



COOPERATIVE EDUCATION SUPERVISOR’S MANUAL
Cooperative & Experiential Education Division (CEED)
Of The
American Society for Engineering Education (ASEE)

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Introduction

Employers may enjoy working with a variety of academic institutions in developing a strong co-op program. One of the realities of this experience is that even among colleges and universities, the definition of ‘co-op’, or cooperative education, may vary. Depending on the university and program structure, the Co-op experience may/may not be for university credit in addition to being a paid opportunity for the student. Many Co-op programs prefer the student perform the Co-op term as two consecutive experiences; Spring Semester/Summer or Summer/Fall Semester. Depending on the university structure participation in a Co-op Program may/may not be required of the engineering student and may/may not be for credit. It is best to check with each college or university to determine how their programs operate. It is certainly viable for companies to work with different types of schedules and program. Understand that not all universities offer co-op programs, and if they do, the student must register with the university’s co-op office, or else it will not be reported as such on the student’s transcript.

For a good definition of co-op, we recommend that you look at the attributes of cooperative education in the link below. These attributes were published by the Accreditation Council for Cooperative Education and encompass what most schools and employers aspire to when running a quality program. As you will see, there are several types of programs.

<http://www.co-opaccreditation.org/attributes.htm>

Additionally, the American Society of Engineering Education's Cooperative and Experiential Education Division (CEED) publishes biannually a Directory of both co-op and intern programs. Intern programs are typically for one term, usually the summer, and cooperative education programs are multi-rotational and considered more academic in nature. The directory of the 2012-2013 programs can be downloaded in a high-quality print at the ASEE/CEED website:

<http://ceed.asee.org/>

The intent of this Cooperative Education Supervisor's Manual is to provide clarity of understanding what a Co-op is, what the relationship should be providing for both the employer and the practicing student, and to provide some guidelines to mature as well as new organizations, in providing engineering students with the extremely valuable experience as a Co-op.

History of Cooperative Education

Cooperative Education was founded over 100 years ago at the University of Cincinnati by Engineering Dean Herman Schneider. Schneider felt that in addition to academics, a more hands-on approach was needed to graduate successful engineers. The impact of his program at Cincinnati resulted in hundreds of colleges implementing their own programs, in many fields of study. Cooperative Education in engineering is defined as a structured program that facilitates industry experience where the practice of engineering tools and studies are further developed under "real life" experiences.

According to H.P. Hammond, president of the Society for the Promotion of Engineering Education (forerunner of the American Society of Engineering Education) in 1936-37, "The most noteworthy single development in engineering education in this country since 1893 was the establishment, in 1906, of the cooperative system. We owe the establishment of this plan to the vision, the initiative, the resourcefulness and the energy of one man, Dean Herman Schneider...from small beginnings at Cincinnati, the cooperative plan spread rapidly. In 1909 it was adopted at Northeastern, in 1910 at Pittsburgh, in 1912 at Georgia Tech, in 1914 at Akron, and in 1915 at the University of Detroit."

The concept of cooperative education has not changed all that much over the last century. Most students alternate in some fashion between academics and work, with the work component increasing in scope as do the student's academics. Because most institutions view the co-op program as part of the curriculum, it is best to check with your academic partners to determine how their program works.

Creating a Successful Partnership

Traditionally, co-op programs have been recognized as a “triangular relationship”; the employer, university and student are all equal partners in a venture that promises fulfillment for those involved. Employers see the program as a cost-effective recruitment tool. Over the period of several semesters, they can gauge the progress, efforts, and contributions of their co-ops. Most employers use the co-op program as a means of hiring new talent. The best part might be that they are hiring new talent that has been trained by their very own personnel! Many students will choose elective coursework directly related to their role at the co-op company. For instance, they might decide to specialize in an area because of the industry or interests they have developed during their co-op.

Students want the experience and many are eager to put their academic background to the test. They are anxious to contribute and want to be a professional member of the team. Most students tell us that being challenged is their number one goal in obtaining a co-op; therefore, it is important that the student has a mentor or supervisor who is engaged with the success of the program and who has put some forethought and planning into the assignments.

If a supervisor is not available or does not seem willing to assist, the outcome might be a less than valuable experience for both the student and the employer. If an employer has a retention issue, it might be for lack of guidance and relevant work. The best co-op programs have support from the top down within the organization.

The university values its partnership with both the student and employer. The student will tend to perform better academically, become successful, and prove to be active alumni. Employer relations tend to strengthen through co-op programs, because each has a direct involvement with the success of the graduate. Most colleagues would state that the main ingredient for success in working with their employers is communication. Keeping the co-op coordinator in the loop regarding students who have been interviewed or hired is very important, particularly as co-op is viewed as an academic program and there may be some additional preparation or requirements on the student versus a student who only works a summer term.

Please maintain the university's program policies, and if in doubt, please ask your co-op coordinator. A good co-op program will have standards involving the co-op schedules, working hours, and expectations for each student. Don't ever hesitate to ask.

Additionally, if there are any work issues involving the student, feel free to contact your university co-op coordinator. Because of the academic status of the program, you will be able to work together to hopefully ensure the success of the student.

Hiring a Co-op Student

It is important to work with the university when hiring a co-op. Let them know your criteria and the co-op office can circulate the position for you and send qualified candidates. Many companies also have the students apply on-line; in these cases it is good practices to have the co-op office inform the employer as to which students applied so that those applications can be retrieved. Many universities will also have job fairs where co-ops can be hired.

When discussing a Co-op opportunity with a student, the employer must be clear about the offering and the student about their qualifications, availability and interests. Following are some of the key areas to be addressed during an interview / offer for a Co-op. This is not intended to all inclusive as there are as many variations in details as there are Co-op opportunities. The importance is to cover the most important to your organization.

Employer

1. Position Description including potential projects
2. Period(s) of performance
3. Dates (start / finish – flexibility)
4. General (specific if possible) responsibilities
5. Employer performance expectations
6. Salary, including payment schedules
7. Daily work schedule
8. Dress Code and corporate culture
9. Performance reviews
10. Tools and supplies
11. Relocation assistance / housing, transportation ...per semester if not concurrent or one time offering
12. Reporting structure
13. Rotation opportunities

14. Conversion to hire opportunities
15. Credit verses non-credit (depends on the university), transcript documented or not
16. Feedback and letters of recommendations
17. Vacation/Holiday allowance, sick days, appointments

Student

1. Availability – start/ end dates - flexibility
2. Areas of interest / Assignment preferences
3. Qualifications and capabilities
4. Relevant past experiences
5. Interest in long-term employment verses single experience
6. Relocation assistance expectations...per semester if not concurrent or one time offering
7. Location(s) preference or limitations
8. Outside interests (social)
9. Credit verses non-credit requirements, including transcript eligibility
10. Time off expectations
11. Work schedule (shift, hours, overtime ...)
12. Desire and/or ability to travel during the co-op

When tendering an offer, please be aware that a student may be going through several interviews at once. Sometimes employers want an answer that very day and even though the student might be quite interested, he or she may want to complete other interviews before accepting. We recommend giving the student at least a few days to make a decision. We also recommend that you give the student a deadline date for that decision. We also encourage employers not to wait until the last minute to tender an offer, as the students may not be available at that point. Again, please work closely with each university in determining the timeline.

It is also recommended to keep the university co-op liaison apprised if you have hired a student from their school. Because of the academic component to the program, most schools will require a documented experience related to the student's field of study. You will most likely need to evaluate the student as well. Financial remuneration would be expected in an engineering co-op. Most schools can offer information on the current average co-op salaries.

Employers should also consider an ambassador program for active co-ops once they are back on campus. These students can play a great role by increasing visibility of your organization.

Try-Them-Out – It Goes Both Ways

This is a two-way opportunity. A student's résumé and qualifications doesn't always represent the actual ability or interest of the student to participate in a work situation. Companies in cooperation with universities collaborate during the recruitment process of graduating engineers to do their best to ensure a good fit, however the hiring process of an "unknown" quantity in a graduate can be an expensive proposition.

Just as important, the representation of a company to the student through social media or on-campus Career Fairs and interviews generally paints a beautiful picture of the company setting which may unintentionally be different than the expected culture or opportunity once the new graduate shows up to work. This disappointment and cost of lost revenue when new graduates don't work out, or leave on their own, disrupts the work-force, costs a lot to replace the employee, and creates bad will between the former employee and the company.

The co-op experience provides both the company and the student an opportunity to learn, grow and evaluate each other under a temporary assignment and affords both the choice of long-term consideration at the end of the co-op period. When the co-op student receives a formal offer, they will know if the opportunity is one they would be satisfied working for a significant period of time and brings an understanding of culture and expectations to day one of the full-time employment. At the same time, the company will have a good assessment of the student's abilities, values and fit in the culture of the organization, providing a much better assessment of future success as an employee.

Mentoring and Coaching

Critical to the success of an Internship or Co-op experience is not just the daily performance, rather the growth and development of the student during a positive experience. Because the cost of hiring and replacing human capital is a growing expense for a corporation and since the experience is to "try out" both entities, it is important that experience be as positive as possible. To ensure the experience is "all that it can be" there must be mentoring and coaching of the student participant in the program. The employer should solicit internal volunteers of high merit to serve as mentors and coaches during the co-op assignments. These relationships alone can create a long lasting bond and foster greater engagement of current employees as well as the co-op student.

The support for the student participant can come from different areas of the organization and the recommendation is that each search and acquires as many mentors / coaches possible.

1. Someone in a leadership role - often a manager in the Co-op Intern Program leadership team
2. Assignment manager or assignment lead engineer - technical support
3. Peer mentor - most often a recent graduate in the same or similar discipline
4. Human Resource contact for personal issues, procedural questions and work related concerns

The best co-op positions are those where the students are utilized to the fullest and where the student feels that he or she is part of the team and part of the company culture. Being productive and making a difference ensures that the co-op student will become integrated into the organization and enhance the experience. Some companies will host luncheons or after-hour socials to assist in the professional and social development of the student. Yes, co-op is a commitment, but a commitment with a big payoff. Generally over 50% of the co-op students receive full-time offers from their companies at graduation, and 80-90% generally accepts those offers.

Values and beliefs of a Cooperative Education to the Corporation/Business

Corporations participate in Cooperative education experiences for several reasons and should consider each of these when embarking on developing / participating in a Co-op relationship with universities and students. There are several advantages to having Co-op students flowing through the workforce, one of which is the creation of a government security cleared talent pool. Successful and long-term relationships with a university and employer increase the value of the experience as well as the likelihood there will be successful matches and long-term hires for the corporation.

Creating a Temporary Workforce

One of the most beneficial uses of co-op students for a company is that students provide an educated temporary work-force to fill the void during uptakes in the business environment and diminishes the need for layoffs and force reductions during weaker economic times. Having relationships with universities for this readily available source of talent can efficiently fill open positions on a short term basis. The company can increase and decrease the level of participation based on the needs and projections.

Balanced Education & a Dose of Reality

Many universities provide hands-on labs and experiences for the developing student and some have strong curriculum based in a Project Based Learning (PBL) philosophy, supplemented by student groups

and industry sponsored projects. The opportunity for a student to experience the "real-world" experience of working for a living is critical to maintaining student interest in the difficult pursuit of engineering as well as provide valuable insight into the true working environment. Corporations must provide these experiences outside the classroom to establish the connection between the book-learning and practical application. This process will allow the needs of corporate America to be met long-term and integration of the new grad into the corporate family will go smoother and produce more productive and engaged employees.

In addition, some companies will engage themselves in professional development programs on campus to assist students in preparing a quality résumé, and developing enhanced interviewing skills. The partnerships are plentiful leading to technical support on campus; relevant industry based sponsored student projects, membership on Industry advisory boards and funding for the student activities and scholarships.

The work environment allows the students to see practical applications of the classroom studies and realizes that although the technical training is similar, the application and expectations in the work environment differ greatly from the classroom experiences. Despite the outstanding content developed in the classroom, the results of experience in industry clearly demonstrates there is no one solution to an engineering problem and the need for many models and trial-and-error methods must occur before a design becomes stable. In addition the co-op realizes that understanding of cross-organizational interface and communication must become a daily element to guarantee a safe and viable product can be produced in sufficient quantities, at an affordable price to entice customers to buy the products developed by engineers. No longer is the engineer allowed to design and develop in a vacuum.

The corporate participant in these programs assumes the responsibility of providing valuable and enriching work experiences as continued encouragement to the student in their pursuit of a STEM education. Providing a variety of experiences demonstrates the flexibility and variety of challenges that exist once the engineering student graduates and joins the world of advancing technology.

An internship or co-op assignment affords the engineering student to experience the expectations of the corporation of the student:

1. Work schedule
2. Time charging
3. Training opportunities

4. Work/life balance
5. Ethics
6. Collaboration and teamwork
7. Culture
8. Cross department relationships
9. Proper use of tools and equipment
10. Reporting structures / mentoring
11. Volunteer / outside activities
12. Corporate / site processes and procedures
13. Safety Practices

Employer Expectations

During a strong and meaningful Internship or Co-op experience the student participant should expect the following from the employer:

1. Introduction to the organization and a smooth on-boarding experience
2. Introduction to assignment manager and assignment expectations
3. Opportunities to experience multiple areas of the assignment interfaces
4. Participation in group meetings and discussions
5. Proper tools, equipment and a desk upon arrive to assignment
6. Human Resource and technical contact lists
7. Key process locations
8. Assignment expectations, weekly feedback and end of assignment review
9. Consistent oversight and mentoring

Since a Co-op experience is a longer term obligation for both the student and the employer, the following expectations should be discussed early during the extended assignment:

1. Work-day schedule
2. A dedicated space for the student with a desk and computer
3. Flexible / non-flexible time
4. Vacation / holiday policy/Inclement weather
5. Benefits discussion (Health Insurance or not), service accrual
6. Performance expectations

7. Feedback
8. Final review and potential to be hired upon graduation
9. Next steps upon completion of co-op experience

Summary

The Cooperative and Experiential Education (CEED) Division of the American Society for Engineering Education (ASEE) is pleased to offer an introduction to key elements and benefits of creating and maintaining a Cooperative Education Program in engineering with industry, and to highlight some of the important considerations when integrating students into the workforce during their undergraduate and graduate pursuits prior to becoming full-time employees in the corporate world.

We have offered a brief look at the history of Co-op education, basic principles and critical elements in the work environment, to ensure a more successful relationship between students and corporate managers. Due to the different engineering curriculum at a broad range of engineering universities in addition to the diverse organizations and needs of the corporate partners, we do not offer a prescription of success, rather recommendations of critical elements describing relationships and program development considerations to enhance the co-op experience. We believe implementing these suggestions and considerations into new and existing programs will lead to greater engagement and increased development of the student's knowledge through co-op experiences.