

PURDUE UNIVERSITY  
REQUEST FOR ADDITION, EXPIRATION,  
OR REVISION OF A GRADUATE COURSE  
(50000-60000 LEVEL)ABE 55700  
Graduate Council Doc. No.13-18a  
EFD 55-13

DEPARTMENT <u>Agricultural and Biological Engineering</u>		EFFECTIVE SESSION <u>Spring 2013</u>	<u>201420</u>
INSTRUCTIONS: Please check the items below which describe the purpose of this request.			
<input checked="" type="checkbox"/> 1. New course with supporting documents (complete proposal form)		<input type="checkbox"/> 7. Change in course attributes	
<input type="checkbox"/> 2. Add existing course offered at another campus		<input type="checkbox"/> 8. Change in instructional hours	
<input type="checkbox"/> 3. Expiration of a course		<input type="checkbox"/> 9. Change in course description	
<input type="checkbox"/> 4. Change in course number		<input type="checkbox"/> 10. Change in course requisites	
<input type="checkbox"/> 5. Change in course title		<input type="checkbox"/> 11. Change in semesters offered	
<input type="checkbox"/> 6. Change in course credit/type		<input type="checkbox"/> 12. Transfer from one department to another	
PROPOSED: Subject Abbreviation <u>ABE</u>		EXISTING: Subject Abbreviation _____	
Course Number <u>55700</u>		Course Number _____	
Long Title <u>Transport Operations in Food and Biological Systems II</u>		TERMS OFFERED Check All That Apply: <input checked="" type="checkbox"/> Fall <input type="checkbox"/> Spring <input type="checkbox"/> Summer	
Short Title <u>Transp Op Food &amp; Bio Sys II</u>		CAMPUS(ES) INVOLVED <input type="checkbox"/> Calumet <input type="checkbox"/> N. Central <input type="checkbox"/> Cont Ed <input type="checkbox"/> Tech Statewide <input type="checkbox"/> Ft. Wayne <input checked="" type="checkbox"/> W. Lafayette <input type="checkbox"/> Indianapolis	
Abbreviated title will be entered by the Office of the Registrar if omitted. (30 CHARACTERS ONLY)			
CREDIT TYPE 1. Fixed Credit: Cr. Hrs. <u>3</u>		COURSE ATTRIBUTES: Check All That Apply	
2. Variable Credit Range: Minimum Cr. Hrs. _____ (Check One) To <input type="checkbox"/> Or <input type="checkbox"/> Maximum Cr. Hrs. _____		1. Pass/Not Pass Only <input type="checkbox"/> 6. Registration Approval Type <input type="checkbox"/>	
3. Equivalent Credit: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		2. Satisfactory/Unsatisfactory Only <input type="checkbox"/> Department <input type="checkbox"/> Instructor <input type="checkbox"/>	
4. Thesis Credit: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		3. Repeatable <input type="checkbox"/> 7. Variable Title <input type="checkbox"/>	
5. Fees <input type="checkbox"/> Coop <input type="checkbox"/> Lab <input type="checkbox"/> Rate Request <input type="checkbox"/>		8. Honors <input type="checkbox"/>	
Include comment to explain fee _____		9. Full Time Privilege <input type="checkbox"/>	
		10. Off Campus Experience <input type="checkbox"/>	
Schedule Type		Cross-Listed Courses	
Lecture _____		RECEIVED	
Recitation _____		OCT 22 2013	
Presentation _____		OFFICE OF THE REGISTRAR	
Laboratory _____			
Lab Prep _____			
Studio _____			
Distance _____			
Clinic _____			
Experiential _____			
Research _____			
Ind. Study _____			
Pract/Observ _____			
COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS): Analysis and design of operations, such as dehydration, fermentation, and separation processes. Development of experimental designs. Integration of pilot plant results into the design, operation and scale-up process systems. Emphasis on how the properties of biological materials influence the quality of the processed product. Requisites, Restrictions, and Attributes: ABE 45700 Professor Okos.			
COURSE LEARNING OUTCOMES: Self learning/preparation for life long learning. A capacity to apply these principles to the development of typical industrial processes. Develop and conduct an experimental design to identify impact of process variables to improve product quality. An ability to communicate technical information effectively. Improved computer skills. A facility to work in teams. Meeting deadline. Evaluate ethical, global, and societal contemporary issues.			
Calumet Department Head _____ Date _____ Calumet School Dean _____ Date _____ Calumet Director of Graduate Studies _____ Date _____			
Fort Wayne Department Head _____ Date _____ Fort Wayne School Dean _____ Date _____ Fort Wayne Director of Graduate Studies _____ Date _____			
Indianapolis Department Head _____ Date _____ Indianapolis School Dean _____ Date _____ IUPUI Associate Dean for Graduate Education _____ Date _____			
North Central Department Head _____ Date _____ North Central School Dean <u>Shawn Donkin</u> _____ Date <u>6-13-13</u> North Central Director of Graduate Studies _____ Date _____			
West Lafayette Department Head _____ Date _____ West Lafayette College/School Dean _____ Date _____ APPROVED 10/17/13 Date Approved by Graduate Council _____			
Graduate Area Committee Convener _____ Date _____ Graduate Dean _____ Date _____ Graduate Council Secretary <u>Trina L. Payne</u> _____ Date <u>10/18/13</u>			
West Lafayette Registrar <u>Sandra K. Hoffer</u> _____ Date <u>10/30/13</u>			
OFFICE OF THE REGISTRAR			
(Grad Form 40G [Excel format] - Does not include the Graduate Council's required supporting document. See pdf version of Form 40G)			

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

EFD 55-13

DEPARTMENT Agricultural and Biological EngineeringEFFECTIVE SESSION Spring 2013

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

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> 1. New course with supporting documents | <input type="checkbox"/> 7. Change in course attributes (department head signature only)  |
| <input type="checkbox"/> 2. Add existing course offered at another campus   | <input type="checkbox"/> 8. Change in instructional hours                                 |
| <input type="checkbox"/> 3. Expiration of a course                          | <input type="checkbox"/> 9. Change in course description                                  |
| <input type="checkbox"/> 4. Change in course number                         | <input type="checkbox"/> 10. Change in course requisites/restrictions                     |
| <input type="checkbox"/> 5. Change in course title                          | <input type="checkbox"/> 11. Change in semesters offered (department head signature only) |
| <input type="checkbox"/> 6. Change in course credit/type                    | <input type="checkbox"/> 12. Transfer from one department to another                      |

## PROPOSED:

Subject Abbreviation

ABE

## EXISTING:

Subject Abbreviation

Course Number

55700

Course Number

Long Title

Transport Operations in Food and Biological Systems II

Short Title

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

## TERMS OFFERED

Check All That Apply:

☒ Fall ☐ Spring ☐ Summer

## CAMPUS(ES) INVOLVED

<input type="checkbox"/> Calumet	<input type="checkbox"/> N. Central
<input type="checkbox"/> Cont Ed	<input type="checkbox"/> Tech Statewide
<input type="checkbox"/> Ft. Wayne	<input checked="" type="checkbox"/> W. Lafayette
<input type="checkbox"/> Indianapolis	

## CREDIT TYPE

1. Fixed Credit: Cr. Hrs.

3

2. Variable Credit Range:

Minimum Cr. Hrs

To ☐Or ☐

(Check One)

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

Meetings Per

Week

Weeks

Offered

% of Credit

Allocated

Lecture

502

Recitation

Presentation

Laboratory

1102

Lab Prep

Studio

Distance

Clinic

Experiential

Research

Ind. Study

Pract/Observ

## Cross-Listed Courses

## COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

Analysis and design of operations, such as dehydration, fermentation, and separation processes. Development of experimental designs. Integration of pilot plant results into the design, operation and scale-up process systems. Emphasis on how the properties of biological materials influence the quality of the processed product.

Requisites, Restrictions, and Attributes: ABE 45700

## \*COURSE LEARNING OUTCOMES

Self learning/preparation for life long learning. A capacity to apply these principles to the development of typical industrial processes. Develop and conduct an experimental design to identify impact of process variables to improve product quality. An ability to communicate technical information effectively. Improved computer skills. A facility to work in teams. Meeting deadline. Evaluate ethical, global, and societal contemporary issues

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

West Lafayette Department Head

Date

West Lafayette College/School Dean

Date

West Lafayette Registrar

Date

OFFICE OF THE REGISTRAR

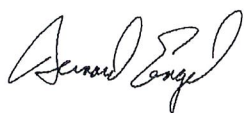
**TO:** The Faculty of the College of Engineering  
**FROM:** The Faculty of Agricultural and Biological Engineering  
**RE:** New Course ABE 55700

The faculty of the Department of Agricultural and Biological Engineering has approved the following new course. This action is now submitted to the Engineering Faculty with a recommendation for approval.

**ABE 55700** Transport Operations in Food and Biological Systems II  
Sem. 1, Class 2. Lab 4. Cr. 3.  
Requisites, Restrictions, and Attributes: ABE 45700

**Description:** Analysis and design of operations, such as dehydration, fermentation, and separation processes. Development of experimental designs. Integration of pilot plant results into the design, operation and scale-up process systems. Emphasis on how the properties of biological materials influence the quality of the processed product.

**Reason:** This course is replacing ABE 55500 (4 credits) with a 3 credit course with the most essential information from that course. The reduction in course content and credit hours will help the Department meet the 128 credit constraint for the Biological Engineering plan of study.

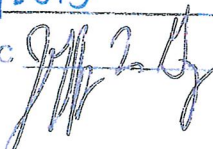


Bernard A. Engel, Professor and Head  
Agricultural and Biological Engineering Department

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

ECC Minutes # 13

Date 5/10/2013

Chairman ECC 

**ABE 55700 Transport Operations in Food and Biological Systems II****COURSE CONTACT INFORMATION:**

Name: Martin Okos  
 Phone Number: 494-1211  
 E-mail Address: okos@purdue.edu  
 Campus Address: NLSN 1169

**Course Description.** Analysis and design of operations, such as dehydration, fermentation, and separation processes. Development of experimental designs. Integration of pilot plant results into the design, operation and scale-up process systems. Emphasis on how the properties of biological materials influence the quality of the processed product.

Requisites, Restrictions, and Attributes: ABE 45700

**COLLEGE (AGRICULTURE) LEARNING OUTCOMES ADDRESSED BY THIS COURSE**

- \_\_\_\_\_ Professional Preparation: Demonstrate proficiency in their chosen discipline that incorporates knowledge skills, technology, and professional conduct.
- X   Scientific Principles: Demonstrate use of the scientific method to identify problems, formulate and test hypotheses, conduct experiments and analyze data, and derive conclusions.
- X   Critical Thinking: Demonstrate critical thinking by using data and reasoning to develop sound responses to complex problems.
- X   Communication: Demonstrate the ability to write and speak with effectiveness while considering audience and purpose.
- X   Teamwork: Demonstrate the ability to work effectively as part of a problem-solving team.
- \_\_\_\_\_ Cultural Understanding: Demonstrate knowledge of a range of cultures and an understanding of human values and points of view of other than their own.
- \_\_\_\_\_ Social Science Principles: Demonstrate ability to apply social, economic, political, and environmental principles to living in a global community.
- \_\_\_\_\_ Civic Responsibility: Demonstrate awareness of civic responsibility to community and society at large.
- X   Lifelong Learning: Demonstrate skills necessary for lifelong learning.

**DEPARTMENTAL/PROGRAM LEARNING OUTCOMES ADDRESSED BY THIS COURSE**

- X   an ability to apply knowledge of mathematics, science, and engineering
- X   ability to design and conduct experiments, as well as to analyze and interpret data.
- X   an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- X   an ability to function on multidisciplinary teams

- ☒ an ability to identify, formulate, and solve engineering problems
- ☐ an understanding of professional and ethical responsibility
- ☒ an ability to communicate effectively
- ☒ the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- ☒ a recognition of the need for, and an ability to engage in life-long learning
- ☒ a knowledge of contemporary issues
- ☒ an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

#### GRADUATE STUDENT LEARNING OUTCOMES ADDRESSED BY THIS COURSE

- ☒ Identify and conduct original research, scholarship and creative endeavors
- ☒ Effectively communicate their field of study
- ☒ Think critically, creatively and solve problems in their field of study
- ☐ Conduct research in an ethical and responsible manner
- ☒ Demonstrate attributes of professional development consistent with expectations within their field of study

#### Course outline of Topics/Syllabus

Drying (2 weeks)

Packaging (1 week)

Fermentation (2 weeks)

Membrane Separations (2 weeks)

Gas-Liquid Separations (2 weeks)

Vapor-Liquid Separations (2 weeks)

Liquid Solid Separations (2 weeks)

Physical Separations (1 week)

#### Reading List/Textbook

Geankoplis, Christie, 2003, Transport Processes and Separation Process Principles. 4th Edition, Prentice-Hall, Inc., Upper Saddle River, New Jersey.

Peters, M, K. Timmerhaus, R. West, 2003, Plant Design and Economics for Chemical Engineers. 5th Edition, McGraw Hill , NY, NY

Example syllabus

**ABE 55700 Transport Operations in Food and Biological Systems II**

**Textbook and/or other recommended material**

Geankoplis, C.J. 2003. "Transport Processes and Separation Process Principles," 4th Ed., Prentice Hall, Englewood Cliffs, NJ.

**Course Learning Objectives:**

The emphasis of the course is on overall process design and the integration of unit operation principles and design concepts addressed in ABE 454. More specifically, students are to come away from this course with:

An understanding of the principles and design/scale-up aspects of various unit operations and processes utilized by the biological and food process industries,

1. Self learning/preparation for life long learning
2. A capacity to apply these principles to the development of typical industrial processes,
3. Develop and conduct an experimental design to identify impact of process variables to improve product quality.
4. An ability to communicate technical information effectively,
5. Improved computer skills, and
6. A facility to work in teams.
7. Meeting deadline
8. Evaluate ethical, global, and societal contemporary issues

**Grading Procedure:**

GRADING POLICY: +/- A/B/C/D/F/I

Algorithm/Design Projects	25%
Term Project/ Lab/Design	25%
Exam:	25%
Homework	25%

**COURSE OUTLINE:**

Week	Lecture Topic	Reading	Lab/design	Due Dates
1	Drying	Geankoplis Ch. 9	Design of Experiment Project Mtg	
2	Drying	Geankoplis Ch. 9	Drying Process Design Exam	Homework
3	Drying & Packaging	Handout	Drying Process	Homework
4	Fermentation	Handout	Isotherm & Drying	Homework Design Phase 1 and 2
5	Fermentation		Semester Process Design	Homework Dryer Design Presentation
6	Membrane Separations	Geankoplis Ch. 13	Semester Project Mtg	Homework
7-8	Gas-Liquid Separations	Geankoplis Ch. 10	Exam	Homework Phase 3 and 4
9-10	Vapor-Liquid Separations	Geankoplis Ch. 11	Fermentation Design	Homework
11-12	Liquid Solid Separation	Geankoplis Ch. 12	Semester Project Mtg	Homework
13	Physical Separations	Geankoplis Ch. 14		Homework Phase 5 and 6
			Separation Design	
14			Laboratory Reports Oral presentation	Homework
15				Final Presentation Phase 7 and 8
Final Exam			Exam	Final Report