COURSE #, CREDITS : CHE 489 (3 CREDITS)	COURSE TITLE: CHEMICAL PRODUCT DESIGN II
TERM OFFERED: Winter	PREREQUISITES: ChE 488
TEXTBOOKS/REQUIRED MATERIAL: None	COGNIZANT FACULTY: Gulari, Schwank, Montgomery, Tadd, Wisnieski
INSTRUCTORS: Gulari, Wisnieski	FACULTY APPROVAL: 2014-04-28

CoE BULLETIN DESCRIPTION:
Part two of a two-semester chemical product design sequence. Teams produce a consumer-ready prototype of a chemical product. Development of control and regulatory tests to ensure the product meets all relevant industrial, federal and local regulations. Oral and written technology and economic reports. Safety, environmental and ethical issues.

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COURSE TOPICS:

1. Team dynamics and interpersonal relationships (1)
2. Process drawings and analysis (1)
3. Process Design (4)
4. Product & Process Economics (4)
5. Developmental requirements & Experimental evaluation (16)
6. Energy integration (1)
7. Sustainability and environment (3)
8. Intellectual property issues (2)
9. Ethics (3)
10. Team meetings with instructor (4)
11. Technical communication (8

COURSE STRUCTURE/SCHEDULE: Lecture: 1 per week, 1.5 hour, with lab time available for project work

COURSE OBJECTIVES	Links shown in brackets are to course outcomes that satisfy these objectives. 1. To provide a basis for students to function effectively in teams on a major project [9,10]. 2. To equip students to conceptualize and develop effective product designs [1, 4-8]. 3. To equip students to design products consistent with the constraints that govern (process, environmental, safety, regulatory) [4,8]. 4. To provide experience structuring and designing laboratory work to develop and validate a design. [7]. 5. To develop students' skills in written and oral technical communication [2-3]. 6. To equip students to integrate economic realities into all stages of the Design and Development process [4,6]. 7. To integrate and apply subject matter from previous courses to solve open ended problems [4-8].
COURSE OUTCOMES	Links shown in brackets are to program educational outcomes.(a-k) 1. Research and analyze technical and business related information [a,i]. 2. Write, edit, revise, and critique technical memos and formal written reports [g]. 3. Prepare and present effective oral reports [g]. 4. Design a product that meets the engineering and economic requirements defined by the marketplace [c,j]. 5 Assemble a logical sequence of interconnected unit operations to produce the product designed [c]. 6. Assess the economic impact of a product and its related production process [c]. 7. Design a development program to enable and validate a design [c]. 8. Account for environmental, safety and applicable regulatory issues in designing a product [c]. 9. Work as a member of a team [d]. 10. Recognize and analyze professional situations requiring ethical decisions [f].
ASSESSMENT TOOLS	1. Regular team meetings with the course instructors and peer evaluations assess course outcomes 7, 9 2. Oral reports assess outcomes 1,2-8 3. Written reports assess outcomes 1-2, 4-6, 8 4. An individual assignment assessed outcome 10