The University of Memphis
Department of Engineering Technology
Continuous Improvement Plan

Revision: 2011-06-21

CONTROLLED DOCUMENT

One printed copy of this document shall be kept in the
CONTINUOUS IMPROVEMENT NOTEBOOK
maintained by the Department Chair.

ALL OTHER
PRINTED VERSIONS OF THIS DOCUMENT ARE FOR REFERENCE ONLY.

The official electronic version of this file is available only at:
`https://umdrive.memphis.edu/g-engr-`
`tech/ABET/4_CONTINUOUS_IMPROVEMENT/C_I_PLAN_2011-06-21.DOC`

<u>Revision History</u>
Revision: 2009-05-29 – Original Release [R. Hewitt]
Revision: 2011-06-21 – Revised [R. Hewitt]

CONTENTS

1. Scope

This document applies to all continuous improvement processes and related documents within the Department of Engineering Technology. It includes processes that originate within the department, and which may require approval at other levels including the Herff College of Engineering and the University of Memphis.

2. Definitions

Assessment - One or more processes that identify, collect, and prepare data to evaluate the achievement of program outcomes and program educational objectives.

Evaluation - One or more processes for interpreting the data and evidence accumulated through assessment practices. Evaluation determines the extent to which program outcomes or program educational objectives are being achieved, and results in decisions and actions to improve the program.

Program educational objectives - Broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve.

Program outcomes - Narrower statements that describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge, and behaviors that students acquire in their matriculation through the program.

3. Department Mission, Vision & Core Values

It is the responsibility of all faculty members in the department to collective work toward keeping the Engineering Technology program in alignment with our stated mission, vision and core values. The official versions of these statements are contained within this document (below) and are available to the public at the following URL:
`http://www.memphis.edu/et/about/et_mission.php`.

3.1 Mission

The Department of Engineering Technology prepares qualified professionals for technical leadership positions in industry, business, government and education. The department further seeks to deliver these educational programs via traditional and non-traditional modes of instruction. The department also pursues applications oriented research and service to the individuals, businesses, industries, and the engineering profession of the Mid-South region.

3.2 Vision

The Department of Engineering Technology will be the regional leader in the Mid-South for student-centered technological education. The department will be known for its accomplishments of excellence in teaching, applied research, and service in the Mid-South. The department will become the premier Mid-South supplier of technically proficient graduates that will be actively recruited and placed in positions of leadership by industry.

3.3 Core Values

The stated values of the Department of Engineering Technology strongly support the mission of the University and College. In addition to the University and College values the Department of Engineering Technology values are:

- Teaching and learning is a shared responsibility between faculty and students.
- Enhancing student learning through innovative instructional methods.
- Providing students with the tools to become life-long learners.
- Encouraging students to become productive, participating citizens.
- Providing an atmosphere where faculty committed to learning, discovery and engagement are free to investigate, apply and transfer knowledge.
- Creating partnerships within the school and University, as well as with business and industry, to benefit student learning and technology transfer.
- Providing modern laboratories where students, faculty, and University staff, as well as business and industry personnel, can enhance their understanding of technology.
- Recognize an obligation to provide the appropriate environment to accommodate diversity of opinions, experience, opportunities and interpersonal relations.
- Pursue excellence in every activity.

The primary constituencies of the Department of Engineering Technology are the students, current and future employers of the students, and the faculty. Hence, the mission, vision, objectives, and outcomes are aimed at serving these three constituencies.

4. Program Educational Objectives

The program educational objectives (PEOs) were developed to codify a clear set of educational goals to be met by graduates of our program. The official version of these objectives are maintained within this document.

4.1 Engineering Technology Program Educational Objectives:

1. Attain gainful employment in a related technical field providing personal and professional growth

2. Pursue professional development such as additional formal education, certifications, and workshops
3. Attain increasing levels of responsibility and leadership in their chosen field
4. Apply a depth of knowledge and ability to manage, design, develop, analyze, and/or implement technical projects, demonstrating a quality of performance necessary to succeed in engineering technology careers.

5. Assessment of Program Educational Objectives

The assessment of these Program Educational Outcomes (PEOs) is

5.1 Alumni Surveys

Responsibility: Department Chair
Deadline: April 1 (Odd number years)
Implementation: Online Assessment Instrument
Documents Generated: Spreadsheet File, Printed Report
Evaluation: Spring Faculty Meeting (odd number years)

Alumni surveys are to include Likert-style (1-5) ratings of how well each student felt they had achieved each of the Program Educational Objectives. The results of this survey are to be collated into a printed report and maintained in the Alumni Survey Notebook maintained by the Department Chair.

5.2 Industrial Advisory Committee Meeting

Responsibility: Department Chair
Deadline: November 13
Implementation: On-Site Meeting
Documents Generated: Meeting Minutes
Evaluation: Spring Faculty Meeting
Standing Agenda Item: Evaluate Top-Level Reports from Web-based assessment.

The Industrial Advisory Committee (IAC) is to be composed of a representative sample of industry professionals from companies that are typical of those at which Engineering Technology graduates are employed. The meeting must meet at least once during the fall semester, and may meet during the spring semester if there are new agenda items that must be addressed. The meeting serves a dual role as a method for assessment and for evaluation of Program Educational Objectives. In the role as an assessment activity, the IAC serves as a platform for soliciting input from potential employers regarding Program Educational Objectives, and Program Outcomes. The IAC also serves a role in the evaluation of Program Outcomes, as a standing agenda item is the evaluation of the top-level assessment reports generated from the web-based assessment of Program Outcomes.

5.3 Current Student Survey

Responsibility: Department Chair
Deadline: April 1
Implementation: Online Assessment Instrument
Documents Generated: Printed Summary Report
Evaluation: Fall Faculty Meeting

The Current Student Survey polls student opinion regarding Program Educational Objectives and Program Outcomes. Similar to the alumni survey, this web-based instrument ranks student response using a Likert-style response scale.

6. Evaluation of Program Educational Objectives

6.1 Fall Department Faculty Meeting

Responsibility: Department Chair
Additional Participants: All ET Faculty
Deadline: Sept. 6
Implementation: Face-to-Face Meeting
Documents Generated: Meeting Minutes
Standing Agenda Items:

- Issue Calendar of Deadlines to Faculty
- Solicit Professional Development Plans for the academic year
- Overview of any changes to the C.I. Plan
- Evaluate Graduating Senior Exit Survey Results
- Evaluate Current Student Surveys
- Evaluate Alumni Survey (odd years only)

The fall department faculty meeting is mandatory for all ET faculty members. The agenda may include other items, but the above agenda is required. This ensures that assessment information collected from Senior Exit surveys is evaluated properly. Action items that may be generated are Curriculum Revision forms or Course Revision Request forms. Minutes from the Fall Department Faculty Meeting will be archived in the appropriate notebook maintained by the Department Chair.

6.2 Spring Department Faculty Meeting

Responsibility: Department Chair
Additional Participants: All ET Faculty
Deadline: January 27
Implementation: Face-to-Face Meeting
Documents Generated: Meeting Minutes
Standing Agenda Items:

- Overview of any changes to the Continuous Improvement Plan
- Evaluate IAC Minutes

- Evaluate Student Advisory Committee Minutes
- Evaluate Alumni Survey (even years only)

The spring department faculty meeting is mandatory for all ET faculty members. The agenda may include other items, but the above agenda is required. This ensures that assessment information collected from Alumni Survey and the Current Student Survey is evaluated properly. Since the Alumni Survey is only conducted in the fall semester of odd-numbered years, the Spring ET Facuty Meeting only evaluates this data in even-numbered years. Action items that may be generated are Curriculum Revision forms or Course Revision Request forms. Minutes from the Fall Department Faculty Meeting will be archived in the appropriate notebook maintained by the Department Chair.

6.3 Strategic Planning and Process Development Committee (SPPD)

Responsibility: Undergraduate Program Coordinator
Additional Participants: SPPD Committee Members
Deadline: Monthly Meetings
Implementation: Face-to-Face Meeting
Documents Generated: Meeting Minutes
Standing Agenda Items: Continuous Improvement Process Issues

The SPPD committee exists to ensure the processes detailed in this document are being properly implemented. As part of this function, the committee serves to make decisions on the C.I. process in general, as well as issues related to particular PEOs or POs that may have arisen from departmental meetings. This allows issues related to curriculum and planning to be resolved in an efficient and timely manner, without the need for a meeting of all departmental faculty.

7. Assessment of Program Outcomes

7.1 Graduating Senior Exit Surveys

Responsibility: Department Chair
Deadline: December 3 for Fall Graduates, April 25 for Spring Graduates
Implementation: Paper Survey, Face-to-face Meeting
Documents Generated: Survey Results
Evaluation: Fall Department Faculty Meeting

The Graduating Senior Exit Survey is designed to get both a structured collection of information from students as well as a free response of what is important to the students. The survey portion of the interview is intended to collect information such as contact information, employment, graduate school plans, and overall impressions related to the quality of the educational experience of students majoring in Engineering Technology. As part of this survey, students are asked to rank their ability on items directly related to program outcomes from 1 to 5. The results from this survey/interview are evaluated

during the Fall Department Faculty Meeting. Any issues raised at this meeting can be addressed in follow-up SPPD meetings.

7.2 Student Advisory Committee

Responsibility: Department Chair
Deadline: November 23
Implementation: On-Site Meeting
Documents Generated: Meeting Minutes
Evaluation: Spring Faculty Meeting
Standing Agenda Item: Qualitative Assessment of PEOs and POs

The Student Advisory Committee is composed of a representative sample of students who are pursuing a variety of fields of study within the Engineering Technology Program. The purpose of this meeting is to solicit feedback from students currently in the program. Students are encouraged to express what they feel is working and what is not working within the department. A standing agenda item for this meeting is a qualitative assessment of the appropriateness of the Program Educational Objectives, as well as how well student feel they are being achieved. Minutes of this meeting are evaluated in the Spring Faculty Meeting.

7.3 Web-Based Outcomes Assessment

Responsibility: All ET Faculty teaching terminal and core courses
Deadline: Grade Submission Deadline + 24 Hours (Fall & Spring)
Implementation: Web-Based Data Collection
Documents Generated: Survey Results
Evaluation: Spring & Fall Field of Study Committee Review Meetings

Each semester faculty are asked to collect and retain coursework related to specific Course Outcomes that support the Program Outcomes. The faculty member rates student work by how well it demonstrates a student's proficiency of a given Program Outcome. The work is rated on a 0-5 Likert scale with 0 being "unacceptable" and 5 being "exemplary" (the complete definitions of these levels are in Appendix C of this document). This data is aggregated by assignment and course, and an average value for how well each course outcome is supported by a given assignment is calculated.

7.4 Course Achievement Tests

Responsibility: All ET Faculty Members
Deadline: Grade Submission Deadline + 24 Hours (Fall & Spring)
Implementation: OMR Test Software (Exam View)
Documents Generated: Assignment Results Report
Evaluation: Spring & Fall Field of Study Committee Review Meetings

Each semester a standardized test will be given to each class section of every course offered by the department of Engineering Technology. The purpose of the course achievement tests is to establish a consistent measure of student performance on a

particular body of knowledge related to a particular course. Tests are administered by the instructor of record, and are closed-book and closed-note.

7.5 Senior Test - Core

Responsibility: Instructor of Record, TECH 4943
Deadline: Grade Submission Deadline + 24 Hours (Fall & Spring)
Implementation: OMR Test Software (Exam View)
Documents Generated: Learning Focus Report (by class)
Evaluation: Spring & Fall Field of Study Committee Review Meetings

Each semester a standardized test will be given to each class section of every course of TECH 4943 – Senior Project Planning Seminar. The purpose of the Senior Test - Core is to establish a consistent measure of student performance on the body of knowledge applicable to all Engineering Technology majors. Tests are administered by the instructor of record for TECH 4943, and are closed-book and closed-note. A brief review of the material is to be included in the course outline.

7.6 Senior Test - FOS

Responsibility: Instructor of Record, TECH 4945
Deadline: Grade Submission Deadline + 24 Hours (Fall & Spring)
Implementation: OMR Test Software (Exam View)
Documents Generated: Learning Focus Report (by class)
Evaluation: Spring & Fall Field of Study Committee Review Meetings

Each semester a standardized test will be given to each class section of every course of TECH 4945 – Senior Project. The purpose of the Senior Test - FOS is to establish a consistent measure of student performance on the body of knowledge applicable to all a given field of study. Tests are administered by the instructor of record for TECH 3945, and are closed-book and closed-note.

8. Evaluation of Program Outcomes

8.1 Field of Study Evaluation Meetings

Responsibility: Undergraduate Program Coordinator
Deadline for final meeting: September 29 (Fall), February 19 (Spring)
Additional Participants: Appropriate Field of Study Faculty
Documents Generated: Evaluation Form (in front of Program Outcome Books)
Standing Agenda Items: Evaluate Web-Based Assessments of Program Outcomes

These meetings take place during the first few weeks of the semester. The primary goal of these meetings is to evaluate program outcome reports and books generated by the web-based assessment process (see 7.3, above). If a particular course outcome has an

average rating of less than 2.0 it is flagged in orange, and an investigation is made into whether or not there was some assignable cause for the low value. A low-scoring assessment may result in a change in method, course outcome or assignment. However, it is expected that low-scoring are a normal part of a challenging curriculum, and a change is not mandatory. In addition to investigating low scoring assessments, several assessments are picked at random from each book for a spot-check of accuracy, and reasonableness in the rating applied. Another part of this evaluation process is to examine the number of courses and variety of faculty that support a given Program Outcome. This process typically generates Course Revision forms (Appendix D) or Request for Curriculum Revision (Appendix E). A mandatory outcome of this meeting is the completion of a Program Outcome Evaluation Form (Appendix F).

Additionally, this meeting will evaluate the results of the Senior FOS test. This will include reviewing the results of the "Learning Focus by Class" report generated by Exam View. This report will be generated based on a Proficiency Target of 60%.

8.2 SPPD Meetings (see above)

This meeting has a dual purpose, and is described in Section 6.3, above.

8.3 Department Undergraduate Curriculum Committee Meeting

Responsibility: Undergraduate Curriculum Committee Chair
Deadline for final meeting: September 29
**Additional Participants: UG Program Coordinator, Department Chair,
        Committee Members**
Documents Generated: Approved or Rejected Curriculum Change Requests
Standing Agenda Items: Evaluate Curriculum Change Requests

The purpose of this meeting is to evaluate Curriculum Change Requests that have been generated through the processes of assessing and evaluating the Program Outcomes. This meeting only processes curriculum changes that affect the Undergraduate Catalog. Change requests that are approved at this level are sent to the College Undergraduate Curriculum Committee.

Additionally, this committee will evaluate the results of the Core Senior Test. The report to be evaluated is the "Learning Focus by Class" report generated by Exam View. This report will be generated based on a Proficiency Target of 60%.

8.4 College Undergraduate Curriculum Committee Meeting

Responsibility: Associate Dean of Undergraduate Studies
Deadline for final meeting: October 9
Additional Participants: Departmental Representatives from the Herff
        College of Engineering
Documents Generated: Approved or Rejected Curriculum Change Requests.
Standing Agenda Items: Evaluate Curriculum Change Requests

The College Undergraduate Curriculum Committee Meeting is held to evaluate and approve Curriculum Change Requests that have been approved at the department level. Approved changes are submitted to the university to be incorporated into the Undergraduate Catalog. The Undergraduate Program Coordinator is responsible to verify that changes made to the catalog are accurate by the deadline given on the calendar in section 10.1.

9. Course Outcomes

Course outcomes are statements of the fundamental competencies that students should develop through the completion of a course. Course outcomes support program outcomes.

10. Continuous Improvement Program Implementation

The process of continuous improvement is implemented through a calendar of milestones that includes the activities discussed in the preceding sections of this document, as well as the following additional checkpoints. These activities are not designed to generate changes, but serve primarily to ensure that changes which were generated by the C.I. Program are properly implemented.

10.1 Curriculum Catalog Change Verification

Responsibility: Undergraduate Program Coordinator
Deadline for final meeting: August 30
Additional Participants: None
Documents Generated: None
Standing Agenda Items: Check Catalog Changes

Ensure that the published Undergraduate Catalog correctly reflects changes that were initiated through curriculum change requests. When it has been verified that outstanding curriculum revisions have been properly incorporated into the catalog, revision request forms are moved to the "Fully Implemented" tab of the Curriculum Revision Notebook (maintained by the Department Chair).

10.2 Audit Committees (Web-Based Outcomes Assessment)

Responsibility: Undergraduate Program Coordinator
Deadline for final meeting: September 13 (Fall), February 3 (Spring)
Additional Participants: Appropriate Field of Study Faculty
Documents Generated: Audit Report of Changes
Standing Agenda Items: Check data entry

This committee will be held with members of each field of study to determine the quality of the data entered by faculty during the Web-Based Outcomes Assessment activity. Extraneous or incorrect data are removed from the database before the top-level reports become finalized.

10.3 Facilities and Equipment Committee

Responsibility: Undergraduate Program Coordinator
Deadline for final meeting: October 4
Additional Participants: Chair, Faculty that have taught lab sections in the past year.
Documents Generated: Lab Plan updates and Proposed Acquisitions paperwork
Standing Agenda Items: Lab Equipment and Facilities Conditions

This committee meets to review the conditions of the laboratory equipment and facilities. A tour of the labs will be conducted, and the lab plan is reviewed. Requests for additional equipment are solicited at this meeting.

10.4 Course Revision Change Verification

Responsibility: Undergraduate Program Coordinator
Deadline for final meeting: December 8 (Fall), April 30 (Spring)
Additional Participants: Faculty that have submitted requests
Documents Generated: Log entry

This committee meets to verify that Course Change Requests have been properly implemented. These changes only affect information that is internal to the department, such as course outcomes. These are typically changes to the Web-Based Outcomes Assessment database. Curriculum Request that have been verified at this level are moved to the "Fully Implemented" tab of the Course Revision Notebook (maintained by the Department Chair), and marked as "complete" on the Revision Log.

10.5 Assessment Data Entry

Responsibility: ET Faculty teaching terminal and core corses
Deadline for final meeting: Grade Deadline + 24 Hours
Documents Generated: Student Work Reports, Assessment Reports

Faculty of terminal and core courses will be required to perform online assessment of coursework in accordance with section 7.3 of this document.

The following courses are identified as Core (upper division)

>   TECH 3044
>   TECH 3440
>   TECH 4381
>   TECH 4401
>   TECH 4462
>   TECH 4943
>   TECH 4945

The following courses are considered terminal courses for the various FOS sequences:

TECH 4234
TECH 4263
TECH 4272
TECH 4466
TECH 4474
TECH 4476
TECH 4571
TECH 4821

10.6 Continuous Improvement Calendar

The above processes are summarized chronologically in the following calendar.

Activity	Deadline	Responsibility
Curriculum Catalog Review (Check changes)	30-Aug	UG Program Coordinator
Fall Faculty Meeting (Dept)	6-Sep	Department Chair
Fall Audit Committee	13-Sep	UG Program Coordinator
Field of Study Review of Final Assessment Reports	29-Sep	UG Program Coordinator
Department Curriculum Committee Meeting	29-Sep	UG Program Coordinator
Facilities and Equipment Committee Meeting	4-Oct	UG Program Coordinator
College Curriculum Committee Meeting	9-Oct	Associate Dean of Undergraduate Studies
Current Student Surveys	1-Apr	Department Chair
Industrial Advisory Committee	13-Nov	Department Chair
Student Advisory Committee	23-Nov	Department Chair
Graduating Senior Exit Survey (Fall)	3-Dec	Department Chair
SPPD Monthly Meeting	Last day of each month	UG Program Coordinator
Course Revision Change Verification (Fall)	8-Dec	UG Program Coordinator
Assessment Data Entry	Grade Deadline +24 Hours	Instructor of Record
Spring Faculty Meeting	27-Jan	Department Chair

Spring Audit Committee Meeting	3-Feb	UG Program Coordinator
Field of Study Committee Review of Final Assessment Reports	19-Feb	UG Program Coordinator
Department Curriculum Committee	19-Feb	UG Program Coordinator
Facilities and Equipment Committee Meeting	24-Feb	UG Program Coordinator
Alumni Surveys (odd years only)	25-Apr	Department Chair
Graduating Senior Exit Survey (Spring)	25-Apr	Department Chair
SPPD Monthly Meeting	Last day of each month	UG Program Coordinator
Assessment Data Entry	Grade Deadline +24 hours	Instructor of Record

APPENDIX A - Revision Request Form

Continuous Improvement Program

Date: _____

Name: _____

Current Revision Date: _____

Proposed Revision Text:

Rationale for Revision:

Approval

Initiator : _____ Date: _____

Department Chair:_____ Date: _____

SPPD Committee Chair:_____ Date: _____

A signed copy of this request shall be maintained in the CONTINUOUS
IMPROVEMENT notebook maintained by the Department Chair.

APPENDIX B – Program Outcome Performance Levels

LEVEL 5 (EXEMPLARY) work demonstrates advanced achievement in grasping the goals of engineering technology, along with the comprehensive development of a range of specific skills and/or abilities. The work is, on the whole, clear, precise, and well-reasoned. In LEVEL 5 work, engineering terms and distinctions are used effectively. The work demonstrates a mind beginning to take charge of its own ideas, assumptions, inferences and intellectual processes. This level student often analyzes engineering problems clearly and precisely, often formulates information accurately, usually distinguishes the relevant from the irrelevant, often recognizes key questionable assumptions, and usually clarifies key concepts effectively. The student typically uses engineering language in keeping with established professional usage, frequently identifies relevant competing points of view, and shows a general tendency to reason carefully from clearly stated premises, as well as noticeable sensitivity to important implications and consequences. LEVEL 5 work displays excellent engineering reasoning and problem-solving skills. LEVEL 5 work is consistently at a high level of intellectual excellence.

LEVEL 4 (EXCELLENT) work demonstrates achievement in grasping what engineering technology is, along with the clear demonstration of a range of specific engineering skills or abilities. This level work is, on the whole, clear, precise, and well-reasoned, though with occasional lapses into weaknesses in reasoning or application. Overall, engineering terms and distinctions are used effectively. The work demonstrates a mind beginning to take charge of its own ideas, assumptions, inferences, and intellectual processes. The student often analyzes engineering problems clearly and precisely, often formulates information accurately, usually distinguishes the relevant from the irrelevant, and often recognizes key questionable assumptions, usually clarifies key concepts effectively. The student typically uses engineering language in keeping with established professional usage, and shows a general tendency to reason carefully from clearly stated premises, as well as noticeable sensitivity to important implications and consequences. LEVEL 4 work displays good engineering reasoning and problem solving skills.

LEVEL 3 (GOOD) work illustrates demonstrable, but inconsistent achievement in grasping what engineering technology is, along with the development of modest engineering skills or abilities. LEVEL 3 work shows some emerging engineering skills, but also pronounced weakness as well. Though some of the work is reasonably well done, other parts are poorly done; or are mediocre. There are more than occasional lapses in reasoning or application. Though engineering terms and distinctions are sometimes used effectively, sometimes they are used ineffectively. On occasion LEVEL 3 work displays a mind taking charge of its own ideas, assumptions, inferences, and intellectual processes. Only occasionally does LEVEL 3 work display intellectual discipline and clarity. The LEVEL 3 student inconsistently analyzes problems clearly and precisely, formulates information accurately, distinguishes the relevant from the irrelevant, recognizes key questionable assumptions, clarifies key concepts effectively, uses vocabulary in keeping with established professional usage, and reasons carefully from clearly stated premises, or recognizes important engineering implications and consequences. Sometimes the

LEVEL 3 student seems to be simply going through the motions of the assignment, carrying out the form without getting into the spirit of it. ON the whole, LEVEL 3 work shows modest and inconsistent engineering reasoning and problem-solving skills.

LEVEL 2 (FAIR) work shows only a minimal level understanding of what engineering is along with the development of some, but very little, engineering skills or abilities. LEVEL 2 work shows fair engineering reasoning, but lapses into uncritical thinking. Assignments may be somewhat poorly done. There is some evidence that the student is "reasoning" through the assignment. Often the student may seem to be going through the motions of the assignment, carrying out the form without getting into the spirit of it. LEVEL 2 work rarely shows any effort to take charge of ideas, assumptions, inferences, and intellectual processes. In general, LEVEL 2 performance lacks discipline and clarity. In LEVEL 2 work, the student rarely analyzes engineering problems clearly and precisely enough, almost seldom formulates information accurately, rarely distinguishes the relevant from the irrelevant, rarely recognizes key assumptions, seldom describes key concepts effectively, fails to use engineering vocabulary in keeping with established professional usage, and seldom reasons carefully from clearly stated premises, or recognizes important implications and consequences. LEVEL 2 work frequently displays barely adequate engineering reasoning and problem solving skills.

LEVEL 1 (POOR) work fails to display an acceptable understanding of the basic nature of engineering reasoning, and only displays the weakest of engineering skills and abilities. The work is often vague, imprecise, or unreasoned. There is some, but very little evidence that the student is genuinely engaged in the task of taking charge of his or her engineering reasoning. Many elements may appear to have been done pro forma, the student simply going through the motions without really putting any significant effort into thinking his or her way through them. Consequently, the student is not analyzing engineering problems clearly enough, not formulating information accurately enough, often not distinguishing relevant from irrelevant information, often not identifying key questionable assumptions, not clarifying key concepts, not reasoning carefully from clearly stated premises, or tracing implications and consequences. The student's work does not display discernable engineering reasoning and problem solving skills.

LEVEL 0 (UNACCEPTABLE) work fails to display an understanding of the basic nature of engineering reasoning, and does not display the engineering skills and abilities, which are at the heart of the assignment. The work is vague, imprecise, and unreasoned. There is little or no evidence that the student is genuinely engaged in the task of taking charge of his or her engineering reasoning. Many elements appear to have been done pro forma, the student simply going through the motions without really putting any significant effort into thinking his or her way through them. Consequently, the student is not analyzing engineering problems clearly, not formulating information accurately, not distinguishing relevant from irrelevant information, not identifying key questionable assumptions, not clarifying key concepts, not reasoning from clearly stated premises, or tracing implications and consequences. The student's work does not display any engineering reasoning or problem solving skills.

Adapted from *The Thinker's Guide to Engineering Reasoning*, by Richard Paul, Robert Niewoehner, and Linda Elder. 2006 The Foundation for Critical Thinking.

APPENDIX C – Curriculum Change Request

(Maintained by the Unviersity provided here as reference only)

The University of Memphis
Request for Course Revision

For information concerning and/or completing this form, go to the Course Revision Directions page. Address questions or comments to: Dr. Catherine Serex for undergraduate, or Dr. Karen Weddle-West for graduate revisions.

I. DEPARTMENT

II. TYPE OF CHANGE *(Check all that apply)*

☐	Close Out Course	☐	Credit Hours	☐	Lab Hours	☐	Add/Delete Prerequisite
☐	Title	☐	Description	☐	Repeatability	☐	Add/Delete Corequisite
☐	Subject Area	☐	Cross-Listing	☐	Grading	☐	Instructional Method/Schedule Type
☐	Course Number	☐	Course Fee	☐	Add 6000, 7000 or 8000 level course	

III. BULLETIN DESCRIPTION

Subject Area		Course Number	Credit Hours
Schedule Type			
Previous Number *(if changing)*	Previous Hours *(if changing)*		
Instructional Method		Grading:	○ A-F ○ S/U,I ○ S/U,IP ○ A-F, IP
Course Title			
Previous Title *(if changing)*			
New Course Description or reason for change.			

IV. OVERLAP

This course has been discussed with other departments to ensure against overlap.
No ☐ Yes ☐ Person contacted in the other department

V. Please submit your name and e-mail address as a contact source for this form.
Name _____ E-Mail _____

[Reset]

THE UNIVERSITY OF MEMPHIS.

Engineering Technology Department

Course Revision Request Form

Instructions: This form must be completed and submitted to the chair to initiate any change to an existing course, proposal of a new course, or proposal to discontinue a course. It may be completed by any member of the faculty and submitted to the chair at any time. Submissions made in the summer will not be considered until the fall semester. Submission of this form must include documentation justifying the request.

Course Title & Number:_____   Work Order Number: _____

Date Assigned: _____

Person making the request:_____   Date of Request:_____

3-year History of Course Offering

Semester	Instructor	Semester	Instructor	Semester	Instructor

The request must be supported with a justification that includes documentation from:
_____ Survey of current students (attach survey and results or analysis of graded student work)
_____ Survey or correspondence with alumni (attach survey/results or correspondence)
_____ Meeting of faculty (full and/or part time) (attach meeting minutes)
_____ Report from ABET evaluators. (site the date of the visit)
_____ Industrial Advisory Committee meeting minutes
****

These revisions are for internal consideration only. The Strategic Planning and Process Improvement Committee will consider this request. You will be notified through the Chair's office of their decision. If approved, this change can be implemented immediately.
Revision Requested:
_____ Add new course outcome.
         Include the new course outcome here.
_____ Remove a current course outcome.
         Include the current course outcome here.
_____ Modify a current course outcome.
         Include the modified course outcome here.
_____ Change the program outcomes supported by this course. (From ___ to ___)
****

****

These revisions require approval at the Department level, College level and University level. The Undergraduate Curriculum Committee will consider this request. You will be notified through the Chair's office of their decision. If approved, the appropriate paperwork will be completed and forwarded to the College Undergraduate Curriculum Committee. If approved at the College and University levels, the change will be implemented for the next academic year.
Revision Requested:
_____ Modify course description
         Include the modified course description here.

_____ Modify course title
Include the modified course title here.
_____ Change number of credit hours. (From ___ to ___)
_____ Change course from required to elective.
_____ Change in course number. (From ___ to ___)
_____ Change in course prefix. (From ___ to ___)
_____ Change Pre/Co Requisite
_____ Propose Special Topics Course
_____ Propose New Course
_____ Discontinue course.
****
****

Submit this form and associated documentation to the Chair.

APPROVED:_____   Date:_____
NOT APPROVED:_____   Date:_____
Comments:

APPENDIX D – Outcomes Assessment System Flowchart

1   End of controlled document