ABET Preparation Handout #2

Data Collection Guide

This guide is provided to the DUS to instruct faculty on the course syllabi, student work, faculty course-notes and faculty CVs that need to be collected during the 2019/2020 academic year for ABET's 2020 Comprehensive Review.

Introduction

ABET requires a comprehensive Self Study and "Supporting Information" to evaluate during their review process[1]. This Data Collection Guide identifies the "Supporting Information" that must be collected for the 2020 ABET on-site review. This information MUST be shared with ALL faculty members who teach engineering and technical-support courses (such as math, chemistry and physics) during the 2019-2020 Academic Year.

"Supporting Information"

The following "Supporting Information" must be collected for each technical course (including math/science) in the curriculum (regardless of the frequency the course is offered):

- *Course syllabi (format specified by ABET – that format and an example are enclosed with this guide) for each course (including support courses) in the accredited program*
- *Three examples of student work from each course (handouts, homework, exams, reports and any other artifacts associated with the course)[2] [3]*
- *A copy of the course textbook*

Additional information that needs to be collected for the Self Study

- *CVs from each Departmental faculty are required as an appendix in the Self Study. The format of the CV is prescribed and a template of that format is enclosed with this guide. A copy of a CV from a previous Self Study is also enclosed as a reference. It is*

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[1] The need for student work is detailed in section II.G.6 of ABET's "Accreditation Policy and Procedure Manual."

[2] Student work is not required for the math/science courses that are taught outside of SEAS.

[3] It is suggested that each instructor adopt one of the following procedures at the beginning of the semester:

1. Each syllabus contain the following words to ensure that each student maintains a course notebook that can be collected at the end of the term: "COURSE NOTEBOOK: As part of the requirements for the course, each student must maintain a course notebook. The notebook must contain all notes taken in class, handouts and all graded materials including homework assignments, reports and exams. Submission of a complete course notebook at the end of the course is a course requirement & a component of your course grade. Your notebook will be returned to you during the following semester except for selected notebooks which will be retained for submission to the Accreditation Board for Engineering and Technology (ABET) reviewers when they visit campus in the Fall 2020 to review the Chemical, Electrical and Mechanical Engineering programs. The retained notebooks will be returned after the ABET visit."
2. The TFs make a copy of three examples of each piece of graded student work (top score, middle score, low score). This includes all HW, exams and project documentation. This needs to be done before each graded assignment is returned to the students.

recommended that the DUS use a Department Administrative Assistant to solicit (and help prepare) these CVs from each member of the faculty.

- *Courses that contribute to Program Outcomes need to maintain a grading spreadsheet (using a provided template) to measure the course's contributions to those outcomes. Details on this spreadsheet are the subject of a separate ABET Preparation Handout.*

Why are course materials needed for the accreditation visit?

The ABET visiting team will have the Self Study in advance of their campus visit. Having read the Self Study, they will use the visit to examine areas of interest that surfaced from their read of the Self Study and to verify components within each program. The best way to do this is to have ALL work from three students (that represent different levels of performance exemplary, satisfactory, unsatisfactory) available to the reviewers. As such, it is advised that all students maintain a course notebook over the term. At the end of the term, the instructor should select three samples of these course notebooks that can be submitted to the DUS and retained for the on-site review in the Fall 2020.

The course materials aid in the on-site review and serve to:

- *Demonstrate topic coverage as well as the breadth and depth of material in each course*
- *Illustrate the type and level of work required in each course*
- *Provide examples that demonstrate achievement of student outcomes (ABET Criteria 2 – Student Outcomes)*
- *Support classification as math/science, engineering topics in the Self Study curriculum table (ABET Criteria 5 – Curriculum)*
- *Indicate grading standards*

Enclosures:

1. *ABET prescribed format (in Self Study) for course syllabi*
2. *Example course syllabi from a previous ABET Self Study*
3. *ABET prescribed format (in Self Study) for CVs*
4. *Example CV from a previous ABET Self Study*

ABET Prescribed Format for Self Study APPENDIX A – Course Syllabi

Please use the following format for the course syllabi (2 pages maximum in Times New Roman 12 point font)

1. Course number and name

2. Credits and contact hours

3. Instructor's or course coordinator's name

4. Text book, title, author, and year
    a. other supplemental materials

5. Specific course information
    a. brief description of the content of the course (catalog description)
    b. prerequisites or co-requisites
    c. indicate whether a required, elective, or selected elective course in the program (required courses are required of all students in the program, elective courses are optional for students, and selected elective courses are those for which students must take one or more courses from a specified group).

6. Specific goals for the course
    a. specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.
    b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

7. Brief list of topics to be covered

Example from 2014 Yale Self Study: APPENDIX A - Course Syllabus

1. Course number and name: MENG 390 Mechatronics Laboratory

2. Credits and Contact Hours: 1 Credit, Lectures on Tuesday and Thursday, 7:30-8:30pm, Mason ML104, Labs on Friday, 12:00pm-3:00pm,

3. Instructor's Name: Brendan J. Englot

4. Textbook: (a) *Introduction to Mechatronics and Measurement Systems*, Fourth Edition, by David G. Alciatore and Michael B. Histand, 2012. (b) *Control Systems Engineering*, Sixth Edition, by Norman S. Nise, 2011.

5. Specific course Information:

   a. Catalog Description: Hands-on synthesis of control systems, electrical engineering, and mechanical engineering. Review of Laplace transforms, transfer functions, software tools for solving ODEs. Review of electronic components and introduction to electronic instrumentation. Introduction to sensors; mechanical power transmission elements; programming microcontrollers; PID control.

   b. Prerequisites: ENAS 194, ENAS 130, and EENG 200.

   c. Prerequisite, required, or elective course: Required.

6. Specific Goals for the Course:

   a. Specific outcomes of instruction: Students will have a sound understanding of the principles governing electric circuits, sensors (strain gauges, potentiometers, accelerometers, rotary encoders), actuators (DC motors), and their use in computer-controlled devices; Students will be able to mathematically analyze, design, and synthesize computer-controlled engineering systems with mechanical and electrical components; Students will be able to apply lumped-parameter modeling to design and implement single-input, single-output, linear feedback control systems to meet design specifications on stability, settling time, overshoot, steady-state error and other common engineering performance criteria.

   b. Which student outcomes listed in Criterion 3 are addressed by this course: Criterion 3: (a) apply knowledge of mathematics, science, and engineering, (b) design and conduct experiments, as well as to analyze and interpret data, (c) design a system, component, or process to meet desired goals, (e) identify, formulate, and solve engineering problems, (k) use the techniques, skills, and modern engineering tools necessary for engineering practice.

7. Brief list of topics to be covered: Linear Circuits, Semiconductors, Op-Amps, Sensors, Actuators, System Modeling, Microcontrollers, Computer Programming, Data Acquisition, Feedback Control.

ABET Prescribed Format for Self Study APPENDIX B – Faculty Vitae

Please use the following format for the faculty vitae (2 pages maximum in Times New Roman 12 point type)

1. Name
2. Education – degree, discipline, institution, year
3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time
4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time
5. Certifications or professional registrations
6. Current membership in professional organizations
7. Honors and awards
8. Service activities (within and outside of the institution)
9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation
10. Briefly list the most recent professional development activities

Example from 2014 Yale Self Study: APPENDIX B - Faculty Vitae

Yale University *School of Engineering & Applied Science* Spring 2014

1. Name and Academic Rank: Gary Haller
Professor

2. Degrees with disciplines, institutions, and dates:
Ph.D. Physical Chemistry, Northwestern University, 1966
B. S. Mathematics, University of Nebraska, 1962

3. Academic experience with institution rank and title:
- Professor of Chemical & Environmental Eng. and Chemistry*, 1981-present
- Visiting Professor, Technical University of Münich, 2011-present
- Visiting Scholar, New York University, 2010
- Chair, Department of Chemical Engineering*, 1996-1999
- Chair, Council of Engineering*, 1990-1994
- Professor, Department of Chemical Engineering and Chemistry*, 1985-present
- Henry Prentiss Becton Professor of Engineering and Applied Science*, 1984-present
- Chair, Council of Engineering*, 1984-1987
- Acting Chair, Department of Chemical Engineering*, 1983
- Professor of Engineering and Applied Science*, 1980-1981
- Science Research Council, Senior Visiting Fellow, University of Edinburgh, 1978
- Associate Professor of Engineering and Applied Science*, 1972-1980
- Université Catholique de Louvain, Belgium (1971-1972)
- Assistant Professor of Engineering and Applied Science*, 1967-1972 [*Yale University]
- NATO Postdoctoral Fellow, Oxford University, 1966-1967

4. Non-academic experience:
- Director, Henry Koerner Center for Emeritus Faculty, Yale Univerisity, 2013-present
- Master, Jonathan Edwards College, Yale University, 1997-2008
- Acting Master, Jonathan Edwards College, Yale University, 1981

5. Certifications or professional registrations: N/A

6. Current membership in professional organizations: member, Connecticut Academy of Science and Engineering

7. Honors and awards:
- Professeur Invité à l'Université Pierre et Marie Curie (Paris VI), 1996
- NIOK (Netherlands Institute for Catalysis Research) Lecturer (Guest Teacher), 1996
- Lacey Lecturer in Chemical Engineering; California Institute of Technology, 1996
- Ipatieff Lectureship; Northwestern University, 1996
- Harry Fair Lectureship; University of Oklahoma, 1995
- Robert Burwell Lectureship; The Catalysis Society, sponsored by Amoco, 1995
- Yale Science and Engineering Association Meritorious Service Award, 1995

9. Most important publications and/or presentations (within 5 years):
- Schuessler, Forian; Schallmoser, Stefan; Shi, Hui; Haller, Gary L.; Ember, Erika; Lercher, Johannes A.; ACS Catalysis (2014) DOI: 10.1021/cs500200k.

- Sun, Xianyong; Mueller, Sebastian; Shi, Hui; Haller, Gary L; Sanchez-Sanchez, Maricruz; van Veen, Andre C.; Lercher, Johannes A.; On the impact of co-feeding aromatics and olefins for the methanol-to-olefins reaction on HZSM-5, J. Catal. (2014) 314, 21-31.
- Liu, Changchang; Pfefferle, Lisa D.; Haller, Gary L.; The Electronic Structure or Charge Delocalization of Sulfated Zirconia (Supported on Multi-walled Carbon Nanotubes): Acid Sites Probed by X-ray Absorption Spectroscopy, Topics in Catal. (2014) 57, 774-784.
- Ren, Fang; Kanaan, Stacy A.; Majewska, Magdalena M.; Keskar, Gayatri D.; Azoz, Seyla; Wang, Xiaoming; Haller, Gary L.; Chen, Yuan; Pfefferle, Lisa D.; Increase in the yield of (and selective synthesis of large-diameter) single-walled carbon nanotubes through water-assisted ethanol pyrolysis, J. Catal. (2014) 309, 419-427.
- Liu, Changchang; Bolin, Trudy; Northup, Paul; Lee, Sungchul; McEnally, Charles; Kelleher, Patrick; Pfefferle, Lisa; Haller, Gary L.; Combined Zr and S XANES Analysis on S-ZrO2/MWCNT Solid Acid Catalyst, Topics in Catal. (2014) 57, 693-705.
- Ren, Fang; Kanaan, Stacy, A.; Khalkhal, Fatemeh; Loebick, Codruta Zoican; Haaller, Gary L.; Pfefferle, Lisa D.; Controlled cutting of single-walled carbon nanotubes and low temperature annealing, Carbon (2013) 63, 61-70.
- Azoz, Seyla; Jiang, Jie; Keskar, Gayatri; McEnally, Charles; Alkas, Alp; Ren, Fang; Marinkovic, Nebojsa; Haller, Gary L.; Ismail-Beigi, Sohrab; Pfefferle, Lisa D.; Mechanism for stron binding of CdSe quantum dots to multiwall carbon nanotubes for solar energy harvesting, Nanoscale (2013) 5(15), 6893-6900.
- Gutieerez, O. Y.; Yu, Y.; Kolvenback, R.; Haller, G. L.; Lercher, J. A.; Hydrogenation of tetralin over Pt catalysts supported on sulfated zirconia and amorphous silica alumina, Catal. Sci. Technol (2013) 3(9), 2365-2372.
- Ren, F.; Kanaan, S.A.; Khalkhal, F.; Loebick, C. Z.; Haller, G. L.; Pfefferle, L. D.; Controlled cutting of single-walled carbon nanotubes and low temperature annealing, Carbon (2013) 63, 61-70.
- Lee, Sungchul; Keskar, Gayatri; Liu, Changchang; Schwartz, William R.; McEnally, Charles S.; Kim, Ju-Yong; Pfefferle, Lisa D.; Haller, Gary L. Deactivation characteristics of Ni/CeO_2-Al_2O_3 catalyst for cyclic regeneration in a portable steam reformer, Applied Catalysis, B: Environmental (2012), 111-112, 157-164.
- Yu, Yanzhe; Fonfé, Benjamin; Jentys, Andreas; Haller, Gary L.; van Veen, J.A. R.; Gutiérrez, Oliver Y.; Lercher, Johannes A. Bimetallic Pt-Pd/silica-alumina hydroteating catalysts. Part I: physicochemical characterization. J. Catal. (2012)292, 1-12.
- Yu, Yanzhe; Fonfé, Benjamin; Jentys, Andreas; Haller, Gary L.; van Veen, J.A. R.; Gutiérrez, Oliver Y.; Lercher, Johannes A. Bimetallic Pt-Pd/silica-alumina hydroteating catalysts. Part II: Structure-activity correlations in the hydrogenation of tetralin in the presence of dibenzothlophene and quinoline. J. Catal. (2012) 292, 13-25.
- Wang, Xiaoming; Li,Nan; Zhang, Zhiteng; Wang, Chuan, Pfefferle, Lisa D.; Haller, Gary L. High yield hydrogen production from aqueous phase reforming over single-walled carbon nanotube supported catalysts, ACS Catal., (2012) 2, 1480-1486.
- Shi, Hui; Li, Xuebing; Haller, Gary L.; Gutierrez, Oliver Y.; Lercher, Johannes A. Active sites and reactive intermediates in the hydrogenolytic cleavage of C-C bonds in cyclohexane over supported iridium, J. Catal. (2012) 295 133-145.

10. Professional development activities:

- Visiting Scholar, National Bureau of Standards (1981)