UNIVERSITY FACULTY SENATE FORMS

Academic Program Approval

This form is a routing document for the approval of new and revised academic programs. Proposing department should complete this form. Detailed instructions for the proposal should be followed. A checklist is available to assist in the preparation of a proposal. For more information, call the Faculty Senate Office at 831-2921.

Submitted by: Bert Diemer and Jim Michaels           phone number: 831-8648            831-0630
Department: Chemical & Biomolecular Engineering    email address rbdjr@udel.edu      michaeja@udel.edu
Date: October 1, 2015

Action: ADD – 4+1 BCHE/MEPT
(Example: add major/minor/concentration, delete major/minor/concentration, revise major/minor/concentration, academic unit name change, request for permanent status, policy change, etc.)

Effective term: 16F
(use format 04F, 05W)

Current degree: MEPT
(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed change leads to the degree of: 4+1 BCHE/MEPT
(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed name: 4+1 BCHE/MEPT
Proposed new name for revised or new major / minor / concentration / academic unit
(if applicable)

Revising or Deleting:

Undergraduate major / Concentration: BCHE
(Example: Applied Music – Instrumental degree BMAS)

Undergraduate minor:
(Example: African Studies, Business Administration, English, Leadership, etc.)

Graduate Program Policy statement change:
(Must attach your Graduate Program Policy Statement)

Graduate Program of Study: MEPT
(Example: Animal Science: MS Animal Science: PhD Economics: MA Economics: PHD)

Graduate minor / concentration:

Note: all graduate studies proposals must include an electronic copy of the Graduate Program Policy Document, either describing the new program or highlighting the changes made to the original policy document.

Attached
List new courses required for the new or revised curriculum. How do they support the overall program objectives of the major/minor/concentrations?
(Be aware that approval of the curriculum is dependent upon these courses successfully passing through the Course Challenge list. If there are no new courses enter “None”)

None

Supply support letter from the Library, Dean, and/or Department Chair if needed
(all new majors/minors will need a support letter from the appropriate administrator.)

Attached

Supply a resolution for all new majors/programs; name changes of colleges, departments, degrees; transfer of departments from one college to another; creation of new departments; requests for permanent status. See example of resolutions.

WHEREAS, the Department of Chemical & Biomolecular Engineering in the College of Engineering has offered a successful program for the BCHE and sponsored a new MEPT program (Master of Engineering in Particle Technology), and

WHEREAS, the Department of Chemical & Biomolecular Engineering does not have a 4+1 program, and,

WHEREAS, the Department of Chemical & Biomolecular Engineering has received inquiries over the last several years from individuals who are interested in a 4+1 program, and,

WHEREAS, there is present particle technology interest from students and IFPRI, and,

WHEREAS, there is a lack of graduate degree programs in particle technology, and,

WHEREAS, there is a lack of concentration in particle technology in undergraduate degrees, and,

WHEREAS, there is a lack of similar 4+1 programs in particle technology, and,

WHEREAS, the existing BCHE undergraduate program and MEPT graduate program already provides all of the courses and administrative framework for such a degree, and,

WHEREAS, the proposed 4+1 program contributes to the milestones on the University’s “path to prominence” to achieve excellence in professional education; be it therefore

RESOLVED, that the Faculty Senate recommends provisionally for five years the approval of the establishment of a new 4+1 BCHE/MEPT program.

Explain, when appropriate, how this new/revised curriculum supports the 5 goals of undergraduate education: http://www2.udel.edu/gened/

WHEREAS, through rigorous and intense coursework, homework assignments, quizzes, tests, industrial design projects, reports and a capstone industrial internship, the proposed 4+1 BCHE/MEPT program will help undergraduate students: read critically, analyze arguments and information, and engage in constructive ideation; communicate effectively in writing, orally and through creative expression; work collaboratively and independently within and across a variety of cultural contexts and a spectrum of differences; critically evaluate the ethical implications of what they say and do; and reason quantitatively, computationally and scientifically.
Identify other units affected by the proposed changes:
(This would include other departments/units whose courses are a required part of the proposed curriculum.
Attach permission from the affected units. If no other unit is affected, enter “None”)

None

Describe the rationale for the proposed program change(s):
(Explain your reasons for creating, revising, or deleting the curriculum or program.)

I. Rationale for Creation, Revision or Deletion
The Department of Chemical and Biomolecular Engineering is requesting to add a 4+1 program in Particle Technology to allow BCHE students to take up to 6 credits (2 courses) from the MEPT core courses and MEPT approved relative elective courses to be “dual-counted” towards their Bachelor’s and the Master’s degrees, if the student applies and is admitted to the MEPT program. The dual-counted courses must be taken as CHEG Electives for the undergraduate degree.

Background:
The Department of Chemical and Biomolecular Engineering does not have a 4+1 program. A background study was completed, and no US institutions offer a graduate degree in particle technology. There is UD student interest and an international industrial demand for particle technology expertise. The majority of products produced in the chemical, pharmaceutical, materials, consumer products and energy industries either include particles or are made through the agency of particles. Engineers who work in these industries will inevitably find themselves designing, scaling and troubleshooting processes or systems involving particles. Undergraduate engineering programs rarely address the unique issues introduced by the particle phase. While elements of powder processing may be introduced in chemical, mechanical or materials engineering curricula, no program provides a comprehensive background in the properties of granular systems or the design and analysis of particle products and processes.
The 4+1 program is intended for University of Delaware BCHE undergraduates who want to develop their expertise in particle technology for industrial application and, upon graduation, continue their Master in Engineering in Particle Technology, either full-time or part-time while working in industry.

Requirements:
- A program GPA of 3.25 or higher in STEM undergraduate coursework.
- An overall GPA of 3.0 or higher.
- The completion of 60 credit hours.
- Course prerequisites: completion of undergraduate program coursework, including engineering thermodynamics, calculus, differential equations, and linear algebra, and transport phenomena (fluid mechanics, heat and mass transport).
- Application to the 4+1 program (preferably) by July 1st before junior year.
- Admission to the program must be approved no later than fall of senior year by the Director(s) of Particle Technology.

Objective:
To prepare students to meet the processing industry expectations with respect to particle technology. It is anticipated that it will serve as a recruiting tool for the graduate program in Master of Engineering in Particle Technology.

II. Rationale and Demand
A. Institutional Factors
1. UD Mission Compatibility: Among the “milestones” mapped out in UD’s Path to Prominence were excellence in professional education and a global initiative that extends UD’s geographic reach. Through use of UDCapture and Sakai (and other media platforms), this 4+1 will be accessible to University of Delaware students while on campus during their undergraduate career and well beyond the Delaware region for completion of the MEPT graduate degree. To date, we have had students taking the core MEPT courses remotely from other areas of the country (more than one hour from campus).
2. Planning Process: Because the College of Engineering/Department of Chemical and Biomolecular Engineering recognized the gap in their graduate offerings, Dr. R. Bertram Diemer and Dr. James N. Michaels were hired to start and direct the Master of Engineering in Particle Technology.
Program. The national need for this program was affirmed by surveying current and past members of the International Fine Particle Research Institute (IFPRI), a global research consortium of major industrial practitioners of particle technology that includes companies like Merck & Co., DuPont, AbbVie, Procter and Gamble, Unilever, E.I. Lilly, Universal Oil Products, and DSM. IFPRI and its members are strong sponsors of the program and are a source of material for courses, visiting instructors, and industrial internships.

3. Impact on other UD Programs: Program course requirements are all CHEG courses.

4. Utilization of Existing Resources: No additional resources are required at this point, as all courses are existing or planned and UDCapture is existing on-campus.

B. Student Demand: This 4+1 program is designed for engineering undergraduates who plan to be working in the process industries and desire to expand their knowledge of particle technology engineering. We anticipate an ongoing enrollment of BCHE undergrads.

C. Transferability: All MEPT core or relevant approved elective courses are relevant to gainful employment in particle technology. MEPT courses are transferable into the MEPT graduate engineering degree program, so long as the student remains eligible to enroll for a 5th year in the MEPT graduate program.

D. Graduate and Professional Program Access: MEPT courses are accessible to distance learners and part-time students. Online courses are anticipated in the near future.

E. Demand & Employment Factors: As our initial research study pointed out, there are no US institutions offering graduate degrees in particle technology engineering or a certificate program. Only one institution, the University of Western Ontario, offers a master’s degree in particle technology and fluidization. Several international schools have strong particle technology research programs, including TU Delft, University of Birmingham, University of Leeds, University of Queensland, U Pretoria and TU Braunschweig but none offer a coherent degree or concentration in particle technology. All MEPT courses are relevant to gainful employment in particle technology.

F. Regional, State and National Factors: The process industry in US is flourishing, yet, despite the importance of particle processing and particle technology in industry, degree offerings in the field are limited, especially for post-baccalaureate students and practicing professionals. The 4+1 program can help fill the void.

G. Other Strengths: We already have anticipated collaborations with several corporations for our MEPT program. The addition of a 4+1 program will enhance our graduating BCHE engineers who would like to advance their careers, help meet their employers’ expectations for educational background in the particle processing industry and allow students to gain prospective faculty recommendations.

III. Enrollments, Admissions and Student Finances

Management and Advisor:
The 4+1 program will be managed and advised by the Director(s) of Particle Technology.

Admissions and Enrollment:
- The prospective student would normally apply to MEPT (preferably) before their Junior year, but is required to apply before the fall semester of their Senior year.
- The prospective student must have completed 60 credits towards their undergraduate degree with a minimum GPA of 3.25 in STEM courses and overall GPA of 3.0.
- Students must meet all of the requirements for admission to the MEPT program, however, students are not required to take the GRE to gain admission to the MEPT 4+1.
- Upon approval by the Director(s), the student will be admitted to the MEPT 4+1 program and permitted to enroll in MEPT graduate courses.
- The MEPT 4+1 may result in up to 6 credits (2 MEPT courses) dual-counted towards the Bachelor’s and Master’s Degrees.
- Beyond the dual-counted courses, one or more MEPT courses, which are not needed for an undergraduate degree, may be submitted for approval to the Director(s) of Particle Technology for a transfer of credit to the MEPT graduate transcript.
Student Finances:
- Financial support is not available to undergraduate students in the MEPT 4+1.
- A Departmental partial tuition scholarship may be available to students in the 5th year of the MEPT 4+1.

IV. Curriculum Specifics

Program Description: The courses will be taken for credit with standard grading (A, B, etc.). MEPT courses taken as an undergraduate are eligible for transfer into a graduate engineering degree program in the following circumstances:

- The student earns a grade of B- or better.
- The student maintains an overall GPA of 3.0 or higher.
- Up to two courses (6 credits) taken during an undergraduate status may be dual-counted on the Bachelor’s and Master’s Degree transcripts.
- One or more courses (3 or more credits) taken during an undergraduate status (and not needed for the Bachelor degree) may be transferred to the MEPT graduate transcript.

Professor R. Bertram Diemer, Jr., and James N. Michaels will serve as the Directors of the BCHE/MEPT 4+1 program. This 4+1 program will be offered by the University of Delaware’s Department of Chemical and Biomolecular Engineering and will be administered through the MEPT Program.

MEPT Core & Elective Courses eligible for 4+1: (The lists may be added to over time.)

<table>
<thead>
<tr>
<th>Core Course No.</th>
<th>Course Name</th>
<th>Credits</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEG670</td>
<td>Particle Rate Processes</td>
<td>3</td>
<td>Fall Course</td>
</tr>
<tr>
<td>CHEG671</td>
<td>Particle Transport</td>
<td>3</td>
<td>Fall Course</td>
</tr>
<tr>
<td>CHEG672</td>
<td>Mathematics of Particle Systems</td>
<td>3</td>
<td>Fall Course</td>
</tr>
<tr>
<td>CHEG673</td>
<td>Particle Properties and Characterization</td>
<td>3</td>
<td>Fall Course</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elective Course No.</th>
<th>Course Name</th>
<th>Credits</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEG600/MSEG630</td>
<td>Intro to Science &amp; Eng of Polymer Systems</td>
<td>3</td>
<td>Fall Course</td>
</tr>
<tr>
<td>CHEG604</td>
<td>Probability &amp; Statistic for Eng Problem Solving</td>
<td>3</td>
<td>Spring Course</td>
</tr>
<tr>
<td>CHEG615</td>
<td>Special Topics in Mixing</td>
<td>3</td>
<td>Spring Course</td>
</tr>
<tr>
<td>CHEG616/MSEG616</td>
<td>Chemistry &amp; Physics of Surfaces &amp; Interfaces</td>
<td>3</td>
<td>Spring Course</td>
</tr>
<tr>
<td>CHEG617</td>
<td>Colloid Science &amp; Eng</td>
<td>3</td>
<td>Spring Course</td>
</tr>
</tbody>
</table>

V. Resources Available

There are no special learning resources required to support this 4+1 program, other than the availability of UDCapture (or other media programs) and a learning management platform, both of which currently exist.

VI. Resources Required

Current resources (learning resources as well as faculty resources) are sufficient to support this 4+1 program.
VII. Implementation and Evaluation

In collaboration with the Department of Chemical and Biomolecular Engineering, and IFPRI and its members, the MEPT 4+1 program will be marketed broadly, both nationally and internationally. The program will be administered by the Director(s) of Particle Technology, including admission, enrollment and advisement. Upon completion of the graduate courses with a grade of B- or higher and an overall GPA of 3.0 or higher, students may submit a transfer of credit of their courses to their MEPT graduate transcript.

University course evaluations (which are part of the graduate and undergraduate curriculum in chemical engineering) will be reviewed by the Department of Chemical and Biomolecular Engineering. In addition, a follow-up survey will be conducted of those who complete the BCHE/MEPT 4+1 program in an effort to assess the usefulness of the information provided for those in the particle processing industries. That feedback will be provided to the Director(s) of Particle Technology.

Program Requirements:
(Show the new or revised curriculum as it should appear in the Course Catalog. If this is a revision, be sure to indicate the changes being made to the current curriculum and include a side-by-side comparison of the credit distribution before and after the proposed change.) See example of side by side.
## Chemical Engineering Curriculum for BCHE/MEPT 4+1 Program

### Fall Term

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGGG 101</td>
<td>Introduction to Engineering (FYE)</td>
<td>2</td>
</tr>
<tr>
<td>CHEM 111</td>
<td>General Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>MATH 242</td>
<td>Analytic Geometry &amp; Calculus B</td>
<td>4</td>
</tr>
<tr>
<td>CISC 106</td>
<td>General Comp Science for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110</td>
<td>Critical Reading &amp; Writing</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits: 15

### Spring Term

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEG 112</td>
<td>Intro to Chemical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 112</td>
<td>General Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>MATH 243</td>
<td>Analytic Geometry &amp; Calc C</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 207</td>
<td>Fundamentals of Physics I</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Breadth Requirement Elective 1</td>
<td></td>
</tr>
</tbody>
</table>

Total Credits: 17

### Second Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEG 231</td>
<td>Chemical Engineering Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 220</td>
<td>Quantitative Analysis</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 221</td>
<td>Quantitative Analysis Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 208</td>
<td>Fundamental of Physics II</td>
<td>4</td>
</tr>
<tr>
<td>MSEG 302</td>
<td>Materials Science for Engineers</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Breadth Requirement Elective 2</td>
<td></td>
</tr>
</tbody>
</table>

Total Credits: 15

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEG 325</td>
<td>Chemical Engineering Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>CHEG 304</td>
<td>Probability &amp; Statistics for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 444</td>
<td>Physical Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 445</td>
<td>Physical Chemistry Laboratory (a)</td>
<td>0/1</td>
</tr>
<tr>
<td>MATH 305</td>
<td>Applied Math for Chemical Engineering</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Breadth Requirement Elective 3</td>
<td></td>
</tr>
</tbody>
</table>

Total Credits: 17

### Third Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEG 332</td>
<td>Chemical Engineering Kinetics</td>
<td>3</td>
</tr>
<tr>
<td>CHEG 341</td>
<td>Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 331</td>
<td>Organic Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 333</td>
<td>Organic Chemistry Laboratory</td>
<td>1/2</td>
</tr>
<tr>
<td></td>
<td>Technical Elective 1</td>
<td></td>
</tr>
<tr>
<td>CHEG 672</td>
<td>CHEG Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits: 16/17

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHEG 342</td>
<td>Heat and Mass Transfer</td>
<td>3</td>
</tr>
<tr>
<td>CHEG 345</td>
<td>Chemical Engineering Laboratory I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 332</td>
<td>Organic Chemistry (b) or</td>
<td></td>
</tr>
<tr>
<td>CHEM 527</td>
<td>Introduction to Biochemistry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Technical Elective 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Breadth Requirement Elective 4</td>
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Total Credits: 3

### Fourth Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEG 431</td>
<td>Chemical Process Design I</td>
<td>3</td>
</tr>
<tr>
<td>CHEG 401</td>
<td>Chemical Process Dynamics &amp; Control</td>
<td>3</td>
</tr>
<tr>
<td>CHEG 445</td>
<td>Chemical Engineering Laboratory II</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Breadth Requirement Elective 5</td>
<td></td>
</tr>
<tr>
<td>CHEG 673</td>
<td>CHEG Elective 2 (c)</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits: 15

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEG 432</td>
<td>Chemical Process Design II (DLE)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Technical Elective 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CHEG Elective 3 (d)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Breadth Requirement Elective 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Technical Elective 4 or CHEG Elective 4</td>
<td></td>
</tr>
</tbody>
</table>

Total Credits: 15

### Notes

(a) If CHEM 333 is taken for two credits, CHEM 445 is not required.

(b) CHEM 332 or CHEM 527 may be taken. If CHEM 527 is not taken, the BISC requirement must be met using BISC 207 or another approved course.

(c) CHEG 670 or 671 may also be taken.

(d) If all undergraduate requirements are met, additional MEPT core or approved elective courses can be taken and a request for transfer of credit to the graduate program submitted.
ROUTING AND AUTHORIZATION: (Please do not remove supporting documentation.)

Department Chairperson ___________________________ Date 10/6/15

Dean of College ___________________________ Date 10/20/2015
(By signing above, the Dean confirms that the college policies and bylaws have been followed correctly during consideration of the request described in this form.
The approval actions that were taken at the college level were (check all that apply):
________ college faculty vote; ________ college curriculum approval; ________ college senate approval

Chairperson, College Curriculum Committee ___________________________ Date 10/20/15

Chairperson, Senate Com. on UG or GR Studies ___________________________ Date

Chairperson, Senate Coordinating Com. ___________________________ Date

Secretary, Faculty Senate ___________________________ Date

Date of Senate Resolution ___________________________ Date to be Effective

Registrar ___________________________ Program Code ___________________________ Date

Vice Provost for Academic Affairs & International Programs ___________________________ Date

Board of Trustee Notification ___________________________ Date

Revised 9/22/2015/khs
October 6, 2015

Professor Robert Opila  
President, Faculty Senate  
University of Delaware  
011E Hullihen Hall  
Newark, DE 19716

Dear Professor Opila and Members of the Faculty Senate:

I am delighted to write in strong support of the proposed Graduate Certificate in Particle Technology program, which will complement the MEPT program that the Faculty Senate approved nearly two years ago. The MEPT program is distinctive in providing a specialized education in an area that is still only sparsely covered in standard science and engineering curricula, and the process of preparing multiple courses in particle technology also serves to organize the knowledge in the field to a level of depth that has not previously been available. This is therefore the kind of innovative program that can provide visible leadership for the University, College and Department of Chemical and Biomolecular Engineering in a critical technical, industrial and educational field.

Although the MEPT program can be completed in one calendar year, it has become clear to us that there is a significant potential population of students who would benefit from a more abridged exposure to this very important area. One such population is our own undergraduates, while another is the large cohort of practitioners who would benefit from such continuing educational offerings. Our faculty have therefore voted in enthusiastic support of offering the Graduate Certificate in collaboration with Engineering Outreach to motivated part-time Engineering Outreach non-degree students, undergraduate BChE students, or students matriculated in other graduate programs.

Please do not hesitate to contact me if you require additional information. Thank you for your consideration.

Best regards,

[Signature]

Abraham M. Lennhoff  
Allan P. Colburn Professor and Chair

www.udel.edu
Masters of Engineering Degree in Particle Technology

Academic Program Approval

This form is a routing document for the approval of new and revised academic programs. Proposing department should complete this form. For more information, call the Faculty Senate Office at 831-2921.

Submitted by: Eric M. Furst  phone number 831-0102

Department: Chemical and Biomolecular Engineering  email address furst@udel.edu

Action: Request for new Masters of Engineering in Particle Technology (MEPT)

(Example: add major/minor/concentration, delete major/minor/concentration, revise major/minor/concentration, academic unit name change, request for permanent status, policy change, etc.)

Effective term: 14F

(use format 04F, 05W)

Current degree: N/A

(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed change leads to the degree of: MEng

(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed name: Masters of Engineering in Particle Technology (MEPT)

Proposed new name for revised or new major / minor / concentration / academic unit (if applicable)

Revising or Deleting:

Undergraduate major / Concentration:

(Example: Applied Music – Instrumental degree BMAS)

Undergraduate minor:

(Example: African Studies, Business Administration, English, Leadership, etc.)

Graduate Program Policy statement change:

(Must attach your Graduate Program Policy Statement)

Graduate Program of Study:

(Example: Animal Science: MS Animal Science: PHD Economics: MA Economics: PHD)

Graduate minor / concentration:

Note: all graduate studies proposals must include an electronic copy of the Graduate Program Policy Document, highlighting the changes made to the original policy document.
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(Be aware that approval of the curriculum is dependent upon these courses successfully passing through the Course Challenge list. If there are no new courses enter “None”)

CHEG670 – Rate Processes and Kinetics for Particle Systems
CHEG671 – Particle Transport in Fluids and Powders
CHEG672 – Mathematics for Particulate Systems
CHEG673 – Particle Characterization and Measurement
CHEG674 – Particle-Fluid and Particle-Particle Separation and Classification
CHEG675 – Particle-Based Product Engineering & Economics

Explain, when appropriate, how this new/revised curriculum supports the 10 goals of undergraduate education: http://www.ugs.udel.edu/gened/

N/A

Identify other units affected by the proposed changes:
(Attach permission from the affected units. If no other unit is affected, enter “None”)

None

Describe the rationale for the proposed program change(s):
(Explain your reasons for creating, revising, or deleting the curriculum or program.)

The Masters of Engineering program in Particle Technology will train talented science and engineering students in the principles of modern particle technology for careers in a broad range of industries, including chemicals, materials, nanotechnology and pharmaceuticals. Analysis of the employment market indicates a significant demand for training in particle technology, and the lack of competing programs suggests that this demand can be met by the unique opportunities afforded by the proposed UD program. The Masters of Engineering in Particle Technology provides Delaware with the important opportunity to define the core curriculum of particle technology and establish it as an academic discipline in the US, and realization of this opportunity will position UD as an international leader in particle technology. The breadth and rigor of the curriculum, together with the immersive industrial internship, will prepare the masters program graduates to pursue careers in industry, business, government agencies, and non-profit organizations.

Program Requirements:
(Show the new or revised curriculum as it should appear in the Course Catalog. If this is a revision, be sure to indicate the changes being made to the current curriculum and include a side-by-side comparison of the credit distribution before and after the proposed change.)
(see attached)

Routing and Authorization
(Please do not remove supporting documentation)

Department Chairperson: [Signature] Date: 9/23/13
Dean of College: [Signature] Date: 10/15/2013
Chairperson, College Curriculum Committee: [Signature] Date: 10/15/13

Chairperson, Senate Com. on UG or GR Studies: ___________________________ Date: ___________________________

Chairperson, Senate Coordinating Com: ___________________________ Date: ___________________________

Secretary, Faculty Senate: ___________________________ Date: ___________________________

Date of Senate Resolution: ___________________________ Date to be Effective: ___________________________

Registrar: ___________________________ Program Code: ___________________________ Date: ___________________________

Vice Provost for Academic Affairs & International Programs: ___________________________ Date: ___________________________

Provost: ___________________________ Date: ___________________________

Board of Trustee Notification: ___________________________ Date: ___________________________

Revised 10/23/2007 /khs