

Kettering

UNIVERSITY

Culminating Undergraduate Experience
Co-op Thesis Project
Cooperative Employer Manual

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OVERVIEW

Our Mission . . .

To provide Kettering students with a culminating undergraduate experience, combining curriculum and work experience into a significant REAL WORLD professional project.

What is a Co-op Thesis?

Kettering's Culminating Undergraduate Experience program, better known as the thesis project, is an opportunity for the student to use his/her learned knowledge to perform a major project for the co-op employer. The student and co-op employer identify a suitable company-oriented problem and a member of the Kettering faculty approves the project and is designated as the Faculty Thesis Advisor. The student will then perform the project during one co-op term followed by writing a comprehensive report describing his/her work during the following co-op term. The student should be allowed at minimum 50% of their time during these two co-op terms to work on the thesis project. Upon completion, the report, his/her thesis, is evaluated by both the Employer Thesis Advisor and the Faculty Thesis Advisor.

Purpose of the Thesis . . .

Students execute and manage a comprehensive project from its inception to its conclusion. The focus of this project may be a product or a system. The student must produce a technical document, the written thesis, reporting on the students' performance and project outcomes.

Expectations of the Thesis Student . . .

- Work in conjunction with their employing company to identify a problem and the important parameters of the project.
- Plan a solution strategy and map it out with the agreement of the Employer and Faculty Thesis Advisor.
- Conduct appropriate research, experimentation, design work and investigation.
- Prepare a major written report describing the project, the solution methodology and the conclusions and recommendations.
- Meet the deadlines associated with the student's graduation term. (see student timeline on page 9)

Benefits to the Employer . . .

A number of our co-op employers have contended that the thesis project provides them a distinguished opportunity to evaluate the student's performance prior to graduation, which could determine if the student has a future with the company. As well, many thesis students have saved their companies a significant amount of money or have contributed to process improvements and utilizing new techniques or ideas.

GETTING STARTED

The **first** step for a student is to enroll in and attend the **CUE Introductory Course** (CUE-495). This is a required class for all students during their junior one term. This introductory course provides an opportunity to share important information pertaining to the Culminating Undergraduate Experience for students approaching their thesis requirement. All aspects of the CUE are covered. Every week, a different topic is explored, analyzed, and discussed. Students are prepared for their thesis requirement through understanding of their options, guidance for creating/managing a successful timeline, participation in writing workshops, and familiarity of the various available resources. Furthermore, topics in project management, oral & written communication, professionalism, presentation skills, and personal marketability are explored to assist student transition from undergraduate studies to the professional world, which is a basic goal of the CUE requirement. A majority of the students will return to work the following term and determine with his/her employer advisor if the Co-op Thesis is an acceptable option and if so, determine a topic to submit their Proposed Thesis Assignment (PTA) in KqUest that term or the following work term. Note: If the Co-op Thesis isn't deemed a good fit for the company, then with company approval the next academic term (Junior II academic term), the student will contact CCUE to find another CUE option to pursue.

The **second** step is the **Topic Selection Process**. The student's thesis topic should be one that is mutually agreed upon by the employer and the student. Many times, topics are initiated by managers in the work area where the student is currently working, however, thesis projects can be performed in any area of the company. Please note: Kettering University does not identify or select Co-op Thesis project topics. Kettering University evaluates and approves proposed topics using the criteria below, but the projects are selected by the student and employer.

Thesis Topic Criteria:

- Is the project of value to the co-op employer?
 - Will it solve an existing problem?
 - Will it result in cost savings, improved quality, increased productivity, increased reliability, or improved serviceability?
 - Is it important enough to be made a significant part of the student's workload during two co-op terms?
- Will the project provide an opportunity to demonstrate competence in the student's field of study?
 - Does it involve some valid engineering design content (for engineering students)?
 - Does it require an engineering, business and/or science background to perform so that the student can demonstrate his/her ability to apply that background?
 - Is it related to the student's previous cooperative work experiences?
 - Will it allow the student to demonstrate creativity, planning skills and independent thinking?
 - Will the student's work assignment during the project period be compatible with accomplishing the project's goals?

- Is the problem clearly stated as a present or potential problem, not a goal?
 - Is the problem describable in terms of its current or potential consequence(s)?
 - Is the problem too ambitious or too trivial?
- Is the project manageable within two co-op terms?
 - Can the project goal be accomplished within this time frame?

The **third** step is to **identify an Employer Thesis Advisor**. A student's employer is asked to assign an advisor within the company who is in the best position to provide technical knowledge and resources in the field of the problem assignment. The Employer Advisor is the key advisor on the project and will work closely with the student on a daily or weekly basis. The Employer Thesis Advisor also is responsible for evaluating the content of the student's written thesis and provide an approval letter for the students' submission to Kettering.

The most identifiable Employer Advisor should be one who . . .

- Possesses a strong technical competence in the focus area of the project.
- Is involved with the selection and overall definition of the project.
- Understands the purpose of the project and the commitments necessary for its successful completion.
- Has some familiarity with the student's work and has established a rapport with the student based on past work experiences.
- Does not travel for extended period on a regular basis.
- Have work assignments that make them easily accessible to the student.

The **fourth** step is for the student to fill out the **Proposed Thesis Assignment (PTA)** and submit to Kettering University via KqUest. Upon the student's submission of the PTA, the Employer Thesis Advisor will receive an e-mail to view and approve the PTA. Once the Employer Thesis Advisor approves the PTA, it will then be automatically forwarded to the student's degree department for faculty review. A faculty member reviews the project and a determination is made. The proposal can be accepted, rejected or require revisions. Upon faculty acceptance, a confirmation e-mail is issued and all constituents will receive notification of the approval and the assignment of the Faculty Thesis Advisor via e-mail.

STEP-BY-STEP RESPONSIBILITIES OF THE EMPLOYER ADVISOR

Upon approval of the PTA, the Employer Thesis Advisor will . . .

- Help the student develop and approve the Plan of Attack prior to the student submitting it to the Faculty Thesis Advisor.
- Participate in the meeting with the student and the Faculty Thesis Advisor at the company or other agreed upon location. This meeting may occur during the beginning of the project or at the end of the project.
- If the thesis is to be confidential, sign Kettering's Confidential Thesis Agreement which can be found in KqUest and can be printed by the student. The agreement is submitted to CCUE prior to or no later than submission of the preliminary thesis.
- Approve the student's Thesis Abstract when prompted to do so by e-mail.
- Review the preliminary thesis for technical accuracy and recommend necessary changes. Also prepare a Preliminary Company Approval letter on company letterhead to accompany the student's Preliminary Thesis submission to Kettering University. A form letter is available in KqUest and can be printed by the student.
- Complete an Employer Thesis Advisor Evaluation which can be printed out by the student from KqUest or can be found on the CCUE website. This should be submitted with the written preliminary thesis.
- If non-confidential, sign two Final Thesis Title Pages. One bound copy of the thesis will be sent to the Employer Thesis Advisor and one bound copy will be sent to the student.
- Arrange and attend the student's presentation of the CUE project to an audience of managers and other professionals at the employer location.

ADDITIONAL RESPONSIBILITIES:

- Ensure a work schedule that will allow the student adequate time to complete the thesis project. Kettering University recommends that at least 50% of the student's time over two work terms is allotted toward their thesis project.
- Monitor the student's progress with completing the work on the thesis project and completing the writing and preliminary submission of their thesis.
- Advise the student on how to attain the project end results by suggesting sources of information and methods of approach.
- Facilitate the student's access to necessary company resources.
- Act upon requests from the student when such requests relate to the employer's policy.

FREQUENTLY ASKED QUESTIONS

- **How large should the project be?**

The project should fit within two work terms. During the first work term, students should focus on research, data collection and testing of the project. During the second work term, students should concentrate on the writing and submission of the preliminary thesis for employer review.

- **What are the due dates?**

The deadlines are based on when the student will graduate. Specific dates for each step of the process are indicated on the student's access to KqUest, a project management software tool, under the "Thesis Task List."

- **In general, how long is a thesis?**

The average thesis document is approximately 50 pages.

- **Who owns the thesis project?**

During all stages of the process, the co-op employer has total ownership of the thesis.

- **How does Kettering University ensure the quality of a thesis project?**

- The faculty reviews and approves the Proposed Thesis Assignment (PTA). If a PTA does not offer the student a quality work experience, it will not receive faculty approval.
- Our grading methodology is unique. Thesis projects that lack quality may not receive a passing grade.
- The interaction between the Faculty Thesis Advisor and the Employer Thesis Advisor. The Faculty Thesis Advisor visits the work site during the thesis project to discuss the project and to ensure that it is on track for completion.

- **What is the current grading system for the thesis project?**

Pass with Distinction (Superb Grade), Pass or Fail

- **Do all thesis projects save the employer money?**

No, not always, however, the thesis project can save the employer in other areas such as continuous improvement, utilizing new techniques, ideas or patents.

PAST THESIS PROJECT TITLES

(This list is provided to help with brainstorming possible thesis topics. Students can view past non-confidential theses through the Thesis Digital Archive available on the Kettering Library's website. To access off-campus, students should go through KUCloud.)

- DESIGN OF MODULAR SEATING FOR LIGHT RAIL APPLICATIONS
- COMPUTERIZATION OF THE WELD PROCESS/PRODUCT CONTROL AUDIT
- ANALYSIS AND IMPLEMENTATION OF SHORTER PRODUCTION LOTS AND QUICKER CHANGEOVERS ON A HIGH VOLUME MOLD LINE
- IMPLEMENTATION AND UTILIZATION OF A MULTI-COORDINATE MEASURING MACHINE
- A PRELIMINARY DESIGN PROPOSAL FOR COMPOSITE REPLACEABLE TREADS FOR TRACKED VEHICLES
- THE EFFECTS OF FURNACE PARAMETERS, PRODUCT METALLURGY AND SURFACE ON CONTINUOUS ANNEALED SHEET PRODUCT
- IDENTIFICATION OF MARKET FOR VERSAMATE INC. MODULAR INDEXING SYSTEM
- IMPROVED HANDLING AND BURNING OF SOLID WASTE
- SYNCHRONOUS MANUFACTURING OF SOFT TRIM: THE ROLE OF ENGINEERING AND PRODUCTION SUPERVISION
- DEVELOPMENT OF A CRANKCASE FASTENING STRATEGY WHICH OPTIMIZES CRITICAL ENGINE CHARACTERISTICS IN THE ASSEMBLY PROCESS
- HEAT TRANSFER ANALYSIS OF A MULTIPLE DISK CLUTCH BRAKE
- DEVELOPMENT OF AN INTERNATIONAL SOURCING STRATEGY
- COMPUTER AIDED DESIGN AND ANALYSIS OF A PLASTIC WIPER MODULE
- DEVELOPMENT OF PARAMETRIC DESIGN PROGRAMS FOR CAD/CAM GEOMETRY INTERFACE
- DEVELOPMENT OF MATH MODELS FOR THE ESTIMATION OF TOOL LIFE

STUDENT PROJECT MANAGEMENT TOOL (KQUEST)

Throughout the entire thesis process, students are instructed to use KqUest, a software project management tool. This tool is an all-inclusive software personalized for each student based on the academic and work with significant influence on the students expected graduation term, outlining their required Kettering tasks to complete, due dates to help keep the student on track, a description of how to go about completing the required tasks, and access to all required forms.

The Student Required CUE Modules and Timeline identifies the four (4) required Kettering modules students must complete during their Culminating Undergraduate Experience. Also provided within the diagram is the student's status (Junior I, Junior II, etc.) in which students should plan to execute each module. Their personalized KqUest timeline is specified by precise terms using this plan.

Kettering University Student Required CUE Modules & Timeline

Please note: Execute Project & Write Thesis over the SRI, SRII & Additional Terms Prior to Expected Graduation Term

