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

**DEPARTMENT:** School of Chemical Engineering  
**EFFECTIVE SESSION:** Fall 2016

**PROPOSED:**
- New course with supporting documents
- Add existing course offered at another campus
- Expiration of a course
- Change in course number
- Change in course title
- Change in course credit/type

**EXISTING:**

<table>
<thead>
<tr>
<th>Subject Abbreviation</th>
<th>Subject Abbreviation</th>
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</thead>
<tbody>
<tr>
<td>CHE</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Number</th>
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<tbody>
<tr>
<td>44900</td>
<td></td>
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</tbody>
</table>

**Long Title:** Fundamental Process Design  
**Short Title:** Fund Process Design  
*Abbreviated title will be entered by the Office of the Registrar if utilized (50 CHARACTERS ONLY)*

**TERMS OFFERED:**
- Summer
- Fall
- Spring

**CAMPUS(ES) INVOLVED:**
- Calumet
- N. Central
- Con Ed
- Tech Statewide
- Ft. Wayne
- W. Lafayette
- Indianapolis

### CREDIT TYPE

<table>
<thead>
<tr>
<th>1. Fixed Credit: Cr. Hrs.</th>
<th>3</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>2. Variable Credit Range:</th>
</tr>
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<tbody>
<tr>
<td>Minimum Cr. Hrs:</td>
</tr>
<tr>
<td>(Check One)</td>
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</table>

- Yes
- No

<table>
<thead>
<tr>
<th>Maximum Cr. Hrs:</th>
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### COURSE ATTRIBUTES:

- Pass/Not Pass Only
- Satisfactory/Unsatisfactory Only
- Repeatable
- Maximum Repeatable Credit: |

<table>
<thead>
<tr>
<th>4. Credit by Examination</th>
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<table>
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<tr>
<th>5. Special Fees</th>
</tr>
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</table>

### Lecture Type

<table>
<thead>
<tr>
<th>Minutes Per Meeting</th>
<th>Meetings Per Week</th>
<th>Weeks Offered</th>
<th>% of Credit Allocated</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>50</td>
<td>16</td>
<td>100%</td>
</tr>
</tbody>
</table>

### Cross-Listed Courses

**COURSE DESCRIPTION (INCLUDE REQUIREMENTS/RESTRICTIONS):**

Prerequisite: CHE 378  
Corequisites: CHE 306, CHE 348  
For CHE students only.  
Use of process and product synthesis methods and concepts; detailed design of unit operation equipment, the economics of chemical plants, and flow sheet optimization methods.

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**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 Department Head**  
Date  
**North Central Chancellor**  
Date

**West Lafayette Department Head**  
Date  
**West Lafayette College/School Dean**  
Date  
**West Lafayette Registrar**  
Date

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**Office of the Registrar**  
12/11/07
DEPARTMENT: School of Chemical Engineering  EFFECTIVE SESSION: Fall 2010

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

PREREQUISITE: CHE 378 Corequisites: CHE 306, CHE 348 For CHE students only.
Use of process and product synthesis methods and concepts; detailed design of unit operation equipment, the economics of chemical plants, and flow sheet optimization methods.

OFFICE OF THE REGISTRAR
To: Faculty of the College of Engineering

From: Faculty of the School of Chemical Engineering

RE: New Design Course numbered CHE 449

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 449 Fundamental Process Design**
Sem 1, Class 3, cr. 3
Prerequisites: CHE 378
Corequisites: CHE 306, CHE 348

Use of process and product synthesis methods and concepts; detailed design of unit operation equipment, the economics of chemical plants and flow sheet optimization methods.

**Rationale:** In order to incorporate cost analysis information into the senior design course, as well as further expand the information taught in senior design, there will now be a two semester design course sequence with CHE 449 taught in the fall and CHE 450 still in the spring.

A. Varma, Head
School of Chemical Engineering

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

ECC Minutes #26
Date 5/19/08
Chairman ECC
Supporting Documentation – CHE 449

Level: Undergraduate

Course Instructors: Professors R. Agrawal, J. Pekny, G. Reklaitis, and V. Venkatasubramanian


Course Outline

<table>
<thead>
<tr>
<th>Week(s)</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1-3</td>
<td>Process and Product Synthesis methods, concepts and heuristics</td>
</tr>
<tr>
<td>4-5</td>
<td>Process synthesis incl. introduction to algorithmic methods</td>
</tr>
<tr>
<td>6-7</td>
<td>Design of major unit operation equipment</td>
</tr>
<tr>
<td>8-9</td>
<td>Cost accounting and capital cost estimation</td>
</tr>
<tr>
<td>10-11</td>
<td>Flow sheet optimization methods</td>
</tr>
<tr>
<td>12</td>
<td>Design of batch and continuous processes</td>
</tr>
<tr>
<td>13-14</td>
<td>ASPEN simulation methods</td>
</tr>
<tr>
<td>15</td>
<td>Review</td>
</tr>
</tbody>
</table>

Course Objectives: To understand process and product synthesis methods and concepts; detailed design of unit operation equipment, the economics of chemical plants and flow sheet optimization methods.

Course Outcomes (numbers in parentheses refer to related program educational objective)

1. Apply systematic strategies for synthesizing chemical process designs that involve conventional unit operations (1, 3).
2. Understand the difference between steady state and batch chemical processes and the implication on their design and operation (1, 3).
3. Know where and how to obtain information on industrial chemical processes, process operating parameters, equipment costs, cost of chemicals and materials, and associated safety and environmental hazards (6, 8, 9).
4. Understand the role of physical property estimates on process design and be able to use appropriate physical property estimation methods in unit operations design (1, 2, 3, 5).
5. Estimate the capital and operating cost of a process and to assess its profitability (1, 8).
6. Perform detailed hands-on work with tools that ultimately lead to the design of a chemical plant (1, 5).

Assessment of Course Outcomes: Each of the outcomes will be assessed by giving the students appropriate assignments and exams.