



ARIZONA STATE UNIVERSITY
GENERAL STUDIES COURSE PROPOSAL COVER FORM

Course information:

Copy and paste current course information from Class Search/Course Catalog.

Academic Unit School for Engineering of Matter, Transport and Energy/Ira A. Fulton Schools of Engineering Department Materials Science and Engineering

Subject MSE Number 489 Title Capstone Design Project I Units: 1

Is this a cross-listed course? No
If yes, please identify course(s) _____

Is this a shared course? No If so, list all academic units offering this course _____

Course description: _____

Requested designation: (Choose One)

Note- a separate proposal is required for each designation requested

Eligibility:

Permanent numbered courses must have completed the university's review and approval process.
For the rules governing approval of omnibus courses, contact the General Studies Program Office at (480) 965-0739.

Area(s) proposed course will serve:

A single course may be proposed for more than one core or awareness area. A course may satisfy a core area requirement and more than one awareness area requirements concurrently, but may not satisfy requirements in two core areas simultaneously, even if approved for those areas. With departmental consent, an approved General Studies course may be counted toward both the General Studies requirement and the major program of study.

Checklists for general studies designations:

Complete and attach the appropriate checklist

- Literacy and Critical Inquiry core courses (L)
- Mathematics core courses (MA)
- Computer/statistics/quantitative applications core courses (CS)
- Humanities, Fine Arts and Design core courses (HU)
- Social and Behavioral Sciences core courses (SB)
- Natural Sciences core courses (SO/SG)
- Global Awareness courses (G)
- Historical Awareness courses (H)
- Cultural Diversity in the United States courses (C)

A complete proposal should include:

- Signed General Studies Program Course Proposal Cover Form
- Criteria Checklist for the area
- Course Syllabus
- Table of Contents from the textbook, and/or lists of course materials

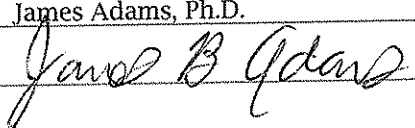
Contact information:

Name Mia Kroeger Phone 480-727-9318

Mail code 6106 E-mail: mia.kroeger@asu.edu

Department Chair/Director approval: (Required)

Chair/Director name (Typed): James Adams, Ph.D. Date: 10/4/12

Chair/Director (Signature): 



ARIZONA STATE UNIVERSITY
GENERAL STUDIES COURSE PROPOSAL COVER FORM

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Copy and paste current course information from Class Search/Course Catalog.

School for Engineering of Matter,
Transport and Energy/Ira A.
Fulton Schools of Engineering

Academic Unit _____ Department Materials Science and Engineering

Subject MSE Number 490 Title Capstone Design Project II Units: 2

Is this a cross-listed course? No
If yes, please identify course(s) _____

Is this a shared course? No If so, list all academic units offering this course _____

Course description: _____

Requested designation: (Choose One)

Note- a separate proposal is required for each designation requested

Eligibility:

Permanent numbered courses must have completed the university's review and approval process.
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Area(s) proposed course will serve:

A single course may be proposed for more than one core or awareness area. A course may satisfy a core area requirement and more than one awareness area requirements concurrently, but may not satisfy requirements in two core areas simultaneously, even if approved for those areas. With departmental consent, an approved General Studies course may be counted toward both the General Studies requirement and the major program of study.

Checklists for general studies designations:

Complete and attach the appropriate checklist

- Literacy and Critical Inquiry core courses (L)
- Mathematics core courses (MA)
- Computer/statistics/quantitative applications core courses (CS)
- Humanities, Fine Arts and Design core courses (HU)
- Social and Behavioral Sciences core courses (SB)
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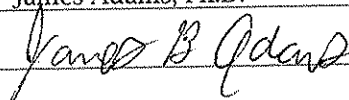
Contact information:

Name Mia Kroeger Phone 480-727-9318

Mail code 6106 E-mail: mia.kroeger@asu.edu

Department Chair/Director approval: (Required)

Chair/Director name (Typed): James Adams, Ph.D. Date: 10/4/12

Chair/Director (Signature): 

MSE 489 & 490 Addendum

I had a very helpful discussion with Barbara Fargotstein. She explained that the committee wanted a clarification statement in the syllabus that the credit for Literacy & Critical Inquiry is only provided if students complete both MSE 489 and 490. I have added this to the attached syllabi (and highlighted it).

I have also addressed the other point that was raised about clarifying that the plans in MSE 489 contained critical inquiry. Specifically, I have modified the syllabus for MSE 489 in the assignments for weeks 13 and 15, to stress that the sections on design criteria, literature review, and methodology needed to involve justification and critical thinking (see highlighted section of syllabus).

MSE 489 (1 credit)

Proposer: Please complete the following section and attach appropriate documentation.

ASU - [L] CRITERIA		
TO QUALIFY FOR [L] DESIGNATION, THE COURSE DESIGN MUST PLACE A MAJOR EMPHASIS ON COMPLETING CRITICAL DISCOURSE--AS EVIDENCED BY THE FOLLOWING CRITERIA:		
YES	NO	Identify Documentation Submitted
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>CRITERION 1: At least 50 percent of the grade in the course should depend upon writing, including prepared essays, speeches, or in-class essay examinations. <i>Group projects are acceptable only if each student gathers, interprets, and evaluates evidence, and prepares a summary report</i></p>
<p>1. Please describe the assignments that are considered in the computation of course grades--and indicate the proportion of the final grade that is determined by each assignment.</p>		
<p>2. Also:</p> <div style="border: 1px solid black; border-radius: 50%; padding: 10px; text-align: center;"> <p>Please circle, underline, or otherwise mark the information presented in the most recent course syllabus (or other material you have submitted) that verifies this description of the grading process--and label this information "C-1".</p> </div> <p style="text-align: center;">C-1</p>		
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>CRITERION 2: The composition tasks involve the gathering, interpretation, and evaluation of evidence</p>
<p>1. Please describe the way(s) in which this criterion is addressed in the course design</p>		
<p>2. Also:</p> <div style="border: 1px solid black; border-radius: 50%; padding: 10px; text-align: center;"> <p>Please circle, underline, or otherwise mark the information presented in the most recent course syllabus (or other material you have submitted) that verifies this description of the grading process--and label this information "C-2".</p> </div> <p style="text-align: center;">C-2</p>		
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>CRITERION 3: The syllabus should include a minimum of two substantial writing or speaking tasks, other than or in addition to in-class essay exams</p>
<p>1. Please provide relatively detailed descriptions of two or more substantial writing or speaking tasks that are included in the course requirements</p>		
<p>2. Also:</p> <div style="border: 1px solid black; border-radius: 50%; padding: 10px; text-align: center;"> <p>Please circle, underline, or otherwise mark the information presented in the most recent course syllabus (or other material you have submitted) that verifies this description of the grading process--and label this information "C-3".</p> </div> <p style="text-align: center;">C-3</p>		

ASU - [L] CRITERIA	
<input checked="" type="checkbox"/>	<input type="checkbox"/>
CRITERION 4: These substantial writing or speaking assignments should be arranged so that the students will get timely feedback from the instructor on each assignment in time to help them do better on subsequent assignments. <i>Intervention at earlier stages in the writing process is especially welcomed</i>	
1. Please describe the sequence of course assignments--and the nature of the feedback the current (or most recent) course instructor provides to help students do better on subsequent assignments	
2. Also:	
Please circle, underline, or otherwise mark the information presented in the most recent course syllabus (or other material you have submitted) that verifies this description of the grading process--and label this information " C-4 ".	
C-4	

MSE 489 Capstone Design Project I - Course Syllabus

1. Instructors

James B. Adams – ERC 281, jim.adams@asu.edu, 480-965-3316
Stephen Krause – ECG 221, skrause@asu.edu, 480 965-2050

2. Office Hours

James B. Adams
Stephen Krause

Appointments outside office hours may be arranged by email (preferred) or phone

3. Course Objectives and Expected Learning Outcomes

The goal of this course is to teach students how to plan an open-ended design project through practical experience with a semester-long design project of their choice, including experience with technical writing and technical presentations.

This class prepares students for MSE 490 (Capstone Design Project II), in which they actually conduct the design project they plan in this course.

4. Grading Policies

Weekly project reports: 10%

Initial Project Plan: 10%

Revised Project Plan: 20%

Detailed list of experiments, equipment needs, supply needs: 10%

Safety plan and GANTT chart: 10%

Presentation of final project plan: 20%

Written report of final project plan: 20%

5. Absence & Make-Up Policies

10% penalty if late 1 day; 5% penalty per day thereafter

Accommodations will be made for religious observances provided that students notify the instructor at the beginning of the semester concerning those dates. Students who expect to miss class due to officially university-sanctioned activities should inform the instructor early in the semester. Alternative arrangements will generally be made for any examinations and other graded in-class work affected by such absences.

6. Readings, Assignments, Examinations, Special Materials, Required Activities

No required textbook.

See below for detailed description of course

7. Classroom Behavior

Cell phones and pagers (must be/or state alternative rule) turned off during class to avoid causing distractions. The use of recording devices (is/is not) permitted during class. Any violent or threatening conduct by an ASU student in this class will be reported to the ASU Police Department and the Office of the Dean of Students.

CI

8. Academic Integrity

All students in this class are subject to ASU's Academic Integrity Policy (available at <http://provost.asu.edu/academicintegrity>) and should acquaint themselves with its content and requirements, including a strict prohibition against plagiarism. All violations will be reported to the Dean's office, who maintain records of all offenses

9. Disability Accommodations.

Suitable accommodations will be made for students having disabilities and students should notify the instructor as early as possible if they will require same. Such students must be registered with the Disability Resource Center and provide documentation to that effect.

Honors Students: This course is ideal for honors contracts, and can be substituted for part of your senior thesis by the addition of additional activities.

Type of Projects: Projects should satisfy the following criteria:

- 1) Be open-ended, with many possible solutions
- 2) Involve materials selection, materials design, process design, and/or design of testing procedures (at least one or more of the above is acceptable)
- 3) Have a technical mentor, either a faculty member or a professional engineer (usually not the instructor) whose technical expertise is relevant to the project.
- 4) Be approved by the instructor.

Examples of appropriate projects: evaluating a wide range of materials for a specific application, such as an automobile bumper, including all relevant criteria; developing a new testing procedure to determine acceptability of new materials; design of a composite blade for a helicopter; design of a new method to process oxide films to improve their electrical properties

Inappropriate projects would be those that do not include design, but are simply data collection. Some examples of inappropriate projects would be: standard fracture tests of 50 samples; constructing a piece of pre-designed equipment.

Teams: Students are encouraged to work in small teams to develop stronger team skills, but individual projects are allowed with consent of instructor. In every written report and oral presentation, each student's contribution should be made clear. Grading will be based on both the team's success and the individual contribution.

Industry Projects: Students are allowed to work on design projects suggested by local companies. These projects must meet the criteria described above.

Each company is asked to provide:

- 1) The general goals of the project
- 2) A technical mentor to meet with the student team 2-3x/month
- 3) Samples if needed

Also, the company has the option of providing access to equipment at their facilities, and/or funding for the students to do analysis work at ASU (ASU has extensive electron microscopy and other characterization facilities that can be used for student projects at greatly reduced rates).

Experimental Work: Projects should include a major laboratory component; i.e., not be just a design on paper. The laboratory work will be planned in MSE 489, and conducted in MSE 490.

Role of the Technical Mentor: The technical mentor should provide the minimum assistance necessary for the students to successfully complete the project, to ensure that the project is run by the students as much as possible. Regular meetings, preferably once/week, are required. The technical mentor will provide advice to the course instructor re. the student's final grade.

Role of the Course Instructor: The instructor will ensure that the students are making progress by reviewing the reports of the students, and providing feedback on their reports and final paper. The instructor will determine the final grade of the students, with input from the technical mentor.

Assignments:

Week 1: Possible project ideas/areas

Week 3: Report on progress (up to 1 page)

Week 5: Report on progress (up to 1 page)

Week 7: Initial Project Plan (1 page) – background, goals, design criteria, motivation/impact of proposed project, equipment needs, advisors

Week 9: Revised Project Plan (1 page) - precise set of design specifications (for example, improve adhesive strength to 1000 psi for a part exposed to temperatures up to 100 C for 20 hours in 100% humidity) – 20%

Week 11: Detailed list of experiments, equipment needs, supply needs; Safety plan; GANTT chart

Week 13: Presentation of final project plan

Goal

Motivation/Technological Impact of project

Design criteria – what exactly are the specifications you are designing for

Review literature, summarizing what has been done

Equipment needs and budget

Safety issues

Each team member's role

Week 15: Written report of final project plan (written by team)

Abstract – 1 page

(Goal, motivation, design criteria, lit review, equipment/supply needs, safety)

Goal – ½ page

Motivation/Technological Impact of project (1 page)

Design criteria – what exactly are the specifications you are designing for (1 page)



- Review literature, summarizing what has been done (2-3 pages)
- Equipment needs and budget (1 page)
- Safety issues (up to 1 page)
- Each team member's role (half page)

Portfolio: At the end of the semester the student should submit a portfolio including all the weekly reports, mid-semester report, final report, presentations, and any other relevant documentation.

Proposer: Please complete the following section and attach appropriate documentation.

ASU - [L] CRITERIA			
TO QUALIFY FOR [L] DESIGNATION, THE COURSE DESIGN MUST PLACE A MAJOR EMPHASIS ON COMPLETING CRITICAL DISCOURSE--AS EVIDENCED BY THE FOLLOWING CRITERIA:			
YES	NO		Identify Documentation Submitted
<input checked="" type="checkbox"/>	<input type="checkbox"/>	CRITERION 1: At least 50 percent of the grade in the course should depend upon writing, including prepared essays, speeches, or in-class essay examinations. <i>Group projects are acceptable only if each student gathers, interprets, and evaluates evidence, and prepares a summary report</i>	
1. Please describe the assignments that are considered in the computation of course grades--and indicate the proportion of the final grade that is determined by each assignment.			
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<input checked="" type="checkbox"/>	<input type="checkbox"/>	CRITERION 2: The composition tasks involve the gathering, interpretation, and evaluation of evidence	
1. Please describe the way(s) in which this criterion is addressed in the course design			
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ASU - [L] CRITERIA



CRITERION 4: These substantial writing or speaking assignments should be arranged so that the students will get timely feedback from the instructor on each assignment in time to help them do better on subsequent assignments. *Intervention at earlier stages in the writing process is especially welcomed*

1. Please describe the sequence of course assignments--and the nature of the feedback the current (or most recent) course instructor provides to help students do better on subsequent assignments

2. Also:

Please **circle, underline, or otherwise mark** the information presented in the most recent course syllabus (or other material you have submitted) that verifies **this description** of the grading process--and label this information "**C-4**".

C-4

MSE 490 Capstone Design Project II - Course Syllabus

1. Instructors

James B. Adams – ERC 281, jim.adams@asu.edu, 480-965-3316
Stephen Krause – ECG 221, skrause@asu.edu, 480 965-2050

2. Office Hours

James B. Adams
Stephen Krause

Appointments outside office hours may be arranged by email (preferred) or phone

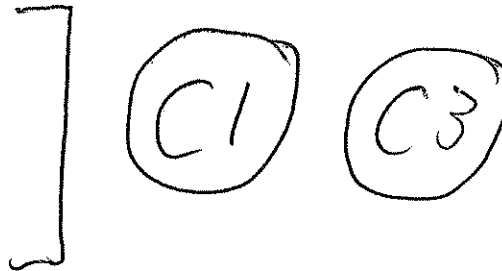
3. Course Objectives and Expected Learning Outcomes

The goal of this course is to teach students how to implement an open-ended design project through practical experience with a semester-long design project of their choice, including experience with technical writing and technical presentations.

This class is based on MSE 489 (Capstone Design Project I), in which the students plan their project. MSE 489 is a pre-requisite for this course.

4. Grading Policies

Weekly Reports: 10%
Preliminary Presentation: 10%
Preliminary Report: 10%
Poster Presentation: 10%
Materials Bow Presentation: 20%
Final Report: 40%



5. Absence & Make-Up Policies

10% penalty if late 1 day; 5% penalty per day thereafter

Accommodations will be made for religious observances provided that students notify the instructor at the beginning of the semester concerning those dates. Students who expect to miss class due to officially university-sanctioned activities should inform the instructor early in the semester. Alternative arrangements will generally be made for any examinations and other graded in-class work affected by such absences.

6. Readings, Assignments, Examinations, Special Materials, Required Activities

No required textbook.

See below for detailed description of course

7. Classroom Behavior

Cell phones and pagers (must be/or state alternative rule) turned off during class to avoid causing distractions. The use of recording devices (is/is not) permitted during class. Any violent or threatening conduct by an ASU student in this class will be reported to the ASU Police Department and the Office of the Dean of Students.

8. Academic Integrity

All students in this class are subject to ASU's Academic Integrity Policy (available at <http://provost.asu.edu/academicintegrity>) and should acquaint themselves with its content and requirements, including a strict prohibition against plagiarism. All violations will be reported to the Dean's office, who maintain records of all offenses

9. Disability Accommodations.

Suitable accommodations will be made for students having disabilities and students should notify the instructor as early as possible if they will require same. Such students must be registered with the Disability Resource Center and provide documentation to that effect.

Honors Students: This course is ideal for honors contracts, and can be substituted for part of your senior thesis by the addition of additional activities.

Type of Projects: Projects should satisfy the following criteria:

- 1) Be open-ended, with many possible solutions
- 2) Involve materials selection, materials design, process design, and/or design of testing procedures (at least one or more of the above is acceptable)
- 3) Have a technical mentor, either a faculty member or a professional engineer (usually not the instructor) whose technical expertise is relevant to the project.
- 4) Be approved by the instructor.

Examples of appropriate projects: evaluating a wide range of materials for a specific application, such as an automobile bumper, including all relevant criteria; developing a new testing procedure to determine acceptability of new materials; design of a composite blade for a helicopter; design of a new method to process oxide films to improve their electrical properties

Inappropriate projects would be those that do not include design, but are simply data collection. Some examples of inappropriate projects would be: standard fracture tests of 50 samples; constructing a piece of pre-designed equipment.

Teams: Students are encouraged to work in small teams to develop stronger team skills, but individual projects are allowed with consent of instructor. In every written report and oral presentation, each student's contribution should be made clear. Grading will be based on both the team's success and the individual contribution.

Industry Projects: Students are allowed to work on design projects suggested by local companies. These projects must meet the criteria described above.

Each company is asked to provide:

- 1) The general goals of the project
- 2) A technical mentor to meet with the student team 2-3x/month
- 3) Samples if needed

Also, the company has the option of providing access to equipment at their facilities, and/or funding for the students to do analysis work at ASU (ASU has extensive electron microscopy and other characterization facilities that can be used for student projects at greatly reduced rates).

Experimental Work: Projects should include a major laboratory component; i.e., not be just a design on paper. The laboratory work will be planned in MSE 489, and conducted in MSE 490.

Role of the Technical Mentor: The technical mentor should provide the minimum assistance necessary for the students to successfully complete the project, to ensure that the project is run by the students as much as possible. Regular meetings, preferably once/week, are required. The technical mentor will provide advice to the course instructor re. the student's final grade.

C4

Role of the Course Instructor: The instructor will ensure that the students are making progress by reviewing the reports of the students, and providing feedback on their reports and final paper. The instructor will determine the final grade of the students, with input from the technical mentor.

Assignments:

- Week 1: Project Report
- Week 2: Project Report
- Week 3: Project Report
- Week 4: Project Report
- Week 5: Preliminary Presentation
- Week 6: Preliminary Written Report
- Week 7: Project Report
- Week 8: Project Report
- Week 9: Project Report
- Week 10: Project Report
- Week 11: Preliminary Data Analysis
- Week 12: Poster Review
- Week 13: Powerpoint Presentation (in class)
- Week 14: Materials Bowl Competition (presentation and poster)
- Week 15: Initial Written Report submitted
- Finals: Final written Report submitted

C4 [

Project Reports: At the end of each week, each project should provide a weekly update on their progress, to both the technical mentor and the instructor. Team projects should clearly indicate each student's contribution (activities and number of hours spent), and each report should be approximately 1-2 pages in length.

C2

Preliminary Presentation and Written Report:
oral (15 minutes) and written (3-4 page executive summary):

C2

Title
Motivation
Background & Literature Review
Preliminary Progress
Equipment
Safety
DOE design: explain WHY each parameter was chosen
Preliminary data
Plans to successfully complete project
Characterization/Testing
Analysis of Data
Revised Budget
Time demands for completion (revised GANTT chart)

Materials Bowl Presentation: Each group will prepare a Powerpoint presentation, approximately 8-10 minutes long (8-10 slides). Powerpoint slides will be presented in class 1 week prior to the Materials Bowl.

C2

Powerpoint Slides:

- Easily readable from back of room – no letters less than 22 point font; font should be bold and not skinny (eg. **Arial Black** and not Times Roman); short phrases instead of sentences; no slide background that makes it difficult to read words
- Explain motivation clearly, so everyone understands why the design project is needed
- good graphics
- logically organized
- clear summary
- Highlight the team's unique innovation(s) and accomplishment(s)

Speaking:

- professional attire (for final presentation only)
- posture (no slouching)
- use of hands (not in pockets)
- relaxed, confident and professional demeanor
- enthusiastic
- make eye contact;
- loud enough so easily heard
- polished, smooth presentation (no pauses, flows well – ie, obviously practiced)
- smooth flow between speakers
- appropriate listening while others in team are presenting
- answer questions well
- Practice, practice, practice – so it goes smoothly

Final Report: about 15-25 pages of text (depending on team size), plus figures

Title

Executive Summary (1 page, with sections on Motivation, Goal, Method, Results, Summary)

Motivation

Background & Literature Review

Design Goals

Methodology

Results

Discussion – this should include a discussion of the relationship of structure, properties, processing, and performance wherever possible

Conclusion/Recommendation

References



List of who wrote which sections of the final report.

List of major activities by each group member and the time spent on them

(example: lit review: 5 hours; SEM: 10 hours; oral presentation: 5 hours; etc.)

Portfolio: At the end of the semester the student should submit a portfolio including all the weekly reports, mid-semester report, final report, presentations, and any other relevant documentation.

MSE 489 Capstone Design Project I - Course Syllabus

1. Instructors

James B. Adams – ERC 281, jim.adams@asu.edu, 480-965-3316

Stephen Krause – ECG 221, skrause@asu.edu, 480 965-2050

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Stephen Krause

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This class prepares students for MSE 490 (Capstone Design Project II), in which they actually conduct the design project they plan in this course.

4. Grading Policies

Weekly project reports: 10%

Initial Project Plan: 10%

Revised Project Plan: 20%

Detailed list of experiments, equipment needs, supply needs: 10%

Safety plan and GANTT chart: 10%

Presentation of final project plan: 20%

Written report of final project plan: 20%

5. Absence & Make-Up Policies

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9. Disability Accommodations.

Suitable accommodations will be made for students having disabilities and students should notify the instructor as early as possible if they will require same. Such students must be registered with the Disability Resource Center and provide documentation to that effect.

Literacy and Critical Thinking Credit – Students who take and pass both MSE 489 and MSE 490 may use the combination for credit for the Literacy and Critical Inquiry general studies requirement.

Honors Students: This course is ideal for honors contracts, and can be substituted for part of your senior thesis by the addition of additional activities.

Type of Projects: Projects should satisfy the following criteria:

- 1) Be open-ended, with many possible solutions
- 2) Involve materials selection, materials design, process design, and/or design of testing procedures (at least one or more of the above is acceptable)
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Also, the company has the option of providing access to equipment at their facilities, and/or funding for the students to do analysis work at ASU (ASU has extensive electron microscopy and other characterization facilities that can be used for student projects at greatly reduced rates).

Experimental Work: Projects should include a major laboratory component; i.e., not be just a design on paper. The laboratory work will be planned in MSE 489, and conducted in MSE 490.

Role of the Technical Mentor: The technical mentor should provide the minimum assistance necessary for the students to successfully complete the project, to ensure that the project is run by the students as much as possible. Regular meetings, preferably once/week, are required. The technical mentor will provide advice to the course instructor re. the student's final grade.

Role of the Course Instructor: The instructor will ensure that the students are making progress by reviewing the reports of the students, and providing feedback on their reports and final paper. The instructor will determine the final grade of the students, with input from the technical mentor.

Assignments:

Week 1: Possible project ideas/areas

Week 3: Report on progress (up to 1 page)

Week 5: Report on progress (up to 1 page)

Week 7: Initial Project Plan (1 page) – background, goals, design criteria, motivation/impact of proposed project, equipment needs, advisors;

Week 9: Revised Project Plan (1 page) - precise set of design specifications (for example, improve adhesive strength to 1000 psi for a part exposed to temperatures up to 100 C for 20 hours in 100% humidity) – 20%

Week 11: Detailed list of experiments, equipment needs, supply needs; Safety plan; GANTT chart

Week 13: Presentation of final project plan

Goal

Motivation/Technological Impact of project

Design criteria – what exactly are the specifications you are designing for

Review literature, summarizing what has been done, and explain why your plan is novel

Methodology – explain the methods you will use and justify why you chose them

Equipment needs and budget

Safety issues

Each team member's role

Week 15: Written report of final project plan (written by team)

Abstract – 1 page

(Goal, motivation, design criteria, lit review, equipment/supply needs, safety)

Goal – ½ page

Motivation/Technological Impact of project (1 page)

Design criteria – what exactly are the specifications you are designing for, and explain why you chose those criteria (1 page)

Review literature, summarizing what has been done, and explain why your plan is novel (2-3 pages)

Methodology – explain the methods you will use and justify why you chose them

Equipment needs and budget (1 page)

Safety issues (up to 1 page)

Each team member's role (half page)

Portfolio: At the end of the semester the student should submit a portfolio including all the weekly reports, mid-semester report, final report, presentations, and any other relevant documentation.

MSE 490 Capstone Design Project II - Course Syllabus

1. Instructors

James B. Adams – ERC 281, jim.adams@asu.edu, 480-965-3316

Stephen Krause – ECG 221, skrause@asu.edu, 480 965-2050

2. Office Hours

James B. Adams

Stephen Krause

Appointments outside office hours may be arranged by email (preferred) or phone

3. Course Objectives and Expected Learning Outcomes

The goal of this course is to teach students how to implement an open-ended design project through practical experience with a semester-long design project of their choice, including experience with technical writing and technical presentations.

This class is based on MSE 489 (Capstone Design Project I), in which the students plan their project. MSE 489 is a pre-requisite for this course.

4. Grading Policies

Weekly Reports: 10%

Preliminary Presentation: 10%

Preliminary Report: 10%

Poster Presentation: 10%

Materials Bow Presentation: 20%

Final Report: 40%

5. Absence & Make-Up Policies

10% penalty if late 1 day; 5% penalty per day thereafter

Accommodations will be made for religious observances provided that students notify the instructor at the beginning of the semester concerning those dates. Students who expect to miss class due to officially university-sanctioned activities should inform the instructor early in the semester. Alternative arrangements will generally be made for any examinations and other graded in-class work affected by such absences.

6. Readings, Assignments, Examinations, Special Materials, Required Activities

No required textbook.

See below for detailed description of course

7. Classroom Behavior

Cell phones and pagers (must be/or state alternative rule) turned off during class to avoid causing distractions. The use of recording devices (is/is not) permitted during class. Any violent or threatening conduct by an ASU student in this class will be reported to the ASU Police Department and the Office of the Dean of Students.

8. Academic Integrity

All students in this class are subject to ASU's Academic Integrity Policy (available at <http://provost.asu.edu/academicintegrity>) and should acquaint themselves with its content and requirements, including a strict prohibition against plagiarism. All violations will be reported to the Dean's office, who maintain records of all offenses

9. Disability Accommodations.

Suitable accommodations will be made for students having disabilities and students should notify the instructor as early as possible if they will require same. Such students must be registered with the Disability Resource Center and provide documentation to that effect.

Literacy and Critical Thinking Credit – Students who take and pass both MSE 489 and MSE 490 may use the combination for credit for the Literacy and Critical Inquiry general studies requirement.

Honors Students: This course is ideal for honors contracts, and can be substituted for part of your senior thesis by the addition of additional activities.

Type of Projects: Projects should satisfy the following criteria:

- 1) Be open-ended, with many possible solutions
- 2) Involve materials selection, materials design, process design, and/or design of testing procedures (at least one or more of the above is acceptable)
- 3) Have a technical mentor, either a faculty member or a professional engineer (usually not the instructor) whose technical expertise is relevant to the project.
- 4) Be approved by the instructor.

Examples of appropriate projects: evaluating a wide range of materials for a specific application, such as an automobile bumper, including all relevant criteria; developing a new testing procedure to determine acceptability of new materials; design of a composite blade for a helicopter; design of a new method to process oxide films to improve their electrical properties

Inappropriate projects would be those that do not include design, but are simply data collection. Some examples of inappropriate projects would be: standard fracture tests of 50 samples; constructing a piece of pre-designed equipment.

Teams: Students are encouraged to work in small teams to develop stronger team skills, but individual projects are allowed with consent of instructor. In every written report and oral presentation, each student's contribution should be made clear. Grading will be based on both the team's success and the individual contribution.

Industry Projects: Students are allowed to work on design projects suggested by local companies. These projects must meet the criteria described above.

Each company is asked to provide:

- 1) The general goals of the project
- 2) A technical mentor to meet with the student team 2-3x/month

3) Samples if needed

Also, the company has the option of providing access to equipment at their facilities, and/or funding for the students to do analysis work at ASU (ASU has extensive electron microscopy and other characterization facilities that can be used for student projects at greatly reduced rates).

Experimental Work: Projects should include a major laboratory component; i.e., not be just a design on paper. The laboratory work will be planned in MSE 489, and conducted in MSE 490.

Role of the Technical Mentor: The technical mentor should provide the minimum assistance necessary for the students to successfully complete the project, to ensure that the project is run by the students as much as possible. Regular meetings, preferably once/week, are required. The technical mentor will provide advice to the course instructor re. the student's final grade.

Role of the Course Instructor: The instructor will ensure that the students are making progress by reviewing the reports of the students, and providing feedback on their reports and final paper. The instructor will determine the final grade of the students, with input from the technical mentor.

Assignments:

- Week 1: Project Report
- Week 2: Project Report
- Week 3: Project Report
- Week 4: Project Report
- Week 5: Preliminary Presentation
- Week 6: Preliminary Written Report
- Week 7: Project Report
- Week 8: Project Report
- Week 9: Project Report
- Week 10: Project Report
- Week 11: Preliminary Data Analysis
- Week 12: Poster Review
- Week 13: Powerpoint Presentation (in class)
- Week 14: Materials Bowl Competition (presentation and poster)
- Week 15: Initial Written Report submitted
- Finals: Final written Report submitted

Project Reports: At the end of each week, each project should provide a weekly update on their progress, to both the technical mentor and the instructor. Team projects should clearly indicate each student's contribution (activities and number of hours spent), and each report should be approximately 1-2 pages in length.

Preliminary Presentation and Written Report:

oral (15 minutes) and written (3-4 page executive summary):

Title

Motivation

Background & Literature Review

Preliminary Progress

Equipment

Safety

DOE design: explain WHY each parameter was chosen

Preliminary data

Plans to successfully complete project

Characterization/Testing

Analysis of Data

Revised Budget

Time demands for completion (revised GANTT chart)

Materials Bowl Presentation: Each group will prepare a Powerpoint presentation, approximately 8-10 minutes long (8-10 slides). Powerpoint slides will be presented in class 1 week prior to the Materials Bowl.

Powerpoint Slides:

- Easily readable from back of room – no letters less than 22 point font; font should be bold and not skinny (eg. **Arial Black** and not Times Roman); short phrases instead of sentences; no slide background that makes it difficult to read words
- Explain motivation clearly, so everyone understands why the design project is needed
- good graphics
- logically organized
- clear summary
- Highlight the team's unique innovation(s) and accomplishment(s)

Speaking:

- professional attire (for final presentation only)
- posture (no slouching)
- use of hands (not in pockets)
- relaxed, confident and professional demeanor
- enthusiastic
- make eye contact;
- loud enough so easily heard
- polished, smooth presentation (no pauses, flows well – ie, obviously practiced)
- smooth flow between speakers
- appropriate listening while others in team are presenting
- answer questions well
- Practice, practice, practice – so it goes smoothly

Final Report: about 15-25 pages of text (depending on team size), plus figures

Title

Executive Summary (1 page, with sections on Motivation, Goal, Method, Results, Summary)

Motivation

Background & Literature Review

Design Goals

Methodology

Results

Discussion – this should include a discussion of the relationship of structure, properties, processing, and performance wherever possible

Conclusion/Recommendation

References

List of who wrote which sections of the final report.

List of major activities by each group member and the time spent on them

(example: lit review: 5 hours; SEM: 10 hours; oral presentation: 5 hours; etc.)

Portfolio: At the end of the semester the student should submit a portfolio including all the weekly reports, mid-semester report, final report, presentations, and any other relevant documentation.
