The University Of Toledo

NEW COURSE PROPOSAL

1. College: RINO
   Department:

2. Contact Person: Will. Ted Evans
   Phone: 530-3349
   Email: william.evans@utoledo.edu

3. Alpha/Numeric Code (subject area - number): GNEN 6790

4. Proposed title:
   Information Accelerated Radical Innovation

5. Proposed effective term:

6. Planned enrollment per section: 15 per term: 15

7. Is the course cross-listed with another academic unit? 
   Yes [X] No

8. Is the course offered at more than one level? 
   Yes [X] No

9. Approval of other academic unit (signature)

10. Credit hours: Fixed: 3 or Variable: 
    to

11. Terms offered: Fall [X] Spring [X] Summer

12. Years offered: 
    Every Year Alternate Years

13. Are students permitted to register for more than one section during a term? 
    Yes [X] No

14. May the courses be repeated for credit? 
    Yes [X] No

15. Grade Only: 
    Normal Grading (A-F)
    Credit/No Credit

16. Graduation: 
    Undergraduate
    Passing Grade/No Credit (A-C, NC)
    Credit/No Credit
    Graduate
    Normal Grading (A-F)
    Passing Grade/No Credit (A-C, NC)
    Credit/No Credit

17. Administrative Use Only
    Code:
    Effective Date: 
    CIP Code: 
    Field:
    Program:
    Level:

18. Course Modification must be completed.

19. Designation of Course: 

20. Proposed title: 
   Information Accelerated Radical Innovation

21. Proposed effective term:

22. Planned enrollment per section: 15 per term: 15

23. Is the course cross-listed with another academic unit? 
   Yes [X] No

24. Is the course offered at more than one level? 
   Yes [X] No

25. If yes to either question, please list additional Alpha/Numeric codes, and 
    submit a separate New Course form or Course Modification form for the 
    course(s) referenced below.

26. Contact Person: Will. Ted Evans
   Phone: 530-3349
   Email: william.evans@utoledo.edu

27. Alpha/Numeric Code (subject area - number): GNEN 6790

28. Proposed title:
   Information Accelerated Radical Innovation

29. Proposed effective term:

30. Planned enrollment per section: 15 per term: 15

31. Is the course cross-listed with another academic unit? 
   Yes [X] No

32. Is the course offered at more than one level? 
   Yes [X] No

33. If yes to either question, please list additional Alpha/Numeric codes, and 
    submit a separate New Course form or Course Modification form for the 
    course(s) referenced below.

34. Approval of other academic unit (signature)

35. Name and title

36. Courses to be offered at more than one level. If the requirements are different, justification must be provided.

37. Credit hours: Fixed: 3 or Variable: 
    to

38. Terms offered: Fall [X] Spring [X] Summer

39. Years offered: 
    Every Year Alternate Years

40. Are students permitted to register for more than one section during a term? 
    Yes [X] No

41. May the courses be repeated for credit? 
    Yes [X] No

42. Grade Only: 
    Normal Grading (A-F)
    Credit/No Credit

43. Graduation: 
    Undergraduate
    Passing Grade/No Credit (A-C, NC)
    Credit/No Credit
    Graduate
    Normal Grading (A-F)
    Passing Grade/No Credit (A-C, NC)
    Credit/No Credit

44. Administrative Use Only
    Code:
    Effective Date: 
    CIP Code: 
    Field:
    Program:
    Level:
Grade Only (A-F, PR, I) Audit only
Audit only No Grade

12. Prerequisites (must be taken before):
   a. CEN 6700
   b. 
   c. 
   Co-requisites (must be taken together):
   a. PIN (Permission From Instructor)
   b. PDP (Permission From Department)

13. If course is to replace an existing course(s) will be deleted, and when should that deletion occur?
   Course to be removed from inventory
   Final Term to be offered YYYY (i.e. see 2004 for Fall 06)

14. Catalog description (30 words maximum)
   Theory and practice of management technology applied to project management, engineering project development and major technological innovations to address new business needs and opportunities. Topics covered include schedule, budgets, performance, technology

15. Attach a copy of a complete outline of the major topics covered. (Providing a syllabus that includes this information is acceptable.)
   Syllabus: 
   Attachments 1 No Attachment
   Attachments 2 No Attachment

16. Where does this course fit in the University/College/Department curriculum? (Be specific by course level, if applicable). Indicate prospective demand.
   GNEN 6790 is an elective course in MSE program of study

17. If the proposed course is similar to another course in the College or University, please describe the difference and provide a rationale for the duplication. (If this course duplicates material covered in another course within your department or college or in another college, attach a letter of endorsement from the department chairperson indicating their support. Clearly the areas in which this course will differ).
   This course is applications based and, as such, does not duplicate another course.

18. If the course is intended to meet a University Undergraduate Core requirement, complete the following and submit a course syllabus using the template.
   Please explain how this course fulfills the general education guidelines. (Guidelines are available in Faculty Senate Website)

Course Approval:
Department Curriculum Authority: 
   Date
Department Chairperson: 
PATRICIA A. PEDRE
   Date
College Curriculum Authority: 
   Date
College Dean:
   Date
After college approval, submit the original signed form to the Faculty Senate (UAR 3320) for undergraduate-level courses; for graduate-level courses submit the original signed form to the Graduate School (UAR 3240). For undergraduate/graduate dual-level courses, submit the proposals to each office.

<table>
<thead>
<tr>
<th>Faculty Senate Undergrad. Curriculum Comm.:</th>
<th>Date</th>
<th>(mm/dd/yyyy)</th>
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<tbody>
<tr>
<td>Date</td>
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<tr>
<td>Faculty Senate Core Curriculum Comm.:</td>
<td>Date</td>
<td>(mm/dd/yyyy)</td>
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<td>Date</td>
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<td>Graduate Council:</td>
<td>Date</td>
<td>(mm/dd/yyyy)</td>
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<td>Date</td>
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<tr>
<td>Office of the Provost:</td>
<td>Date</td>
<td>(mm/dd/yyyy)</td>
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<tr>
<td>Registrar's Office:</td>
<td>Date</td>
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1. Instructor Contact, Course Structure, Communication

1.1. Instructor Contact

Dr. John P. Dismukes
Professor, Chemical and Environmental Engineering Department, College of Engineering
3064 Nitschke Hall, MS 305, The University of Toledo, Toledo, Ohio 43606-3390
419-530-8065 (W) or 419-283-8780 (Cell)
Email: johnpdismukes@gmail.com; John.Dismukes@utoledo.edu

1.2. GNEN6790 Course Structure

Prerequisite:
GNEN6700 (Management of Projects and Technological Innovation) or Instructor Permission

Delivery:
The course is available anytime, anywhere on The University of Toledo Distance Learning (DL) Site www.dl.utoledo.edu via the Blackboard BB9 Home Page, that posts all required course materials except textbooks (see 3.1 below). Students should access additional “electronic” and “written” materials available from the University of Toledo Carlson Library www.cl.utoledo.edu or other electronic sources.

Academic Guidelines:
The University of Toledo Honor Code for Students applies to all individual student assignments. However, communication with classmates is encouraged including outlines and final reports of the Accelerated Radical Innovation Project.

1.3. Communication

Student(s) and Instructor communicate with each other via BB9 internal Email and Discussion tools, and via external email, phone, and scheduled office meetings. This includes team based interactions between students in selecting, structuring, assessing and reporting results of Term Projects per the course assignments. All written materials will be submitted electronically in the form of MSWord, Powerpoint, or Adobe Acrobat PDF documents.

2. Course Overview, Objectives and Topics

2.1. Course Overview

Study of new innovation approaches to achieve 2X-10X improvement in creating breakthrough innovations required for 21st Century competitiveness, emphasizing real time information assessment, roadmapping and knowledge management of the innovation process.

2.2. Course Objectives

The goal of this course is to provide graduate students and practicing engineers and managers with the opportunity to contribute improvements to the methodology and application of information to assess, explore and achieve Accelerated Radical Innovation (ARD). To accomplish this we will teach each other through communication, debate, and team oriented analysis and assessment, focusing on a major Potential Radical Innovation of recent interest by industry, government and academia: Algae Generated Biofuels!

CHEE6790 Spring 2012 Syllabus
Recent national and international studies support the conclusion that innovation methodologies for cost reduction and incremental improvement of existing technologies that proved successful in the late 20th Century will no longer be effective — and may even be counterproductive for global competitiveness in today’s world. In the increasingly flat 21st Century environment characterized by exponential growth of connectivity of data, information, communication and analysis, technological innovation will be an even more important worldwide driver of industrial and societal competitiveness.

Building on a prerequisite Semester Course (GNEN6700: Management of Projects and Technological Innovation), this course first uses published literature to review the theory and practice of technological innovation and economic development at the beginning of the 21st Century. It then addresses the rationale and methodology for implementation of information accelerated radical innovation throughout the 21st Century. The student’s grade is determined by performance on 3 Graded Assignments [MidTerm Exam – 20 points, Final Exam – 20 Points, and An Assessment Report Exploring Acceleration of Algae Biofuels as a Potential Radical Innovation. Radical Team Assessment on Improvement of Information Accelerated Radical Innovation – 60 Points]. Reading material for the 3 Graded Assignments includes:


- Two Books (for reading as needed), available with purchase from www.amazon.com

- Published Innovation Articles and Reports via BB9 Home Icon:
  - OTA Chapters 1,2,3
  - Open/Horizontal vs Closed/Vertical Innovation
  - Radical Innovation Dynamics
  - Accelerated Radical Innovation
  - IT/Computer Innovation Impacts
  - Scenario Forecasting/Planning
  - Innovation Cluster Dynamics
  - Outsourcing/Offshoring

### 2.3 Course Graded Assignments

The course content reflected in topics covered are those summarized above in Sections 2.1 and 2.2. Graded item assignments covering these materials include:

- MidTerm Exam (Weeks 8-9) 20 points of Course Grade
- Final Exam (Week 16) 20 points of Course Grade
- Report on Potential For Algae Biofuel Radical Innovation
  - 2 Page Team Project Outline Report 15 points of Course Grade
  - 20 Page Team Project Final Report 45 points of Course Grade

### 3. Course Instructional Materials

### 3.1 Selected Reference Texts: Purchase from Amazon.com or equivalent vendor

1) Radical innovation imperative to address the inevitability of change

CHEE6790 Spring 2012 Syllabus


3.2 Additional Selected Published Articles By Radical Innovation Authors

Posted Publications Available via ICONS on GNEN6790 Home Page

- OTA Chapters 1, 2, 3
- Open/Horizontal vs Closed/Vertical Innovation
- Radical Innovation Dynamics
- Accelerated Radical Innovation
- IT/Computer Innovation
- Scenarios/Forecasting/Planning
- Innovation Cluster Dynamics
- Outsourcing/Offshoring (for consultation as needed)

4. Graded Assignments and Grading Scale

4.1 Graded Assignments

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
<th>Due</th>
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<tbody>
<tr>
<td>Course Instructional Materials in Item 3 and Student Welcome Letter</td>
<td>3 Graded</td>
<td>Weeks 1-17</td>
</tr>
<tr>
<td>Reference Textbooks (Item 3.1) and Publications (Item 3.2)</td>
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</tr>
<tr>
<td>MidTerm Exam (To Be Submitted Latest Week 9) Based on Reference Texts and Published Articles on Blackboard Page</td>
<td>20</td>
<td>Latest Week 9</td>
</tr>
<tr>
<td>Final Exam (To Be Submitted end of Week 15) Based on Reference Texts and Published Articles on WebCT</td>
<td>20</td>
<td>End Week 15</td>
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<tr>
<td>Algae Biofuel Potential Innovation Assessment Project Student Team Term Project Applying IARI Methodology</td>
<td>60</td>
<td>Week 6</td>
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<tr>
<td>2-Page Team Project Outline Report</td>
<td>15</td>
<td>Week 17</td>
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<tr>
<td>Final Report (nominal 20 pages with Abstract, Introduction, Assessment, Conclusions, References, Figures, Tables)</td>
<td>45</td>
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TOTAL 100

4.2 Grading Scale

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<tr>
<th>Grade</th>
<th>Points</th>
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<tr>
<td>A</td>
<td>100-90</td>
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<tr>
<td>A-</td>
<td>90-87</td>
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<tr>
<td>B+</td>
<td>86-85</td>
</tr>
<tr>
<td>B</td>
<td>84-80</td>
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<tr>
<td>B-</td>
<td>79-78</td>
</tr>
<tr>
<td>C</td>
<td>77-67</td>
</tr>
<tr>
<td>D</td>
<td>66-57</td>
</tr>
<tr>
<td>F</td>
<td>56-0</td>
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</tbody>
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### GNEN 6790 Spring 2012 Course Schedule

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Utilize Course Materials on Homepage</th>
<th>Welcome, Schedule/Syllabus, Content Icons</th>
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</thead>
<tbody>
<tr>
<td>Jan 10-16 To Week 4 Jan 31 - Feb 6</td>
<td>Use Email and Discussion Tools</td>
<td>Communicate With Instructor and Classmates</td>
</tr>
<tr>
<td></td>
<td>Purchase from Amazon.com and Review Special Reference Texts and OTA Reports as Needed</td>
<td>Andrew Grove, &quot;Only The Paranoid Survive&quot;</td>
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<tr>
<td></td>
<td>Understand the 3 graded assignments</td>
<td>Thomas L. Friedman, &quot;Hot, Flat and Crowded&quot;</td>
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<tr>
<td></td>
<td>Review Literature on Algae Biofuel (e.g. on Blackboard Homepage and via Literature Search) as a Potential Radical Innovation, and Submit 2-Page Report Outline to Instructor in Week 5</td>
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<tr>
<th>Week 5</th>
<th>Continue literature research on Algae Biofuel and communicate with classmates and instructor</th>
<th>Complete initial assessment of potential of Algae Biofuel as a radical innovation</th>
</tr>
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<tbody>
<tr>
<td>Feb 7-13 To Week 9 Mar 7-13</td>
<td>Review Innovation Readings Posted on Homepage and from Reference Texts</td>
<td>Week 5 – Prepare 2 Page Outline Project Report proposing an Algae Biofuel Radical Innovation, submit to Instructor and Classmates (15 points)</td>
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<tr>
<td></td>
<td>Review Mid Term Exam Questions and Prepare for Mid Term Exam</td>
<td>Week 8 – Submit Mid Term Exam (20 points)</td>
</tr>
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<thead>
<tr>
<th>Week 10</th>
<th>Continue Your Algae Biofuel Project Development, Using Literature Review and Exchange of Ideas with Classmates</th>
<th>Search literature for further information related to Algae Biofuel as a radical innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar 14-20 To Week 13 April 4-10</td>
<td>Exchange Team Project Report Drafts with Classmates and Instructor</td>
<td>Complete assessment of Algae Biofuel as a Radical Innovation, and submit Final 20 page Report by End of Week 16</td>
</tr>
<tr>
<td></td>
<td>Begin Final Exam Preparation</td>
<td>Review Articles Related to Final Exam Questions</td>
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<tr>
<th>Week 14</th>
<th>Upgrade Initial Report Drafts to 20 Page Final Report by end Week 16</th>
<th>Instructor grade Final Report Worth 45 Points of final grade</th>
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<tbody>
<tr>
<td>April 11-17 To Week 17 May 2-8</td>
<td>Submit Final Exam Answers via Blackboard by end of Week 16</td>
<td>Instructor grade Final Exam Worth 20 Points of final grade</td>
</tr>
</tbody>
</table>

| Week 18: End of Semester -- Posting of Final Grades May 11 | | |