Office of the Registrar
FORM 40 REV. 2/11

MSE 489DD
201610

PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION, OR REVISION OF AN UNDERGRADUATE COURSE (10000-40000 LEVEL)

DEPARTMENT: School of Materials Engineering — EFFECTIVE SESSION: Fall 2015

INSTRUCTIONS: Please check the items below which describe the purpose of this request.

- ☑ 1. New course with supporting documents
- ☐ 2. Add existing course offered at another campus
- ☐ 3. Expiration of a course
- ☐ 4. Change in course number
- ☐ 5. Change in course title
- ☐ 6. Change in course credit/type
- ☐ 7. Change in course attributes (department head signature only)
- ☐ 8. Change in instructional hours
- ☐ 9. Change in course description
- ☐ 10. Change in course requisites
- ☐ 11. Change in semesters offered (department head signature only)
- ☐ 12. Transfer from one department to another

PROPOSED:		EXISTING:	
Subject Abbreviation	MSE	Subject Abbreviation	
Course Number	489	Course Number	
Long Title	Ethics in Engineering Practice		
Short Title	Ethics in Engineering Practice		

Abbreviated title will be entered by the Office of the Registrar if omitted. (30 CHARACTERS ONLY)

TERMS OFFERED (Check All That Apply): ☐ Summer ☑ Fall ☑ Spring

CAMPUS(ES) INVOLVED: ☐ Calumet ☐ N. Central ☐ Cont Ed ☐ Tech Statewide ☐ Ft. Wayne ☑ W. Lafayette ☐ Indianapolis

CREDIT TYPE

1. Fixed Credit Cr. Hrs: 3
2. Variable Credit Range: Minimum Cr. Hrs (Check One) To ☐ Or ☐ Maximum Cr. Hrs
3. Equivalent Credit: Yes ☐ No ☐

COURSE ATTRIBUTES: Check All That Apply

1. Pass/Not Pass Only ☐
2. Satisfactory/Unsatisfactory Only ☐
3. Repeatable ☐ Maximum Repeatable Credit ☐
4. Credit by Examination ☐
5. Fees ☐ Coop ☐ Lab ☐ Rate Request — Include comment to explain fee
6. Registration Approval Type — Department ☐ Instructor ☐
7. Variable Title ☐
8. Honors ☐
9. Full Time Privilege ☐
10. Off Campus Experience ☐

Schedule Type	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture	50	3	15	100
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

Restrictions: Junior or senior standing in the College of Engineering
Description: Presentation and discussion of common ethical theories, including ethical egoism, legal positivism, utilitarianism, duties and rights, virtue ethics. Application of these theories to the practice of engineering, including professionalism, codes of ethics, trust and loyalty, confidentiality, whistle blowing, respect for legitimate authority, risk and reliability, research fraud. Examples of application of ethical theory and case studies drawn from across the engineering profession and include discussion of the interrelated technical and ethical issues.

COURSE LEARNING OUTCOMES

The students should be able to (1) identify and discuss common ethical theories; (2) describe how these theories apply these theories to the practice of engineering; (3) analyze case studies of failures of engineering products and organizations.

Calumet Department Head	Date	Calumet School Dean	Date
Fort Wayne Department Head	Date	Fort Wayne School Dean	Date
Indianapolis Department Head	Date	Indianapolis School Dean	Date
North Central Faculty Senate Chair	Date	Vice Chancellor for Academic Affairs	Date
West Lafayette Department Head	4/6/14 Date	West Lafayette College/School Dean	4/20/15 Date
		West Lafayette Registrar	5/4/15 Date

OFFICE OF THE REGISTRAR

RECEIVED
APR 17 2015
OFFICE OF THE REGISTRAR

lyz 4/30/15

TO: The Faculty of the College of Engineering

FROM: School of Materials Engineering

RE: New Undergraduate Course, MSE 48900 *Ethics in Engineering Practice*

The faculty of the School of Materials Engineering have approved the following new course. This action is now submitted to the Engineering Faculty with a recommendation for approval.

MSE 489 Ethics in Engineering Practice
Sem. 1, 2, Lecture 3, Cr.3.
Restrictions: Junior or senior standing in the College of Engineering

Description: Presentation and discussion of common ethical theories, including ethical egoism, legal positivism, utilitarianism, duties and rights, virtue ethics. Application of these theories to the practice of engineering, including professionalism, codes of ethics, trust and loyalty, confidentiality, whistleblowing, respect for legitimate authority, risk and reliability, research fraud. Examples of application of ethical theory and case studies drawn from across the engineering profession and include discussion of the interrelated technical and ethical issues.

Reason: The practice of engineering allows us many opportunities to aid our society and the individuals in it. However, it also presents many situations in which an engineer can do harm through incompetence, malice, or inaction. There have been many well-documented engineering failures, including the losses of the *Challenger* and the *Columbia*, the Kansas City Hyatt Regency skywalk collapse, and the *Deepwater Horizon* oil spill, as well as several high-profile cases of academic and scientific dishonesty in research. In each case, an individual or a group was faced with ethical dilemmas in the performance of their jobs. Engineers and managers made poor choices that had substantial impact on many people and have been the subject of significant public scrutiny. The purpose of this course is to provide a venue where students can learn and discuss the application of ethics in their work and research environments.

This course was developed with support from the College of Engineering *Engineer of 2020* program and has been offered 3 times (Spring 2010, Spring 2012, Fall 2013) with an enrollment of 15-20 students each time.

Prof. David F. Bahr, Head
School of Materials Engineering

Approved for the faculty of the Schools of Engineering by the Engineering Curriculum Committee
ECC Minutes #9 Date 11/24/15
Chairman ECC

MSE 497 Ethics in Engineering Practice
Spring 2012

Instructors: Dr. Matthew J. M. Krane ARMS 2231 krane@ecn.purdue.edu

Required Textbooks:

Ethics: Discovering Right and Wrong (6th ed.), Louis P. Pojman and James Fieser, Wadsworth Publishing, 2008, ISBN-13: 978-0495502357.

Nicomachean Ethics, Aristotle, 2nd ed, Hackett Publishing Co., 1999, ISBN-13: 978-0872204645

(There will be many other readings provided from a variety of sources.)

Syllabus:

The practice of engineering allows us many opportunities to aid our society and the individuals in it. However, it also presents many situations in which an engineer can do harm through incompetence, malice, or inaction. There have been many well-documented engineering failures, including the losses of the *Challenger* and the *Columbia*, the Kansas City Hyatt Regency skywalk collapse, and the *Deepwater Horizon* oil spill, as well as several high-profile cases of academic and scientific dishonesty in research. In each case, an individual or a group was faced with ethical dilemmas in the performance of their jobs. Engineers and managers made poor choices that had substantial impact on many people and have been the subject of significant public scrutiny. The purpose of this course is to provide a venue where students can learn and discuss the application of ethics in their work and research environments.

The course includes:

- Presentation and discussion of common ethical theories;
- Application of these theories to the practice of engineering;
- Presentation/discussion of case studies of failures of engineering products and organizations.

Examples of application of ethical theory and case studies are drawn from across the engineering profession and include discussion of the interrelated technical and ethical issues.

Evaluation:

25%	final exam (comprehensive)
25%	midterm exam
45%	writing assignments
5%	journal from reading assignments

Reading journal:

The reading in this class should be done *before* the class period in which it will be discussed. Completion of the reading will allow the students to better understand the lecture, to participate in discussions, and to ask pertinent questions. To aid in reading comprehension, the students are *required* to keep a journal of the reading assignments. In this journal, a summary of each assignment will be made which will not be graded for style, but for coverage. The purpose is to encourage careful reading and aid in committing the major ideas to memory. Students will be responsible for the material in the readings, although not all of it will be covered in the lecture.

MSE 497 Ethics in Engineering Practice
Spring 2012

	Mtg	Date	Topics	Reading Assignments
	L1	Jan 9	Class Intro	
1	L2	Jan 11	General Case Studies	
	L3	Jan 13	What Elements Should Ethical Theory Consider?	Pojman, Ch. 1
		Jan 16	MLK Day	
2	L4	Jan 18	writing workshop	Pojman: Appendix
	L5	Jan 20	Ethical Relativism/Ethical Egoism	Rachels; Pojman: Ch. 2
	L6	Jan 23	Ethical Relativism/Ethical Egoism	Pojman: pp. 81-95
3	L7	Jan 25	Min conception of ethics/Natural Law	Pojman: Ch. 3
	L8	Jan 27	Natural Law	
	L9	Jan 30	Utilitarianism	Pojman: Ch7
4	L10	Feb 1	Utilitarianism/Duty based ethics	Pojman: Ch8
	L11	Feb 3	Duty based ethics	
	L12	Feb 6	Natural/human rights	Pojman
5	L13	Feb 8	Natural/human rights	
	L14	Feb 10	Virtue based ethics	Pojman Ch 9.; Aristotle, *Nic. Ethics I*
	L15	Feb 13	Virtue based ethics	Aristotle, *Nic. Ethics II, III (1-5)*
6	L16	Feb 15	Virtue based ethics	Aristotle, *Nic. Ethics III (6-12), IV*
	L17	Feb 17	Virtue based ethics	Aristotle, *Nic. Ethics V*
	L18	Feb 20	Virtue based ethics	Aristotle, *Nic. Ethics VI*
7	L19	Feb 22	Virtue based ethics	Aristotle, *Nic. Ethics VII*
	L20	Feb 24	Virtue based ethics	Aristotle, *Nic. Ethics VIII, IX*
	L21	Feb 27	Virtue based ethics	Aristotle, *Nic. Ethics X*
8	L22	Feb 29	Professionalism	Davis (1997); Harris (2008)
	L23	Mar 2	Professional virtues	
	L24	Mar 5	Professional Codes of Ethics	NSPE Code of Ethics
9	L25	Mar 7	Midterm Exam (covers lectures 1-21)	
	L26	Mar 9	*Case study: KC Hyatt*	
10		3/14-16	Spring Break	
	L27	Mar 19	Product liability -- interaction with legal profession: guest speaker Michael Lotus (civil litigator)	
11	L28	Mar 21	*Case Study: CitiCorp Building*	
	L29	Mar 23	Risk and Reliability	Harris Ch 7; Martin Schinzinger Ch 4
	L30	Mar 26	Risk and Reliability- technical examples	
12	L31	Mar 28	Trust and loyalty-responsibility to employers	Martin Schinzinger Ch 5
		Mar 30	Trust and loyalty-Whistleblowing	
	L32	Apr 2	The role of organizational culture	Pinkus, Ch. 1-3
13	L33	Apr 4	The role of organizational culture	
	L34	Apr 6	Conflict of Interest	
	L35	Apr 9	*Case Study: Challenger Launch decision*	Pinkus, Appendix
14	L36	Apr 11	*Case Study: UA Flight 232, CC Flight 3407*	
	L37	Apr 13	Milgram experiments (focus on exp. results)	Milgram (1963)
	L38	Apr 16	Milgram experiments (focus on exp. results)	Milgram (1963)
15	L39	Apr 18	Milgram experiments (focus on exp. design)	McArthur (2009), Milgram (1974)
	L40	Apr 20	Research fraud	
	L41	Apr 23	Research fraud	
16	L42	Apr 25		
	L43	Apr 27	Class wrap up	