# Cover Sheet: Request 10661

### BME4XXX Biomolecular Thermodynamics and Kinetics

**Info**

| | |
|---|---|
| Process | Course\|New\|Ugrad/Pro |
| Status | Pending |
| Submitter | Theus, Kristin undergrad@bme.ufl.edu |
| Created | 1/4/2016 8:50:22 AM |
| Updated | 2/5/2016 7:20:37 AM |
| Description | Principles of thermodynamics and kinetics from a biomolecular perspective. The mathematics, analysis, and applications of classical thermodynamics, statistical thermodynamics, and reaction kinetics will be introduced in the context of molecular interactions, binding equilibria, metabolism, and biomolecular transport common to living systems. |

**Actions**

| Step | Status | Group | User | Comment | Updated |
|---|---|---|---|---|---|
| Department | Approved | ENG - Biomedical Engineering 021934001 | van Oostrom, Hans | | 1/4/2016 |
| No document changes | | | | | |
| College | Approved | ENG - College of Engineering | Caple, Elizabeth | | 1/21/2016 |
| No document changes | | | | | |
| University Curriculum Committee | Comment | PV - University Curriculum Committee (UCC) | Case, Brandon | Added to the February agenda | 1/22/2016 |
| No document changes | | | | | |
| University Curriculum Committee | Pending | PV - University Curriculum Committee (UCC) | | | 1/22/2016 |
| No document changes | | | | | |
| Statewide Course Numbering System | | | | | |
| No document changes | | | | | |
| Office of the Registrar | | | | | |
| No document changes | | | | | |
| Student Academic Support System | | | | | |
| No document changes | | | | | |
| Catalog | | | | | |
| No document changes | | | | | |
| College Notified | | | | | |
| No document changes | | | | | |

# Course|New for request 10661

## Info

**Request:** BME4XXX Biomolecular Thermodynamics and Kinetics
**Submitter:** Theus, Kristin undergrad@bme.ufl.edu
**Created:** 1/4/2016 8:50:22 AM
**Form version:** 1

## Responses

**Recommended Prefix:** BME
**Course Level :** 4
**Number :** XXX
**Lab Code :** None
**Course Title:** Biomolecular Thermodynamics and Kinetics
**Transcript Title:** BIO THERMO & KINETICS
**Effective Term :** Earliest Available
**Effective Year:** Earliest Available
**Rotating Topic?:** No
**Amount of Credit:** 3
**Repeatable Credit?:** No
**S/U Only?:** No
**Contact Type :** Regularly Scheduled
**Degree Type:** Baccalaureate
**Weekly Contact Hours :** 3
**Category of Instruction :** Advanced
**Delivery Method(s):** On-Campus
**Course Description :** Principles of thermodynamics and kinetics from a biomolecular perspective. The mathematics, analysis, and applications of classical thermodynamics, statistical thermodynamics, and reaction kinetics will be introduced in the context of molecular interactions, binding equilibria, metabolism, and biomolecular transport common to living systems.
**Prerequisites :** BME 3060 & BME 4311
**Co-requisites :** None.
**Rationale and Placement in Curriculum :** Replacing the college's EML 3007 thermodynamics course with this course which is more specific to biomedical engineering.
**Course Objectives :** • Develop basic knowledge of classical thermodynamics, equilibrium, and reaction kinetics.
• Develop an understanding of the application of statistical thermodynamics to biomolecule behavior and interactions.
• Develop a competence in the fundamental analytical and computational tools used to describe energy transformation within living systems.

**Course Textbook(s) and/or Other Assigned Reading:** Title: Biological Thermodynamics
Author: Haynie, Donald T.
Publication date and edition: 2008, 2rd edition; Cambridge
ISBN number: 978-0-5217-1134-0
**Weekly Schedule of Topics :** Week 1: Overview of energy transformation in living systems
Week 2: First law of thermodynamics
Week 3: Second law of thermodynamics
Week 4: Gibbs Free Energy – Theory I
Week 5: Gibbs Free Energy – Theory II
Week 6: Gibbs Free Energy – Applications I

Week 7: Gibbs Free Energy – Applications II; Exam 1
Week 8: Statistical Thermodynamics - Theory
Week 9: Statistical Thermodynamics - Application
Week 10: Binding Equilibria
Week 11: Cooperativity/Allostery
Week 12: Reaction kinetics - Theory
Week 13: Reaction kinetics – Modeling I
Week 14: Reaction kinetics – Modeling II
Week 15: Biology, complexity, and evolution; Exam 2

**Grading Scheme :** 35% Homework
20% Quizzes
20% Exam 1
25% Exam 2

A = 94 – 100
A- = 90 – 93.99
B+ = 87 – 89.99
B = 83 – 86.99
B- = 80 – 82.99
C+ = 77 – 79.99
C = 73 – 76.99
C- = 70 – 72.99
D = 61 – 69.99

**Instructor(s) :** To be determined.

UF UNIVERSITY of FLORIDA

# UCC: External Consultations

External Consultation Results (departments with potential overlap or interest in proposed course, if any)

| Department | Name and Title |
|---|---|
| Mechanical and Aerospace Eng | Bruce Carroll |
| **Phone Number** | **E-mail** |
| 352.392.4943 | bfc@ufl.edu |

Comments

Looks OK to me from MAE perspective. Does not overlap directly with any of our courses, although I could see some of our students being interested.

| Department | Name and Title |
|---|---|
| | |
| **Phone Number** | **E-mail** |
| | |

Comments

| Department | Name and Title |
|---|---|
| | |
| **Phone Number** | **E-mail** |
| | |

Comments