FORM 40 REV. 5/11

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

EFD 29-12

DEPARTMENT: Agricultural and Biological Engineering

EFFECTIVE SESSION: Spring

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

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

| PROPOSED: | | EXISTING: | |
|---|---|---|---|
| Subject Abbreviation | | Subject Abbreviation | ABE |
| Course Number | | Course Number | 21000 |
| Long Title | Thermodynamics Principles of Engineering and Biological Systems | | |
| Short Title | | | |

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

TERMS OFFERED
Check All That Apply:
- [ ] Summer
- [ ] Fall
- [x] Spring

CAMPUS(ES) INVOLVED
- [ ] Calumet
- [ ] Cont Ed
- [ ] Ft. Wayne
- [ ] Indianapolis
- [ ] N. Central
- [ ] Tech Statewide
- [x] W. Lafayette

CREDIT TYPE
1. Fixed Credit: Cr. Hrs.
2. Variable Credit Range:
   Minimum Cr. Hrs
   (Check One) To [ ] Or [ ]
   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. Fees [ ] Coop [ ] Lab [ ] Rate Request
   Include comment to explain fee
6. Registration Approval Type
   Department [ ] Instructor [ ]
7. Variable Title [ ]
8. Honors [ ]
9. Full Time Privilege [ ]
10. Off Campus Experience [ ]

| Schedule Type | Minutes Per Mtg | Meetings Per Week | Weeks Offered | % of Credit Allocated |
|---|---|---|---|---|
| Lecture | 50 | 3 | 16 | 100% |
| Recitation | | | | |
| Presentation | | | | |
| Laboratory | | | | |
| Lab Prep | | | | |
| Studio | | | | |
| Distance | | | | |
| Clinic | | | | |
| Experiential | | | | |
| Research | | | | |
| Ind. Study | | | | |
| Pract/Observ | | | | |

Cross-Listed Courses

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

Application of thermodynamic principles to the design and operation of biological and engineering systems. The focus is on mass and energy balances for non-reacting processes and on the second law of thermodynamics. These porinciples are applied to biological and agricultural engineering systems. specific topics include refrigeration systems, power cycles, energy conversion systems, and environmental impacts of energy production.

Prerequisites: CHM 11500 and PHYS 17200

*COURSE LEARNING OUTCOMES

An ability to apply knowledge of mathmatics, science, and engineering. An ability to design a system, component, or process to meet desired needs within realistic constraints such as econmomics, environmental, social, political, ethical, health and safety, manufacturability, and sustainabilty. An ability to function on multidisciplinary teams. An ability to identify, formulate, and solve engineering problems. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context. A knowledge of contempary issues. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

| | Date | | Date |
|---|---|---|---|
| Calumet Department Head | | Calumet School Dean | |
| Fort Wayne Department Head | | Fort Wayne School Dean | |
| Indianapolis Department Head | | Indianapolis School Dean | |
| North Central Faculty Senate Chair | | Vice Chancellor for Academic Affairs | |
| West Lafayette Department Head | 7/17/12 | West Lafayette College/School Dean | |

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:** Change to existing course ABE 21000 title and description

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

**From:** ABE 21000 Biological Applications of Material and Energy Balances
Sem. 2, Class 3, Cr. 3.
Prerequisites: CHM 11500 or equivalent and PHYS 17200 or equivalent.
Typically offered Spring.

Description: Applications of material energy balances to biological and engineering systems; development of a framework for the analysis of biological systems from an engineering perspective. Introduction to applications of the first and second laws of thermodynamics to biological and mechanical engineering systems. Topics include refrigeration systems, power cycles, energy conversion systems, and environmental impacts of energy production.

**To:** ABE 21000 Thermodynamic Principles of Engineering and Biological Systems
Sem. 2, Class 3, Cr. 3.
Prerequisites: CHM 11500 and PHYS 17200. Normally offered Spring.

Description: Application of thermodynamic principles to the design and operation of biological and engineering systems. The focus is on mass and energy balances for non-reacting processes and on the second law of thermodynamics. These principles are applied to biological and agricultural engineering systems. Specific topics include refrigeration systems, power cycles, energy conversion systems, and environmental impacts of energy production.

**Reason:** There are no major changes to the content of the course. The new title and description more accurately reflect the course content as it has been taught for the past several years. The former title and description led to misunderstandings regarding course content and objectives on the part of students. This change should reduce the likelihood of such misunderstandings.

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 _____
Date 7/30/2012
Chairman ECC R. Cipra