
- Commit to and work to achieve high levels of performance.
- Sign statement of expectations.
- Register for the appropriate course number for your work term in AccessPlus.
- Complete all assignments of the "S" grade requirements.
- Inform Engineering Career Services of any job offers and acceptances.

COLLEGE OF ENGINEERING ROLES & EXPECTATIONS:

- Inform students about the advantages of experiential education programs.
- Provide information to students about various experiential education opportunities with employers.
- Develop new experiential education opportunities for students by working with industry and government employers.
- Coordinate with departmental co-op/intern advisors on the academic components of the program.
- Help employers implement or improve experiential education positions through site visits, workshops, and feedback.
- Maintain records on students and employers.

Using Co-ops and Internships towards PE License Work Experience Requirements

One of the many benefits that a formal co-op internship experience offers engineering students is the ability to apply the work experience toward professional licensure.

The normal path to a PE License Involves:

1. Taking the Fundamentals of Engineering (FE) Examination during the senior year of college.
2. Graduating from a four-year, ABET accredited, engineering program.
3. Starting work and accumulate four years of engineering experience.
4. Taking the Principles and Practice of Engineering (PE) Examination:

<http://www.nspe.org/Licensure/Resources/LandQP.html>.

When a student enrolls in an ISU College of Engineering Cooperative Education or Internship course, it is our intent that they will be provided with work experience that meets the criteria listed above. Additionally, completion of the course is listed on the student's transcript to provide documentation of the institutionally-supervised work experience. Students that do not register their summer internships with Engineering Career Services will not have this documentation and may not be able to show that their internship consisted of qualified work experience.

It is generally required that all of the engineering experience be accumulated after graduation. However, if a student has worked while studying to be an engineer, and if the work meets the criteria for qualifying experience, the student may qualify to take the PE Examination less than four years after graduation. It is important that the candidate be able to show that the pre-graduation experience constitutes qualifying engineering experience. The criteria used to determine whether work experience constitutes qualifying engineering experience is provided to the right.

The National Society of Professional Engineers website:
<http://www.nspe.org/Licensure/Resources/LandQP.html>

QUALIFYING ENGINEERING EXPERIENCE

In order to constitute qualifying experience, the work experience:

1. Should be from a major branch of engineering in which the candidate claims proficiency.
2. Must be supervised. It must take place under the ultimate responsibility of one or more qualified engineers. Generally qualified engineers must be licensed professional engineers. However, some jurisdictions will accept experience supervised by a qualified unlicensed engineer in industry situations where there is no offering of engineering services to the public.
3. Must be of a high quality, requiring the candidate to develop technical skill and initiative in the application of engineering principles and sound judgment in reviewing such applications by others. The experience must be of a nature that the candidate develops the capacity to assume professional responsibility for engineering work.
4. Must be broad enough in scope to provide the candidate with a reasonably well-rounded exposure to many facets of professional engineering. Along with highly specialized skill in a particular branch of engineering, the candidate should acquire an acceptable level of competence in his or her basic engineering field, as well as the accessory skills necessary for adequate performance as a professional.
5. Must progress from relatively simple tasks with less responsibility to work of greater complexity involving higher levels of responsibility. As the level of complexity and responsibility increases, the candidate should show evidence of increasing interest in broader engineering questions and continuing effort toward further professional development and advancement.

The Supervisor

During the work assignment, the student will interact most frequently with his/her immediate supervisor. The supervisor is in a position to strongly influence the student's perception of the working world. The supervisor will continually monitor the progress of the student during the work assignment and address the development of observable competencies in his/her performance.

The supervisor and student often develop a mentoring relationship that emphasizes the need for encouragement and immediate constructive feedback during the student's work assignment.

Supervising a student requires a special skill set, including the following:

- Competency and credibility in the area of expertise being shared with the student.
- Experience and enthusiasm in supervising students who may not have the same level of expertise as a full-time employee.
- An interest in student development and a willingness to train raw talent.
- A desire to become a mentor to the student while establishing a learning environment. The mentor must be able to provide a balance of direct supervision, guidance, and independent learning for the student.
- The time and ability to develop and implement quality work assignments.
- The ability to provide assessment information regarding the student's progress or performance during the work assignment.



Supervisor/Mentor Feedback on Workplace Competencies

The development of workplace competencies is one of the primary goals of experiential education program. Students greatly benefit from the candid feedback they receive from their supervisors and mentors about their professional skills and workplace behaviors. The discussions that take place after a student compares his or her supervisor's and/or mentor's results to his or her own self-assessment provides significant opportunity for growth, and a better understanding of strengths and weaknesses.

Near the end of the co-op or internship work-term, supervisors and/or mentors will be asked to complete an online survey of the student's competencies. The survey focuses on the 15 competencies included in Appendix 1, which were developed from employer input on the qualifications that they seek in new graduates. For each competency, there are several questions about actions that the co-op or intern worker may have demonstrated in the workplace. After supervisors/mentors complete their surveys and the student completes their own self-assessment survey, a comparison report is generated for the student. The students are then asked to meet with the supervisors and mentors to discuss the results.

The purpose of this assignment is to help the students understand their strengths and identify opportunities for improvement with candid feedback, so the feedback results have no bearing on student grades. However, completion of this assignment is required for the student to receive a passing grade. Aggregated data is used by the College for continuous improvement activities and to help show that the student learning outcomes required for ABET accreditation are being met.

At the appropriate time, supervisors and mentors will receive an email from ecscoop@iastate.edu with a link to the online, Qualtrics 360 survey tool.

The screenshot displays a Qualtrics survey interface. At the top, there is a navigation bar with the Qualtrics logo, a 'My Projects' tab, and a 'Tasks: 2017 Spring Engr. Competency Survey' tab. Below the navigation bar, there is a 'Evaluate Connor Nolting' button. The main content area shows a table with columns for 'Never', 'Rarely', 'Sometimes', 'Most of the time', 'Always', and 'N/A Have not had opportunity to observe'. The table contains several rows of competency questions, each with radio buttons for selection. The first row is 'Identifies issues, problems, and opportunities - Recognizes issues, problems, or opportunities and determines whether action is needed.' The second row is 'Gathers information - Identifies the need for and collects information to better understand issues, problems, and opportunities.' The third row is 'Interprets information - Integrates information from a variety of sources; detects trends, associations, and cause-effect relationships.' The fourth row is 'Generates alternatives - Creates relevant options for addressing problems/opportunities and achieving desired outcomes.' The fifth row is 'Chooses appropriate action - Formulates clear decision criteria; evaluates options by considering implications and consequences; chooses an effective option.' The sixth row is 'Commits to action - Implements decisions or initiates action within a reasonable time.' The seventh row is 'Involves others - Includes others in the decision-making process as warranted to obtain good information, make the most appropriate decisions, and ensure buy-in and understanding of the resulting decisions.' The eighth row is 'Values diversity - Embraces and values diverse collection of inputs, values, perspectives, and thought paradigms in approaching the application of engineering to products and processes.

	Never	Rarely	Sometimes	Most of the time	Always	N/A Have not had opportunity to observe
Identifies issues, problems, and opportunities - Recognizes issues, problems, or opportunities and determines whether action is needed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gathers information - Identifies the need for and collects information to better understand issues, problems, and opportunities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interprets information - Integrates information from a variety of sources; detects trends, associations, and cause-effect relationships.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Generates alternatives - Creates relevant options for addressing problems/opportunities and achieving desired outcomes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Chooses appropriate action - Formulates clear decision criteria; evaluates options by considering implications and consequences; chooses an effective option.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Commits to action - Implements decisions or initiates action within a reasonable time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Involves others - Includes others in the decision-making process as warranted to obtain good information, make the most appropriate decisions, and ensure buy-in and understanding of the resulting decisions.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Values diversity - Embraces and values diverse collection of inputs, values, perspectives, and thought paradigms in approaching the application of engineering to products and processes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

Frequently Asked Questions

1. When do most students start co-ops or internships?

Students can start a co-op or internship after they have completed one semester of coursework at ISU. Some companies hire freshmen to establish an early relationship, but most companies hire sophomores, juniors and seniors that have completed some of their core engineering courses.

2. What is the difference between a co-op and an internship?

The difference is in the duration of the work experience. Co-ops are a semester or a semester and a summer of work experience with the same company. Internships are at least 10 weeks during the summer. They are both institutionally supervised periods of work experience intended to primarily advance the student's academic and professional development.

3. Do we have to offer all forms of the Experiential Education Program?

No. The decision to offer a student a co-op or an internship position lies with the employer.

4. Can a student have more than one Experiential Education experience?

Yes, there is no limit on the number of co-ops or internships a student can complete. Work terms must alternate with academic study (i.e. students cannot work back-to-back spring/fall or fall/spring semesters).

5. Do companies have to provide housing to students?

No, but employers are encouraged to consider including housing or a stipend to increase the competitiveness of their employment offer. If your facility is located in an area where short-term housing is difficult to obtain, you may need to offer housing assistance to make it possible for students to live within commuting distance.

6. Am I obligated to hire the student full-time after graduation?

No, neither students nor employers are obligated to continue the employment relationship after graduation. However, many employers do extend offers of full-time employment to their co-op/intern students when they graduate.

7. What is the average starting salary for interns?

Salary information can be found on our web site at: <http://www.engineering.iastate.edu/ecs/employers/salaries-demographics/>

8. What if a student isn't performing well during a co-op or internship?

The employer is encouraged to work with the student employee to improve his or her performance, as would be done with a full-time employee. However, the employment relationship between the company and the student employee is 'At Will Employment' and can be terminated by either party at any time and for any reason. Should this happen, please contact Engineering Career Services.

9. Does the supervisor have to complete the competency survey if our company has their own assessment process?

Yes, the competency survey must be completed by one or more supervisors/mentors for several reasons: First, the OPAL assessment provides students with feedback on the key competencies that the College has identified for our students. Second, the data is aggregated and used by the College in its ABET accreditation and continuous improvement processes.

10. Is it necessary to sign the Experiential Education Statement of Expectations?

Yes, this statement simply makes sure all parties are aware of what is expected of them. The form must be on file with Engineering Career Services before we will allow a student to register their co-op or internship course.

Appx 1. Key ABET Competencies for Development

The Accreditation Board for Engineering and Technology (ABET) states that, “To be considered for accreditation, engineering programs must prepare graduates for the practice of engineering at the professional level.” At Iowa State University, we use co-op and intern supervisor assessment data in aggregate form to assure that our students are developing the required competencies. The following competencies have been identified by the ISU College of Engineering as being very important in the workplace, and therefore, key to student success. The student self-assessment and the supervisor’s assessment of the student employee will focus on these competencies.

ENGINEERING KNOWLEDGE:

Having achieved a satisfactory level of knowledge in the relevant specialty areas of mathematics, science, and engineering. Key actions include knowledge of:

- **Mathematics** - Demonstrates a knowledge of the mathematical principles required to practice engineering in one’s specialty area.
- **Science** - Demonstrates a knowledge of the scientific principles required to practice engineering in one’s specialty area.
- **Experimental design and analysis** - Demonstrates a knowledge of the principles of experimental design and data analysis in one’s specialty area.
- **Current engineering tools** - Demonstrates a knowledge of the use of contemporary tools needed to practice engineering in an effective manner.
- **Engineering** - Demonstrates a knowledge of engineering principles required to practice in one’s specialty area.

GENERAL KNOWLEDGE:

Having achieved a satisfactory level of knowledge outside the areas of mathematics, science, and engineering. Key actions include:

- **General knowledge** - Demonstrates a knowledge of important current issues and events outside the areas of mathematics, science, and engineering.
- **Relates general knowledge to engineering** - Demonstrates a knowledge of the interrelationships between important issues and events outside of engineering and one’s engineering specialty area.

CONTINUOUS LEARNING:

Actively identifying new areas for learning; regularly creating and taking advantage of learning opportunities; using newly gained knowledge and skill on the job; and learning through application. Key actions include:

- **Targets learning needs** - Seeks and uses feedback and other sources of information to identify appropriate areas for learning.

- **Seeks learning activities** - Identifies and participates in appropriate learning activities (e.g., courses, reading, self-study, coaching, experiential learning) that help fulfill learning needs.
- **Maximizes learning** - Actively participates in learning activities in a way that makes the most of the learning experience (e.g., takes notes, asks questions, critically analyzes information, keeps on-the-job application in mind, completes required tasks).
- **Applies knowledge or skill** - Puts new knowledge, understanding, or skill to practical use on the job; furthers learning through trial and error.
- **Takes risks in learning** - Puts oneself in unfamiliar or uncomfortable situation in order to learn; asks questions at the risk of appearing foolish; takes on challenging or unfamiliar assignments.

INITIATIVE:

Taking prompt action to accomplish objectives; taking action to achieve goals beyond what is required; being proactive. Key actions include:

- **Responds quickly** - Takes immediate action when confronted with a problem or when made aware of a situation.
- **Takes independent action** - Implements new ideas or potential solutions without prompting; does not wait for others to take action or to request action.
- **Goes above and beyond** - Takes action that goes beyond job requirements in order to achieve objective.

QUALITY ORIENTATION:

Accomplishing tasks by considering all areas involved, no matter how small; showing concern for all aspects of the job; accurately checking processes and tasks; being watchful over a period of time. Key actions include:

- **Follows procedures** - Accurately and carefully follows established procedures for completing work tasks.
- **Ensures high-quality output** - Vigilantly designs and/or watches over job processes, tasks, and work products to ensure freedom from errors, omissions, or defects.
- **Takes action** - Initiates action to correct quality problems or notifies others of quality issues as appropriate.

INNOVATION:

Generating creative, non-traditional engineering solutions in work situations; trying different and novel ways to deal with work problems and opportunities. Key actions include:

- **Challenges paradigms** - Identifies implicit assumptions in the way problems or situations are defined or presented; sees alternative ways to view or define problems; is not constrained by the thoughts or approaches of others.
- **Leverages diverse resources** - Draws upon multiple and diverse sources (individuals, disciplines, bodies of knowledge) for ideas and inspiration.
- **Thinks expansively** - Combines ideas in unique ways or makes connections between disparate ideas; explores different lines of thought; views situations from multiple perspectives; brainstorms multiple approaches/solutions.

- **Evaluates multiple solutions** - Examines numerous potential solutions and evaluates each before accepting any one solution.
- **Ensures relevance** - Targets important areas for innovation and develops solutions that address meaningful work issues.

CULTURAL ADAPTABILITY:

Being open to and making changes to accommodate the differences found in other cultures in order to interact effectively with individuals and groups from a different cultural background. Key actions include:

- **Demonstrates inclusive behavior** - Establishes effective relationships with people of other cultures and backgrounds; shows genuine acceptance of people from backgrounds different from one's own.
- **Exhibits sensitivity** - Exhibits sensitivity to and respect for the perspectives and interests of people of a different culture; attends to and tries to understand different perspectives and approaches.
- **Adapts behavior to other culture** - Adjusts own interactions, communications, and decision making to be appropriate and effective within another culture without sacrificing own values.
- **Adapts products and processes to cultural concerns** - Identifies, understands, and incorporates cultural factors into the design of products and processes.

ANALYSIS & JUDGMENT:

Identifying and understanding issues, problems, and opportunities; developing the relevant criteria and comparing data from different sources to draw conclusions; using effective approaches for choosing a course of action or developing appropriate solutions; taking action that is consistent with available facts, constraints, and probable consequences.

Key actions include:

- **Identifies issues, problems, and opportunities** - Recognizes issues, problems, or opportunities and determines whether action is needed.
- **Gathers information** - Identifies the need for and collects information to better understand issues, problems, and opportunities.
- **Interprets information** - Integrates information from a variety of sources; detects trends, associations, and cause-effect relationships.
- **Generates alternatives** - Creates relevant options for addressing problems/opportunities and achieving desired outcomes.
- **Chooses appropriate action** - Formulates clear decision criteria; evaluates options by considering implications and consequences; chooses an effective option.
- **Commits to action** - Makes decisions within a reasonable time.
- **Involves others** - Includes others in the decision-making process as warranted to obtain good information, to make the most appropriate decisions, and to ensure buy-in and understanding of the resulting decisions.
- **Values diversity** - Embraces and values diverse collection of inputs, values, perspectives, and thought paradigms in approaching the application of engineering to products and processes.

PLANNING:

Effectively managing one's time and resources to ensure that work is completed efficiently.

Key actions include:

- **Prioritizes** - Identifies more critical and less critical activities and tasks; adjusts priorities when appropriate.
- **Makes preparations** - Ensures that required equipment and/or materials are in appropriate locations so that own and others' work can be done effectively.
- **Schedules** - Effectively allocates own time to complete work; coordinates own and others' schedules to avoid conflicts.
- **Leverages resources** - Takes advantage of available resources (individuals, processes, departments, and tools) to complete work efficiently.
- **Stays focused** - Uses time effectively and prevents irrelevant issues or distractions from interfering with work completion.

TEAMWORK:

Effectively participating as a member of a team to move toward the completion of goals. Key actions include:

Key actions include:

- **Facilitates goal accomplishment** - Makes procedural or process suggestions for achieving team goals or performing team functions; provides necessary resources or helps to remove obstacles to help the team accomplish its goals.
- **Involves others** - Listens to and fully involves others in team decisions and actions; values and uses individual differences and talents.
- **Informs others on team** - Shares important or relevant information with the team.
- **Models commitment** - Adheres to the team's expectations and guidelines; fulfills team responsibilities; demonstrates personal commitment to the team.

SAFETY AWARENESS:

Identifying and correcting conditions that affect employee safety; upholding safety standards. Key actions include:

- Identifies safety issues and problems.
- Takes corrective action.
- Monitors corrective action.

COMMUNICATION:

Clearly conveying information and ideas through a variety of media to individuals or groups in a manner that engages the audience and helps them understand and retain the message.

Key actions include:

- **Organizes the communication** - Clarifies purpose and importance; stresses major points; follows a logical sequence.
- **Maintains audience attention** - Keeps the audience engaged through use of techniques such as

analogies, illustrations, body language, and voice inflection.

- **Adjusts to the audience** - Frames message in line with audience experience, background, and expectations; uses terms, examples, and analogies that are meaningful to the audience.
- **Ensures understanding** - Seeks input from audience; checks understanding; presents message in different ways to enhance understanding.
- **Adheres to accepted conventions** - Uses syntax, pace, volume, diction, and mechanics appropriate to the media being used.
- **Comprehends communication from others** - Attends to messages from others; correctly interprets messages and responds appropriately.

INTEGRITY:

Maintaining social, ethical, and organizational norms; firmly adhering to codes of conduct and professional ethical principles. Key actions include:

- **Demonstrates honesty** - Deals with people in an honest and forthright manner; represents information and data accurately and completely.
- **Keeps commitments** - Performs actions as promised; does not share confidential information
- **Behaves consistently** - Ensures that words and actions are consistent; behaves consistently across situations.

PROFESSIONAL IMPACT:

Creating a good first impression; commanding attention and respect; showing an air of confidence. Key actions include:

- **Dresses appropriately** - Maintains a professional, businesslike image consistent with the workplace environment.
- **Displays professional demeanor** - Exhibits a calm appearance; does not appear nervous or overly anxious; responds openly and warmly when appropriate.
- **Speaks confidently** - Speaks with a self-assured tone of voice.

CUSTOMER FOCUS:

Making customers and their needs a primary focus of one's actions; developing and sustaining productive customer relationships. Key actions include:

- **Seeks to understand customers** - Actively seeks information to understand customers' circumstances, problems, expectations, and needs.
- **Educates customers** - Shares information with customers to build their understanding of issues and capabilities.
- **Builds collaborative relationships** - Builds rapport and cooperative relationships with customers.
- **Takes action to meet customer needs and concerns** - Considers how actions or plans will affect customers; responds quickly to meet customer needs and resolve problems; avoids over commitments.
- **Sets up customer feedback systems** - Implements effective ways to monitor and evaluate customer concerns, issues, and satisfaction and to anticipate customer needs.

Experiential Education

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