Office of the Registrar
FORM 40 REV. 12/09

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

EFD 19-10

DEPARTMENT: School of Chemical Engineering

EFFECTIVE SESSION: Fall 2010 SF 2011

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

- [x] 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	CHE	Subject Abbreviation	
Course Number	46300	Course Number	
Long Title	Applications of Chemical Engineering Principles		
Short Title	Applications of CHE Principles		

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

TERMS OFFERED
Check All That Apply:
[ ] Summer [x] Fall [ ] Spring

CAMPUS(ES) INVOLVED
[ ] Calumet [ ] N. Central
[ ] Cont Ed [ ] Tech Statewide
[ ] Ft. Wayne [x] 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. Special Fees [ ]
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	16	100
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
stance				
inic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

Team-based design projects in materials transport, heat transfer, mass transfer, separations, chemical reactors. Emphasis on team operation and decision-making. Consideration of current technical challenges, societal and economic issues. Prerequisite: CHE 37800

*COURSE LEARNING OUTCOMES

- Demonstrate ability to apply principles of chemical engineering to design practical systems. (1, 3, 5)
- Participate in team-based projects to understand team operation and decision-making. (4)
- Gain experience in and appreciation of the need for individual learning about new systems, equipment, etc. (9)
- Understand the role of the engineer in promoting safe operation and consideration of environmental issues in technical decisions. (6, 8)
- Develop an appreciation of current issues and challenges which you may well be addressing as professionals. (8)

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
est Lafayette Department Head: AVarma	Date: 5-12-10	West Lafayette College/School Dean: [signature]	Date: 5/24/2010
West Lafayette Registrar: [signature]	Date: 9/10/10		

OFFICE OF THE REGISTRAR

9-9-10 AT-V

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(Check One) To ☐ Or ☐
Maximum Cr. Hrs
3. Equivalent Credit: Yes ☐ No ☐

COURSE ATTRIBUTES: Check All That Apply
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2. Satisfactory/Unsatisfactory Only ☐
3. Repeatable ☐
Maximum Repeatable Credit: ☐
4. Credit by Examination ☐
5. Special Fees ☐
6 Registration Approval Type
Department ☐ Instructor ☐
7 Variable Title ☐
8 Honors ☐
9 Full Time Privilege ☐
10 Off Campus Experience ☐

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North Central Faculty Senate Chair	Date	Vice Chancellor for Academic Affairs	Date
AVarma · 5-12-10 West Lafayette Department Head	Date	West Lafayette College/School Dean	Date

West Lafayette Registrar Date

OFFICE OF THE REGISTRAR

To: Faculty of the College of Engineering

From: Faculty of the School of Chemical Engineering

RE: New Undergraduate Course, CHE 46300, Applications of Chemical Engineering Principles

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

CHE 46300: Applications of Chemical Engineering Principles
Sem 1, cr. 3, LEC 3
Prerequisite: CHE 37800 or equivalent or permission of Instructor

Description: Team-based design projects in materials transport, heat transfer, mass transfer, separations, chemical reactors. Emphasis on team operation and decision-making. Consideration of current technical challenges, societal and economic issues.

Reason: The course has been taught as **Applications of Chemical Engineering Principles**, CHE 497B, in the spring semester of AY2007 with 21 students, in the fall semester of AY2008 with 42 students, and in the fall semester of 2009 with 47 students as CHE 49700. The course provides students planning an industrial career experience in the application of chemical engineering fundamentals to practical situations and decision-making.

AVarma

A. Varma, Head
School of Chemical Engineering
Date: 2/22/10

APPROVED FOR THE FACULTY
OF THE SCHOOLS OF ENGINEERING
BY THE ENGINEERING
CURRICULUM COMMITTEE

ECC Minutes #25

Date 4/27/10

Chairman ECC R. Cipra

Supporting Documentation – CHE 46300, Applications of Chemical Engineering Principles

Level: Undergraduate
Course Instructor: R. Neal Houze

Textbook: ***Unit Operations of Chemical Engineering*** (7th ed.), W.L. McCabe, J.C. Smith, & P. Harriott, McGraw-Hill, 2005

Course Operation: Three or four person teams work on design projects of about three-week duration. Team membership changes three times during the semester to give students opportunities to work with a variety of individuals. Class sessions are utilized to review and/or introduce relevant topical materials and work through practice problems. Most class sessions also discuss a newsworthy issue – technical, political, regulatory, or safety – which has recently been reported in the press or technical literature. Problem-solving skills are emphasized and bases for technical decisions. Heuristics are presented and utilized in the design projects. Teams submit technical reports with technical memos which are the basis for the team's grade. Each team member assesses the teamwork of the other members and this assessment is factored into the grade.
Project topics are solicited from industrial contacts and students who have had significant practical work experiences during their academic tenure (Co-Op or internships).

Topics Covered in previous semesters:

- Design of piping system including pump selection, flow meter selection and calibration, control valve selection, and operability of system
- Design of heat exchange equipment (shell-and-tube exchanger, air-cooled fin-fan exchanger) and economic analysis of alternatives
- Design and/or certification of a forced-draft cooling tower
- Design of a continuous stirred-tank reactor (CSTR) based on mixing (mass transfer) limitations
- Design of a CSTR or a plug-flow reactor based on kinetic limitations
- Design of a filtration system to recover pharmaceutical grade particulate material
- Design of an absorber system to remove pollutants from a waste gas stream
- Conditioned air system design
- Process Troubleshooting
- Process Debottlenecking
- Process safety
- Grand Challenges for the 21st century
- Modern information retrieval
- Effective Communication
- Team Organization and Operation

Course Objectives: Develop abilities to apply chemical engineering principles to practical situations to design, analyze operations, or predict operability of systems.

Course Outcomes: (numbers in parentheses refer to related educational outcomes of our undergraduate chemical engineering program)

- Demonstrate ability to apply principles of chemical engineering to design practical systems. (1, 3, 5)
- Participate in team-based projects to understand team operation and decision-making. (4)
- Gain experience in and appreciation of the need for individual learning about new systems, equipment, etc. (9)
- Understand the role of the engineer in promoting safe operation and consideration of environmental issues in technical decisions. (6, 8)
- Develop an appreciation of current issues and challenges which you may well be addressing as professionals. (8)

Assessment Methods for Outcomes: The outcomes are assessed through the written project reports submitted by the teams, regular meetings with each of the teams, peer assessment of the team members, and oral presentations of project results.