

Faculty Development Plan: Proposal

Name

July 5, 2016

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1 Teaching

1.1 Self-Assessment

To date my teaching efforts have been very satisfying. I taught recitations for two graduate level courses at MIT, and since coming to BYU I have taught two undergraduate level courses (ME EN 250 and ME EN 382). Based on student feedback, I believe that my pedagogical strengths include the ability to explain concepts clearly and to provide helpful examples (both demonstrative and practical).

My highest priority for improving my pedagogy relates to the course I most recently taught, ME EN 382, and which I will teach again during Winter 2017. This course covers an extremely large amount of material which presents a pedagogical challenge. I inherited the materials for this course from another instructor and attempted to adapt them to my own teaching style and build upon the existing material. Some of these changes had positive results and others still need work. Below I outline my professional pedagogical goals and a specific proposal for improving this course.

1.2 Professional Goals and Project Proposal

1.2.1 Goals

My near term teaching goal is to engineer a better structured and more active learning environment for ME EN 382 that supports departmental objectives and expands the spectrum of manufacturing process for which the students get hands-on experience. In the longer term, I intend to develop a graduate level course on materials kinetics.

1.2.2 Project Proposal

Objective

The objective of this course development proposal is to improve my ME EN 382 course in 3 specific ways: (1) support the department's writing thread, (2) improve the course project, (3) improve and standardize the curriculum. To accomplish this, I am requesting funding to support 1-2 TAs during the 2016 Spring/Summer terms.

Impact

Support the Department's Writing Thread

In support of the department's writing thread, and per the consensus of the ME EN 382 course committee, I plan to make the following changes to the course, with the assistance of the proposed TAs: (i) Include an executive summary report as a new component of the Pipsqueak Engine project report (ii) Produce improved rubrics and examples for the Pipsqueak Engine technical report and presentation

Improve the Course Project

In addition to changes related to the writing thread, I plan to improve the Pipsqueak Engine project by expanding the number of manufacturing operations that students use to produce their engines. Historically, the pipsqueak engines have been manufactured exclusively by machining operations. This past semester, I introduced the use of 3D printing and sand casting to produce the flywheels for the engine. The student response to this change was very positive, and I believe that including additional manufacturing operations would further benefit the students by giving them hands on experience with the manufacturing operations discussed in class and would enrich their learning experience. To accomplish this will require investigation of existing capabilities and their appropriateness for this project. It will also involve planning and prototyping the use of the new processes for the project, and generating instructions for students and future TAs.

Standardize & Improve Lectures and the Curriculum

During Winter Semester 2016 as I taught ME EN 382 for the first time, I converged on a standardized structure for the curriculum that clearly outlined for the students which concepts and material would be covered and provided a simple and consistent framework for the course:

- Process Overview
- Process Parameters
- Microstructure/Properties
- Defects
- Design Guidelines

I propose to review each of the chapters/lectures and revise the content/presentation to fit this standard structure.

I also propose to improve the lecture format and content by developing in-class demos for each of the manufacturing processes that we cover and identifying supporting media for each of the processes. The assistance of the proposed TAs in demo development will be particularly valuable and will provide these students with an open ended, but reduced scope, design experience as well as more in-depth experience with these manufacturing processes.

I plan to hold weekly progress review/planning meetings with the TAs during which they will report their progress, we will discuss challenges and prioritize and make plans for the upcoming week.

1.2.3 Required Resources

The primary expense associated with the proposed project is the wages of the TAs. I estimate that the projects outlined above will require around 360 labor hours (20 hrs/week * 18 weeks). Assuming that the TAs will be hired from the pool of students and TAs that took my class, the estimated hourly wage would be \$10/hr. The total cost for wages is estimated to be \$3600. The proposed budget, including wages and other expenses is summarized below.

Purpose	Amount
TA Wages	\$3,600
Materials	\$200
TOTAL:	\$3,800

Additionally, the Faculty Center offers \$300 grants for materials to be used in support of the faculty development plan, which I will apply for to help defray the cost of the in-class demo development and Pipsqueak Engine project development. I also plan to request help from the department secretaries in an effort to leverage existing resources without increasing cost, for portions of the proposed project that would be appropriate.

1.2.4 Progress to Date

I submitted my teaching proposal to the Mechanical Engineering Department and received approval and funding to pursue my proposed project. I have hired two undergraduate students as TAs to assist with this course development project, one of whom was a student I taught in this class last semester and the other was one of my TAs for this class last semester. I believe that the two perspectives will be valuable as I work to realize the proposed changes.

2 Scholarship

2.1 Self-Assessment

Based on feedback from mentors and colleagues I feel that my scholarship strengths include the ability to communicate my research ideas and results in articulate and compelling ways both in writing (*e.g.* papers and proposals) and *via* oral presentations.

The overarching theme that will serve as a framework for my program of scholarship is the study of complex networks in materials. This includes investigating the influence of microstructural anisotropy, heterogeneity and topology on the properties of hard materials. I use a combination of theory, computation, and experiments to exploit these attributes of microstructures in an effort to design and synthesize materials with enhanced and/or tailored performance and to gain new insights into the relationships between the structure of materials and their properties.

The principal areas of scholarship development that I feel the need to work on are highlighted below in my professional scholarship goals.

2.2 Professional Goals and Project Proposal

2.2.1 Goals

My goals for scholarship development are (1) expand the visibility and impact of my research, (2) obtain external funding, and (3) improve my mentoring of students.

2.2.2 Project Proposal

Rather than a single monolithic scholarship project, my proposal for scholarship development consists of several specific strategies for scholarly productivity related to my respective scholarship goals (outlined below). To measure my success in implementing these strategies, I will report on them both as part of my annual stewardship report (Faculty Profile) and in the FDP final report.

Research Visibility & Impact

- I plan to meet personally with project managers for the funding organizations that I intend to apply to. These meetings will take place either through a formal trip to Washington, DC or at conferences that I attend.
- I plan to submit at least 3 journal papers for publication per year.
- I plan to present my research at the annual meetings of The Minerals, Metals, and Materials Society (TMS) and the Materials Research Society (MRS).
- I will also encourage the majority of my student research assistants to present at some conference annually.

Funding

- I will submit 3 funding proposals per year. This year one of these will be an internal proposal for a Mentoring Environment Grant (MEG).
- I will submit an NSF CAREER proposal this year, and continue to submit to early career programs (*e.g.* the AFOSR Young Investigator Program, and the DOE Early Career Program) until I obtain an award or I am no longer eligible.

Student Mentoring

- I will help each of my research assistants (who have not already received one) to submit an ORCA proposal until they are awarded one or they are no longer eligible.
- Related to the previous action item, I plan to explore the use of the BYU Writing Center as an additional resource to help my students develop their writing abilities as they apply for ORCA grants, submit conference abstracts, and write archival journal papers.
- I was impressed by the leadership approach described by Liz Wiseman during her 2015 BYU Devotional. I plan to read her book *Multipliers* and implement the ideas suggested therein.

2.2.3 Relationship to Department Goals and Needs

The *Big Inspired Goal* (BIG) of the BYU Department of Mechanical Engineering is to “Be recognized as the best undergraduate mechanical engineering program in the world and the alma mater for the world’s most influential engineers.” To be recognized as the top engineering program and to produce influential engineers will require that as a faculty we expand the visibility of the department as described in the department’s *Envisioned Future*:

“Our faculty will be recognized nationally and internationally as experts in their fields.” My goals for expanding the visibility and impact of my research and improving my mentoring of students directly support this department aim. My goal to obtain funding is also in line with the envisioned future of the department: “We will have external partners that readily provide resources and other support necessary to fulfill our core purpose.”

2.2.4 Required Resources

The most significant resource that I will need to achieve these goals is funding to travel to conferences and Washington, DC. I plan to use the travel funds supplied by the department for this purpose.

2.2.5 Progress to Date

Last year I submitted two proposals (one NSF proposal, which has been recommended for funding, and one MEG proposal, which was rejected). I have not submitted any proposals yet this year, but I am currently preparing a proposal for the NSF CAREER program. I submitted one paper this year, which has been accepted for publication. I have two other papers already in preparation. I and three of my students submitted abstracts for the annual international TMS conference, which happens to be held in Salt Lake City this year, and all of the abstracts were accepted. Three of my students applied for ORCA proposals last fall and one of them received an ORCA grant.

3 Citizenship

3.1 Self-Assessment

From the citizenship activities listed on my faculty stewardship report, I believe that I am contributing in many meaningful ways¹ and, for a new faculty member, I am perhaps giving too much time to citizenship activities.

3.2 Professional Goals and Project Proposal

3.2.1 Goals

As a new faculty member I recognize the need to make sure that the scope of my citizenship activities is appropriate. My overarching goal—and something that I feel inspired to work on—is to expand opportunities for students on campus. Below I present a proposal for several specific ways that I believe I can make significant contributions to that end.

¹A brief summary is provided here: serving on 2 Course Committees, 3 Graduate Committees, reviewer for journals, reviewer for ORCA proposals, judge for Nephi’s Steel Bow competition, assisting to obtain Metal Additive Manufacturing capability at BYU, writing numerous letters of recommendation, nominated student for student employee of the year award, participating in the committee to revise the department PhD program, participating in the development of a Materials Science & Engineering group across campus.

3.2.2 Project Proposal

To make sure that my citizenship activities are of appropriate scope, rather than *leading* a single citizenship project, I propose to be a *contributing member* to several efforts as outlined below:

PhD Qualification Exams

An initiative is currently being spearheaded by Dr. Anton Bowden to evaluate and improve the PhD program in the Mechanical Engineering Department. I will support this effort by contributing to the PhD Qualification Exam subcommittee. In this capacity I will work with other faculty committee members to research the PhD qualification procedures used by peer institutions, evaluate the goals and needs of our department, and propose appropriate modifications to our qualification procedure.

MSE@BYU

Dr. Eric Homer of the Department of Mechanical Engineering has begun to organize a materials science & engineering (MSE) group at BYU. The goal of this effort is to provide resources to better serve the students and faculty studying materials science at BYU. This will include compiling a list of MSE courses taught across campus, and perhaps defining a core set of courses that is regularly taught and which, upon completion, will allow students to get some form of certification of their MSE emphasis. Other components of the group that have been discussed include invitation of prestigious MSE speakers, facilitating interdepartmental cross-pollination and collaboration, a unified effort to obtain major grants, and a web site to highlight MSE research on campus and provide direction to students interested in studying MSE. I will contribute to this effort as a participating member and fulfill assignments as appropriate.

3.2.3 Relationship to Department Goals and Needs

The department of Mechanical Engineering has set a goal to double its PhD student enrollment from an original 25 students to 50 students. This fall we will have approximately 47 students. With this growth in the graduate program significant areas for improvement have been identified and it has been recognized that certain changes are necessary to support this growing graduate student population. As such, my participation in the effort to revise the PhD qualification assessment directly supports these goals and needs of the department.

Finally, there are numerous students in the ME department that are currently engaged in MSE research. However, their pursuit of education in this area has been largely ad hoc in the absence of any organized MSE group. The establishment of the MSE@BYU group will help to expand learning opportunities for ME students (both undergraduate and graduate) who are interested in MSE.

3.2.4 Required Resources

Time is the only resources required for my participation in these citizenship efforts. Additional financial resources necessary to the success of these large efforts will be sought from

relevant organizations as necessary.

3.2.5 Progress to Date

The ME PhD work group has held an initial meeting, which I attended. We discussed concerns and approaches to evaluate and improve the qualification exam. We received assignments to subcommittees and will reconvene with the results of our research efforts in one month. Subsequent to this frequent committee meetings will be held and we will work towards providing a preliminary proposal to the department during the faculty retreat at the end of the summer. I have led the effort to collect and analyze data on qualification procedures used by peer institutions and I have convened the Quals subcommittee for two initial meetings to discuss these findings and brainstorm ideas for improvement.

An initial MSE@BYU meeting was held with about 15 representatives from at least 4-5 departments across campus. We discussed goals and determined to select department representatives as a steering committee for the effort.

ME EN 382 - Manufacturing Processes

Instructor: Name

Course Information

Description

Common manufacturing processes, including technological limitations and economic considerations. Influence of product design on process selection and manufacturing efficiency.

Learning Outcomes

Impact on Society

1. Demonstrate an understanding of the impact of manufacturing capability on society.

Manufacturing Processes

2. Recognize and develop a familiarity with a variety of manufacturing processes and how they are classified. Demonstrate understanding of the physical phenomena involved in how various families of manufacturing processes work.

Selection of Manufacturing Processes

3. Identify characteristics and capabilities of various manufacturing processes so that recommendations for process selection plans can be made. Recommend process parameters for various manufacturing processes. Identify materials and/or their properties that would be appropriate for successful use with various manufacturing processes.

Cause and Effect Relationships

4. Identify cause and effect relationships for various manufacturing process parameters so that inferences from process data can be made to obtain desired process results.

Practical Design

5. Make practical design recommendations to improve the manufacturability of component parts based on manufacturing process knowledge.

Capability and Development of Processes

6. Perform various manufacturing processes with real process equipment in order to begin to develop good engineering judgment about the capability of various processes, and the development of process plans.

Team Projects

7. Work successfully in teams to modify the design, build, and test a practical product designed in Me En 272.

Writing & Presentation of Engineering Reports

8. Write and present professional quality engineering reports on manufacturing processes and projects. Communicate professional quality responses to open-ended manufacturing process questions.

Prerequisites

Me En 250

Materials

Item	Price (new)	Price (used)
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	MANUFACTURING ENGINEERING & TECHNOLOGY 7E <i>Required</i> by KALPAKJIAN, S	233.20
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Grading Scale

Grades	Percent
A	93%
A-	90%
B+	87%
B	83%

B-	80%
C+	77%
C	73%
C-	70%
D+	67%
D	63%
D-	60%
E	0%

Grading Policy

Class Curve:

This class is generally curved when final grades are submitted, to meet College and departmental expectations for course average GPA's. The grading scale may be curved up or down, depending on student performance. Learning Suite will post "normal" grading guidelines but we are unable to apply specific guidelines until all grades are in. So treat Learning Suite as a measure of performance, but not absolute indicator of final grades.

The grading %'s are assigned as follows:

Hw	15%
Quizzes	5%
Labs/Project	30%
Exams(3)	30%
Final Exam	20%

Homework:

Homework questions are assigned for each chapter. Homework assignments are to be turned in as a PDF on Learning Suite by 11:59pm on the due date. Graded HW will be returned via Learning Suite. Homework assignment due dates are listed on the schedule.

Note that some of the HW requires that you use the Internet to search for plausible answers, as detailed answers may not be sufficiently covered in the textbook.

NOTE: Narrative HW problems responses must be typed responses, not handwritten. Numerical problems can be hand written, but please be neat.

After-Class Quizzes:

After each lecture there will be an after-class quiz on Learning Suite that must be completed before the start of the next lecture. These quizzes are intended to help you understand some of the important concepts from the reading and lecture. The quizzes are open book and open note, but NOT open neighbor. You may retake the quiz ONCE with NO PENALTY. After that, each retake has a 5% penalty. These quizzes are worth 5% of your total grade. The lowest 3 quiz scores will be dropped for each student at the end of the term, to account for unusual student circumstances that do not permit them to attend class. There will be no allowance for students to make up missed quizzes.

Other Course Policies:

Late homework: 10% deduction for each day turned in late; no points (zero) will be given after the fifth late day from which the assignment was due.

Exams: If you must be absent during an exam due to extenuating circumstances, e.g., death in your immediate family, arrangements must be made with the instructor prior to the exam to schedule a date and time for which the make-up exam will be given. Please plan all family vacations, marriages, etc., accordingly so that you can attend the scheduled exam times. No make-up exams will be permitted without prior arrangements.

University policy on final exams states: Final examinations will be given at the times shown in the schedule. Examinations are not given early. The examination period is preceded by exam preparation days, which give time for conscientious review, study, and synthesis of the semester's work. The preparation and the examination periods are firmly scheduled parts of the semester; you must not make plans that interfere with these important academic activities. If illness or other uncontrollable circumstances prevent you from taking an examination at the scheduled time, you are responsible to inform the class instructor as soon as possible. Your instructor may give the grade Incomplete, depending on the circumstances. The incomplete cannot be given unless you and your instructor together prepare a contractual agreement.

Assignments

- **FERPA Release:** There is an online quiz that you must complete during the first week of class to either allow the return of assignments in a public location, or to

indicate that you will provide an unsealed envelope that will be used to return your assignments.

- **Homework:** Homework assignments for each chapter are posted on Learning Suite and are due on the day indicated (usually the date of the next class after we finish the chapter) by 11:59pm. Homework assignments must be turned in as a PDF submitted electronically on Learning Suite.
- **After-Class Quizzes:** After each lecture there will be an after-class quiz on Learning Suite that must be completed before the start of the next lecture. The quizzes are open book and open note, but NOT open neighbor. You may retake the quiz ONCE with NO PENALTY. After that, each retake has a 5% penalty. These quizzes are worth 5% of your total grade. The lowest 3 quiz scores will be dropped for each student at the end of the term, to account for unusual student circumstances that do not permit them to attend class. There will be no allowance for students to make up missed quizzes.
- **Labs + Lab Reports:** Each week you will attend your assigned lab time. During Lab you will have hands-on opportunities to learn and practice various manufacturing operations. The labs fall into 3 categories: (1) those for which you learn a manufacturing operation that is not required for your Final Project; (2) those for which you learn a manufacturing operation and use it to make a part for your Final Project (you will begin making it in lab, but may need to use Open Lab time to finish); (3) Open Lab time during which you will work on parts for your Final Project. For all labs except Open Lab, you will be required to turn in a Lab Report. A template for the Lab Report is posted on Learning Suite, which you must use (responding to each of the prompts). The Lab Reports are due before your next Lab time.
- **Pipsqueak Project:** The final project for this course involves the design and manufacture of a compressed air engine (a Pipsqueak Engine). This is a fun hands-on project that will allow you to learn and practice many manufacturing operations including machining, additive manufacturing (3D printing), casting, and powder metallurgy. You will have an opportunity to work on some of the parts for the engine during various labs, others you will complete during Open Labs and any

additional time outside of class that the shop is available. The primary deliverables for this project are:

1. **The Pipsqueak Engine:** This will be tested during one of the labs at the end of the semester and it must run, unassisted, for 30 seconds (Performance Test). The dimensions and tolerances of your parts will be tested by exchanging parts with two other groups in your lab (Tolerance Test) and then testing to make sure it still runs for 30 seconds unassisted. If the engine does not function properly after the exchange, the parts that were exchanged will be measured and the group whose parts are out of tolerance will have their score reduced.
2. **The Pipsqueak Report:** A full description of the report is included on Learning Suite.
3. **The Pipsqueak Presentation:** You will present the results of your report during one of the final labs of the semester. This will be a formal group presentation.

Point Breakdown

Categories	Percent of Grade
FERPA Release	0.1%
Lab/Project	29.38%
Exams	29.38%
Final Exam	19.59%
Homework	14.69%
After-Class Quizzes	4.9%
Extra Credit	1.96%

University Policies

Honor Code

In keeping with the principles of the BYU Honor Code, students are expected to be honest in all of their academic work. Academic honesty means, most fundamentally, that any work you present as your own must in fact be your own work and not that of another. Violations of this principle may result in a failing grade in the course and additional disciplinary action by the university. Students are also expected to adhere to the Dress and Grooming Standards. Adherence demonstrates respect for yourself and others and ensures an effective learning and working environment. It is the university's expectation, and every instructor's expectation in class, that each student will abide by all Honor Code standards. Please call the Honor Code Office at 422-2847 if you have questions about those standards.

Sexual Misconduct

As required by Title IX of the Education Amendments of 1972, the university prohibits sex discrimination against any participant in its education programs or activities. Title IX also prohibits sexual harassment-including sexual violence-committed by or against students, university employees, and visitors to campus. As outlined in university policy, sexual harassment, dating violence, domestic violence, sexual assault, and stalking are considered forms of "Sexual Misconduct" prohibited by the university.

University policy requires any university employee in a teaching, managerial, or supervisory role to report incidents of sexual misconduct that come to their attention through various forms including face-to-face conversation, a written class assignment or paper, class discussion, email, text, or social media post. If you encounter sexual misconduct, please contact the Title IX Coordinator at t9coordinator@byu.edu or 801-422-2130 or Ethics Point at <https://titleix.byu.edu/report> or 1-888-238-1062 (24-hours). Additional information about Title IX and resources available to you can be found at <http://titleix.byu.edu>.

Student Disability

Brigham Young University is committed to providing a working and learning atmosphere that reasonably accommodates qualified persons with disabilities. If

you have any disability which may impair your ability to complete this course successfully, please contact the University Accessibility Center (UAC), 2170 WSC or 422-2767. Reasonable academic accommodations are reviewed for all students who have qualified, documented disabilities. The UAC can also assess students for learning, attention, and emotional concerns. Services are coordinated with the student and instructor by the UAC. If you need assistance or if you feel you have been unlawfully discriminated against on the basis of disability, you may seek resolution through established grievance policy and procedures by contacting the Equal Employment Office at 422-5895, D-285 ASB.

Academic Honesty

The first injunction of the Honor Code is the call to "be honest." Students come to the university not only to improve their minds, gain knowledge, and develop skills that will assist them in their life's work, but also to build character. "President David O. McKay taught that character is the highest aim of education" (The Aims of a BYU Education, p.6). It is the purpose of the BYU Academic Honesty Policy to assist in fulfilling that aim. BYU students should seek to be totally honest in their dealings with others. They should complete their own work and be evaluated based upon that work. They should avoid academic dishonesty and misconduct in all its forms, including but not limited to plagiarism, fabrication or falsification, cheating, and other academic misconduct.

Devotional Attendance

Brigham Young University's devotional and forum assemblies are an important part of your BYU experience. President Cecil O. Samuelson said, "We have special and enlightening series of devotional and forum assemblies...that will complement, supplement, and enrich what will also be a very productive period in your classrooms, laboratories, and libraries. We look forward to being with you each Tuesday...and hope that you will regularly attend and bring your friends and associates with you...A large part of what constitutes the unique 'BYU experience' is found in these gatherings where the Spirit has been invited and where we have the opportunity to discuss and consider things of ultimate worth and importance that are not afforded to the academic community on

almost any other campus" (from the address "The Legacy of Learning", 30 August, 2005). Your attendance at each forum and devotional is strongly encouraged.

Inappropriate Use Of Course Materials

All course materials (e.g., outlines, handouts, syllabi, exams, quizzes, PowerPoint presentations, lectures, audio and video recordings, etc.) are proprietary. Students are prohibited from posting or selling any such course materials without the express written permission of the professor teaching this course. To do so is a violation of the Brigham Young University Honor Code.

Mental Health Concerns

Mental health concerns and stressful life events can affect students' academic performance and quality of life. BYU Counseling and Psychological Services (CAPS, 1500 WSC, 801-422-3035, caps.byu.edu) provides individual, couples, and group counseling, as well as stress management services. These services are confidential and are provided by the university at no cost for full-time students. For general information please visit <https://caps.byu.edu>; for more immediate concerns please visit <http://help.byu.edu>.

Plagiarism

Intentional plagiarism is a form of intellectual theft that violates widely recognized principles of academic integrity as well as the Honor Code. Such plagiarism may subject the student to appropriate disciplinary action administered through the university Honor Code Office, in addition to academic sanctions that may be applied by an instructor. Inadvertent plagiarism, which may not be a violation of the Honor Code, is nevertheless a form of intellectual carelessness that is unacceptable in the academic community. Plagiarism of any kind is completely contrary to the established practices of higher education where all members of the university are expected to acknowledge the original intellectual work of others that is included in their own work. In some cases, plagiarism may also involve violations of copyright law. Intentional Plagiarism- Intentional plagiarism is the deliberate act of representing the words, ideas, or data of another as one's own without providing proper attribution to the author

through quotation, reference, or footnote. Inadvertent Plagiarism-Inadvertent plagiarism involves the inappropriate, but non-deliberate, use of another's words, ideas, or data without proper attribution. Inadvertent plagiarism usually results from an ignorant failure to follow established rules for documenting sources or from simply not being sufficiently careful in research and writing. Although not a violation of the Honor Code, inadvertent plagiarism is a form of academic misconduct for which an instructor can impose appropriate academic sanctions. Students who are in doubt as to whether they are providing proper attribution have the responsibility to consult with their instructor and obtain guidance. Examples of plagiarism include: Direct Plagiarism-The verbatim copying of an original source without acknowledging the source. Paraphrased Plagiarism-The paraphrasing, without acknowledgement, of ideas from another that the reader might mistake for the author's own. Plagiarism Mosaic-The borrowing of words, ideas, or data from an original source and blending this original material with one's own without acknowledging the source. Insufficient Acknowledgement-The partial or incomplete attribution of words, ideas, or data from an original source. Plagiarism may occur with respect to unpublished as well as published material. Copying another student's work and submitting it as one's own individual work without proper attribution is a serious form of plagiarism.

Respectful Environment

"Sadly, from time to time, we do hear reports of those who are at best insensitive and at worst insulting in their comments to and about others... We hear derogatory and sometimes even defamatory comments about those with different political, athletic, or ethnic views or experiences. Such behavior is completely out of place at BYU, and I enlist the aid of all to monitor carefully and, if necessary, correct any such that might occur here, however inadvertent or unintentional. "I worry particularly about demeaning comments made about the career or major choices of women or men either directly or about members of the BYU community generally. We must remember that personal agency is a fundamental principle and that none of us has the right or option to criticize the lawful choices of another." President Cecil O. Samuelson, Annual University

Conference, August 24, 2010 "Occasionally, we ... hear reports that our female faculty feel disrespected, especially by students, for choosing to work at BYU, even though each one has been approved by the BYU Board of Trustees. Brothers and sisters, these things ought not to be. Not here. Not at a university that shares a constitution with the School of the Prophets." Vice President John S. Tanner, Annual University Conference, August 24, 2010

Schedule

Week	Lecture 1	Lecture 2	Lab
1	Ch. 21 Machining and Class intro	Ch. 22 Cutting Tool Materials	Safety and Pipsqueak intro
2	Ch. 23-24 Lathe and Mill Operations	Ch. 23-24 Cont.	Lathe and Mill
3	Ch. 25 Advanced Machining Concepts	Ch. 26-27 Abrasive Finishing/Advanced Machining	Lathe and Mill
4	Ch. 16 Sheet Metal Forming	Ch. 16 Cont.	Sheet Metal Bending and Process Sheets
5	Exam 1 review	Exam 1	Open Lab
6	Ch. 17-18 Metal Powders/ceramics & Glass	Ch. 17-18 Cont.	CNC and Powdered Metallurgy
7	Ch. 19-20 Plastics & Composites/Rapid Prototyping	Ch. 19-20 Cont.	CNC and Powdered Metallurgy
8	Exam 2 Review	Exam 2	Plastics/Additive MFG lab
9	Drama of Metal Forming Video	Ch. 13 – 14 Metal Rolling/Forging	Open Lab
10	Ch. 15 Metal Extrusion	Ch. 10 Metal Casting	Open Lab
11	Ch. 11 – 12 Metal Casting Processes/Economics	Ch. 11-12 Cont.	Metal Casting
12	Exam 3 Review	Exam 3	Welding
13	Ch. 28 Microelectronic Fab and	Ch. 29 MEMS Fabrication	Open Lab

14	Ch. 30 Fusion Welding	Ch. 31 Solid State Welding	Pipsqueak Presentations
15	Final Review	Final in Testing Center	No Lab

Course Development Project Grant
Proposal Name
July 27, 2016

OBJECTIVE

The objective of this course development proposal is to improve my ME EN 382 course in 3 specific ways: (1) support the department's writing thread, (2) improve the course project, (3) improve and standardize the curriculum. To accomplish this, I am requesting \$300 for materials as described below. An extended version of this proposal is included as part of my Faculty Development Plan (FDP), only the relevant portions are included below with the course development changes that will involve the use of these materials **highlighted**. I have received supplemental funding from my department to support 2 TAs during the 2016 Spring/Summer terms, who will be assisting with this course development project.

IMPACT

Improve the Course Project

I plan to improve the Pipsqueak Engine project by expanding the number of manufacturing operations that students use to produce their engines. Historically, the pipsqueak engines have been manufactured exclusively by machining operations. This past semester, I introduced the use of 3D printing and sand casting to produce the flywheels for the engine. The student response to this change was very positive, and I believe that **including additional manufacturing operations** would further benefit the students by giving them hands on experience with the manufacturing operations discussed in class and would enrich their learning experience. To accomplish this will require investigation of existing capabilities and their appropriateness for this project. It will also involve planning and prototyping the use of the new processes for the project, and generating instructions for students and future TAs.

Standardize & Improve Lectures and the Curriculum

I propose to improve the lecture format and content by developing **in-class demos** for each of the manufacturing processes that we cover and identifying **supporting media** for each of the processes. The assistance of the proposed TAs in demo development will be particularly valuable and will provide these students with an open ended, but reduced scope, design experience as well as more in-depth experience with these manufacturing processes.

I plan to hold weekly progress review/planning meetings with the TAs during which they will report their progress, we will discuss challenges and prioritize and make plans for the upcoming week.

BUDGET

\$300 for materials to develop in-class demos (e.g. materials to make a wax/chocolate sintering demo, paperclips for sheet metal spring-back demo, 3D printing of parts for demos, cutting parts for comparison of surface finish using different manufacturing operations), and include new manufacturing operations to the final course project.