I. Call to Order

Roll

( ) Suzanne Forster UAB/CAS Humanities
( ) Sue Fallon UAB/CHSW Social Sciences
( ) Utpal Dutta UAB/SOE
( ) Kevin Keating UAB/Library
( ) Deborah Fox UAB/Mat-Su Written Communication
( ) Len Smiley CAS Quantitative Skills
( ) Shawnalee Whitney CAS Oral Communication
( ) Walter Olivares CAS Fine Arts
( ) Beverly Barker CAS Natural and Physical Sciences
( ) Robert Capuozzo COE
( ) Sandra Pence CTC
( ) Kyle Hampton CBPP Social Sciences
( ) Hilary Davies UAB Ex officio/UAB Chair
( ) Bart Quimby UAB Ex officio/OAA
( ) Vacant Student

II. Approval of Agenda (pg. 1)

III. Approval of Summary (pg. 2)

IV. Report from Associate Vice Provost Bart Quimby

V. Chair’s Report

VI. Course Action Requests

Chg PSY A370 Behavioral Neuroscience (3 cr) (3+0) (pg. 3-8)

Chg ENGL A311 Advanced Composition (3 cr) (3+0) (pg. 9-17)

Chg PHYS A123L Basic Physics I Laboratory (1 cr) (0+3) (pg. 18-22)

Chg PHYS A124L Basic Physics II Laboratory (1 cr) (0+3) (pg. 23-27)

Chg PHYS A211L General Physics I Laboratory (1 cr) (0+3) (pg. 28-32)

Chg PHYS A212L General Physics II Laboratory (1 cr) (0+3) (pg. 33-37)

Chg STAT A307 Probability and Statistics in Science (4 cr) (4+0) (pg. 38-42)

VII. Old Business
A. Discussion of Terry Rhodes presentation to GERC

B. GERC outcomes mapping

VIII. New Business
A. Assessment Committee response

IX. Informational Items and Adjournment
I. Call to Order
Roll
(e) Suzanne Forster UAB/CAS Humanities
(x) Sue Fallon UAB/CHSW Social Sciences
(x) Utpal Dutta UAB/SOE
(e) Kevin Keating UAB/Library
(x) Deborah Fox UAB/Mat-Su Written Communication
(x) Len Smiley CAS Quantitative Skills
(x) Shawnalee Whitney CAS Oral Communication
( ) Walter Olivares CAS Fine Arts
(x) Beverly Barker CAS Natural and Physical Sciences
(x) Robert Capuozzo COE
(x) Sandra Pence CTC
(e) Kyle Hampton CBPP Social Sciences
(x) Hilary Davies UAB Ex officio/UAB Chair
(x) Bart Quimby UAB Ex officio/OAA
( ) Vacant Student
A307

II. Approval of Agenda (pg. 1)
Approved

III. Approval of Summary (pg. 2)
Approved

IV. Report from Associate Vice Provost Bart Quimby

V. Chair’s Report
Suzanne Forster and Sue Fallon both attending AACU Conference

VI. Course Action Requests

Chg ENGL A311 Advanced Composition (3 cr) (3+0)
No revisions received

Chg PSY A370 Behavioral Neuroscience (3 cr) (3+0) (pg. )
1st reading, will see this course again at next GERC meeting

VII. Old Business
A. Discussion of Terry Rhodes presentation to GERC

B. GERC outcomes mapping (pg. 3-11)

VIII. New Business
A. Comments on the new Academic Assessment Handbook (pg. 12-31)

IX. Informational Items and Adjournment

Meeting adjourned
### Course Action Request

**University of Alaska Anchorage**

Proposal to Initiate, Add, Change, or Delete a Course

<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>1b. Division</th>
<th>1c. Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS CAS</td>
<td>ASSC Division of Social Science</td>
<td>Psychology</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Course Prefix</th>
<th>3. Course Number</th>
<th>4. Previous Course Prefix &amp; Number</th>
<th>5a. Credits/CEUs</th>
<th>5b. Contact Hours (Lecture + Lab)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSY</td>
<td>A370</td>
<td>N/A</td>
<td>3</td>
<td>(3+0)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. Complete Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral Neuroscience</td>
</tr>
</tbody>
</table>

Abbreviated Title for Transcript (30 character)

<table>
<thead>
<tr>
<th>7. Type of Course</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
<td>Preparatory/Development</td>
<td>Non-credit</td>
</tr>
</tbody>
</table>

| 8. Type of Action: | Add | Change |

If a change, mark appropriate boxes:

- Prefix
- Credits
- Title
- Grading Basis
- Course Description
- Test Score Prerequisites
- Other Restrictions
- Class
- Level
- College
- Major

<table>
<thead>
<tr>
<th>9. Repeat Status No</th>
<th># of Repeats</th>
<th>Max Credits</th>
</tr>
</thead>
</table>

| 10. Grading Basis | A-F | P/NP | NG |

<table>
<thead>
<tr>
<th>11. Implementation Date</th>
<th>semester/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>From: Fall/2011</td>
<td>To: 99/9999</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>12.</th>
<th>Cross Listed with</th>
</tr>
</thead>
</table>

- Stacked

| 13a. Impacted Courses or Programs: List any programs or college requirements that require this course. |

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at [www.uaa.alaska.edu/governance](http://www.uaa.alaska.edu/governance).

<table>
<thead>
<tr>
<th>Impacted Program/Course</th>
<th>Catalog Page(s) ! Impacted</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Tier 3: Integrative Capstone</td>
<td>83</td>
<td>2/19/10</td>
<td>uaa-faculty listserv</td>
</tr>
<tr>
<td>2. BIOL A452</td>
<td>334</td>
<td>1/11/10</td>
<td>Doug Causey</td>
</tr>
<tr>
<td>3. BA &amp; BS in Psychology; PSY A485</td>
<td>123; 459</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Initiator Name (typed): Gwen Lupfer-Johnson

Initiator Signed Initials: _________ Date:________________

<table>
<thead>
<tr>
<th>13b. Coordination Email</th>
<th>Date: 2/19/2010</th>
<th>13c. Coordination with Library Liaison</th>
<th>Date: 2/19/09</th>
</tr>
</thead>
<tbody>
<tr>
<td>submitted to Faculty Listserv: <a href="mailto:uaa-faculty@lists.uaa.alaska.edu">uaa-faculty@lists.uaa.alaska.edu</a></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>14. General Education Requirement</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Communication</td>
<td>Written Communication</td>
<td>Quantitative Skills</td>
</tr>
<tr>
<td>Fine Arts</td>
<td>Social Sciences</td>
<td>Natural Sciences</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>15. Course Description</th>
<th>(suggested length 20 to 50 words)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examines how behavior and cognition are mediated by biological processes. Covers neural activity, the organization of the nervous system, psychopharmacology, and biological bases of normal and abnormal behaviors. Special Note: Although this course is one option for a university-wide integrative capstone, it does not meet the Psychology major capstone requirement.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>16a. Course Prerequisite(s) (list prefix and number)</th>
<th>16b. Test Score(s)</th>
<th>16c. Co-requisite(s) (concurrent enrollment required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grades of C or higher in (ENGL A111), and either (PSY A111 or PSY A150), and either (BIOL A102; BIOL A111 or BIOL A115), and either (ENGL A211, ENGL A212, ENGL A213, or ENGL A214)</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>16d. Other Restriction(s)</th>
<th>16e. Registration Restriction(s) (non-codable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>College</td>
<td>Major</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>17.</th>
<th>Mark if course has fees</th>
</tr>
</thead>
</table>

| 18. | Mark if course is a selected topic course |

<table>
<thead>
<tr>
<th>19. Justification for Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Success in some upper-division courses in psychology hinges on mastery of material in key foundation courses (like PSY A111 or PSY A150), and basic skills in math and writing. Given the reliance on papers in this course, student success hinges on having proficiency in writing as covered in ENGL A111 and 200-level composition courses.</td>
</tr>
<tr>
<td>Initiator (faculty only)</td>
</tr>
<tr>
<td>--------------------------</td>
</tr>
<tr>
<td>Gwen Lupfer-Johnson</td>
</tr>
<tr>
<td>Initiator (TYPE NAME)</td>
</tr>
<tr>
<td>□ Approved</td>
</tr>
<tr>
<td>□ Disapproved</td>
</tr>
<tr>
<td>Department Chairperson</td>
</tr>
<tr>
<td>□ Approved</td>
</tr>
<tr>
<td>□ Disapproved</td>
</tr>
<tr>
<td>Curriculum Committee Chairperson</td>
</tr>
<tr>
<td>□ Approved</td>
</tr>
<tr>
<td>□ Disapproved</td>
</tr>
<tr>
<td>Dean/Director of School/College</td>
</tr>
<tr>
<td>□ Approved</td>
</tr>
<tr>
<td>□ Disapproved</td>
</tr>
<tr>
<td>Undergraduate/Graduate Academic Board Chairperson</td>
</tr>
<tr>
<td>□ Approved</td>
</tr>
<tr>
<td>□ Disapproved</td>
</tr>
<tr>
<td>Provost or Designee</td>
</tr>
<tr>
<td>□ Approved</td>
</tr>
<tr>
<td>□ Disapproved</td>
</tr>
</tbody>
</table>
I. **Initiation Date:** February 2010

II. **Course Information**
   A. **College:** College of Arts and Sciences
   B. **Course Title:** Behavioral Neuroscience
   C. **Course Subject/Number:** PSY A370
   D. **Credit Hours:** 3.0 Credits
   E. **Contact Time:**
      - Lecture hours: 3
      - Lab hours: 0
   F. **Grading Information:** A-F
   G. **Course Description:** Examines how behavior and cognition are mediated by biological processes. The course overviews neural activity, the organization of the nervous system, psychopharmacology, and biological bases of normal and abnormal behaviors.
      Special Note: Although this course is one option for a university-wide integrative capstone, it does not meet the Psychology major capstone requirement.
   H. **Status of course relative to degree or certificate program:** Applies to the BA and BS in Psychology
   I. **Lab Fees:** No
   J. **Coordination:** UAA faculty list-serve
   K. **Course Prerequisites:** Grades of C or higher in (ENGL A111), and either (PSY A111 or PSY A150), and either (BIOL A102; BIOL A111 or BIOL A115), and either (ENGL A211, ENGL A212, ENGL A213, or ENGL A214)
   L. **Registration Restrictions:** Junior or Senior standing.

III. **Course Activities**
    **Lecture**
    **Assignment:** Essay and multiple-choice exams; written assignments; anatomical diagrams.

IV. **Evaluation**
    Evaluation procedures are at the discretion of the instructor and will be discussed at the first class meeting of the semester. Students will be evaluated on closed-book quizzes/exams (approximately 70% of course grade), APA- or CSE-style term papers covering topics such as the ethical aspects of using non-human animals in behavioral research (approximately 20% of course grade), and miscellaneous brief exercises (e.g., a brain lab in which structures are identified by students working in groups; approximately 10% of course grade).
V. **Course Level Justification**
Before taking PSY A370 students must understand the basic principles of survey courses in both psychology and biology. Additionally, PSY A370 will explore a variety of issues that are also covered from different perspectives in other courses, making PSY A370 most appropriate for students who have amassed enough credits to be Juniors or Seniors.

VI. **Outline**
A. Origins of biological psychology
B. Structure and function of cells
C. Structure and function of nervous system
D. Psychopharmacology
   1. Principles of psychopharmacology
   2. Sites of drug action
   3. Neurotransmitters and neuromodulators
   4. Pharmacology of commonly abused drugs
E. Methods and strategies of research
   1. Brain lesion studies
   2. Recording and stimulating neural activity
   3. Neurochemical methods
F. Sensory systems
   1. Vision
   2. Audition and body senses
G. Sleep and biological rhythms
H. Reproductive behaviors
I. Neurological disorders
J. Ingestive behaviors
   1. Drinking
   2. Feeding
K. Learning and memory
L. Schizophrenia, anxiety, and affective disorders

VII. **Instructional Goals and Defined Outcomes**

<table>
<thead>
<tr>
<th>Instructor goals: The instructor will</th>
<th>Student Outcomes: Students will be able to</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Provide an overview of neural activity and the organization of the nervous system.</td>
<td>• Describe neural activity and the organization of the nervous system.</td>
</tr>
<tr>
<td>2. Explain the principles of psychopharmacology, including the mechanisms of action for common drugs of abuse and psychotropic medications.</td>
<td>• Explain the principles of psychopharmacology, including the mechanisms of action for common drugs of abuse and psychotropic medications.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>3.</td>
<td>Explain the neurobiological mechanisms to the expression of behaviors such as feeding, aggression, and reproduction.</td>
</tr>
<tr>
<td></td>
<td>• Describe the neurobiological mechanisms to the expression of behaviors such as feeding, aggression, and reproduction.</td>
</tr>
<tr>
<td>4.</td>
<td>Describe the physiological basis of psychopathology.</td>
</tr>
<tr>
<td></td>
<td>• Describe the physiological basis of psychopathology.</td>
</tr>
<tr>
<td>5.</td>
<td>Present the empirical basis for current developments in biological psychology by using primary sources.</td>
</tr>
<tr>
<td></td>
<td>• Relate quantitative results from empirical studies to brain mechanisms, behavior and cognition.</td>
</tr>
<tr>
<td>6.</td>
<td>Discuss ethical principles relevant to conducting behavioral neuroscience research with animals and humans.</td>
</tr>
<tr>
<td></td>
<td>• Apply bioethics as it relates to behavioral neuroscience research.</td>
</tr>
</tbody>
</table>

VIII. Integrative Capstone Justification

a. **Knowledge Integration**
   This is a core objective of the course. Findings from biology and neuroscience are related to the traditional interest areas of psychology, including learning, memory, psychopathology, drug abuse, and behavior regulation. In addition, topics from philosophy such as ethics, free will, and the mind-brain problem are frequently considered in the course.

b. **Effective Communication**
   The course requires written assignments and essay responses to exam questions. It is expected that there will typically be four written assignments, three of which will require the analysis of a research article. Students will be expected to submit clearly written assignments in either APA or CSE format.

c. **Critical Thinking**
   The written assignments will require the careful evaluation of empirical studies with attention to the appropriateness of the author’s conclusions. An examination of the connection between neuroscience data and psychological function is central to the course. Students will be asked to identify what is and is not shown by available research.

d. **Information Literacy**
   Students will use sources such as PsychInfo and CSA to identify recent research contributions relevant to the central topics in the course.

IX. **Suggested Text(s)**


X. Bibliography


## Course Action Request

**University of Alaska Anchorage**

Proposal to Initiate, Add, Change, or Delete a Course

<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>1b. Division</th>
<th>1c. Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS CAS</td>
<td>AHUM Division of Humanities</td>
<td>English</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Course Prefix</th>
<th>3. Course Number</th>
<th>4. Previous Course Prefix &amp; Number</th>
<th>5a. Credits/CEUs</th>
<th>5b. Contact Hours (Lecture + Lab)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL</td>
<td>A311</td>
<td>n/a</td>
<td>3 CR</td>
<td>(3+0)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. Complete Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Composition</td>
</tr>
</tbody>
</table>

**Abbreviated Title for Transcript (30 character)**

<table>
<thead>
<tr>
<th>7. Type of Course</th>
<th>8. Type of Action</th>
<th>9. Repeat Status No</th>
<th>10. Grading Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
<td>Add</td>
<td># of Repeats 0</td>
<td>A-F</td>
</tr>
<tr>
<td>Non-credit</td>
<td>Change</td>
<td></td>
<td>P/NP</td>
</tr>
<tr>
<td>CEU</td>
<td>Delete</td>
<td></td>
<td>NG</td>
</tr>
<tr>
<td>Professional Development</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>11. Implementation Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>From: Fall/2011</td>
</tr>
<tr>
<td>To: 9999/9999</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>12. Cross Listed with</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>13a. Impacted Courses or Programs:</th>
<th>13b. Coordination Email</th>
<th>13c. Coordination with Library Liaison</th>
</tr>
</thead>
<tbody>
<tr>
<td>List any programs or college requirements that require this course.</td>
<td>Date: 10/15/09</td>
<td>Date: 10/15/09</td>
</tr>
</tbody>
</table>

Initiator Name (typed): Jacqueline Cason

Initiator Signed Initials: [Signature] Date: [Date]

14. General Education Requirement

<table>
<thead>
<tr>
<th>Mark appropriate box:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Communication</td>
</tr>
<tr>
<td>Written Communication</td>
</tr>
<tr>
<td>Fine Arts</td>
</tr>
<tr>
<td>Social Sciences</td>
</tr>
<tr>
<td>Quantitative Skills</td>
</tr>
<tr>
<td>Humanities</td>
</tr>
<tr>
<td>Natural Sciences</td>
</tr>
<tr>
<td>Integrative Capstone</td>
</tr>
</tbody>
</table>

15. Course Description (suggested length 20 to 50 words)

Advanced instruction in composing and revising, with focus on invention strategies, and audience, persuasion, and style.

16a. Course Prerequisite(s) (list prefix and number) (ENGL A211 OR ENGL A212 OR ENGL A213 OR ENGL A214) with minimum grade of C

16b. Test Score(s) n/a

16c. Co-requisite(s) (concurrent enrollment required) n/a

16d. Other Restriction(s)

<table>
<thead>
<tr>
<th>Mark if course has fees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology</td>
</tr>
</tbody>
</table>

17. Mark if course is a selected topic course

18. Mark if course is a specified topic course

19. Justification for Action

Updating CCG for ENGL A311 to reflect current practices. Updating course description, outline, evaluation, goals and outcomes, and bibliography.

Initiator (faculty only) Jacqueline Cason

Initiator (TYPE NAME) [Signature] Date

Approved: [Signature] Date

Disapproved: [Signature] Date

Dean/Director of School/College [Signature] Date

Undergraduate/Graduate Academic [Signature] Date

Board Chairperson [Signature] Date

Provost or Designee [Signature] Date

Approved: [Signature] Date

Disapproved: [Signature] Date

Department Chairperson [Signature] Date

Approved: [Signature] Date

Disapproved: [Signature] Date

Curriculum Committee Chairperson [Signature] Date

Approved: [Signature] Date

Disapproved: [Signature] Date
<table>
<thead>
<tr>
<th>Impacted Program/Course</th>
<th>Catalog Page(s) Impacted</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA English</td>
<td>100-101</td>
<td>10/10/09</td>
<td>Judith Moore, Chair, Department of English</td>
</tr>
<tr>
<td>Minor, Professional Writing</td>
<td>101-102</td>
<td>10/10/09</td>
<td>Judith Moore, Chair, Department of English</td>
</tr>
<tr>
<td>Paralegal Studies</td>
<td>152-153 and 256</td>
<td>11-1-10</td>
<td>Andre Rosay, Director, Justice Center</td>
</tr>
<tr>
<td>Bachelor of Social Work</td>
<td>160</td>
<td>11-1-10</td>
<td>Beth Sirles, Director, School of Social Work</td>
</tr>
<tr>
<td>Bachelor of Arts, Languages</td>
<td>110-111</td>
<td>11-1-10</td>
<td>Judith Moore, Chair, Languages</td>
</tr>
</tbody>
</table>
Course Content Guide  
University of Alaska Anchorage  
College of Arts and Sciences  
Department of English  

I. Initiation Date: November, 2010  

II. Course Information  

A. College: College of Arts and Sciences  
B. Course Title: Advanced Composition  
C. Course Number: ENGL A311  
D. Credit Hours: 3.0 Credits  
E. Contact Time: 3 hours per week  
F. Grading Information: A-F  
G. Course Description: Advanced instruction in composing and revising, with focus on inventional strategies, and audience, persuasion, and style.  
H. Status of Course: The course fulfills a requirement for BA in English and English Minor, Professional Writing.  
I. Lab Fees: Technology fee  
J. Coordination: UAA Faculty Listserv  
K. Prerequisites: [ENGL A211 or ENGL A212 or ENGL A213 or ENGL A214] with min. grade of C  
L. Registration Restrictions: N/A  

III. Course Level Justification  

IV. An upper division designation is appropriate for a course that requires students to understand the relationship between classical rhetoric and contemporary composing, and that requires students to establish their rhetorical situation more independently,
V. Instructional Goals and Defined Outcomes

<table>
<thead>
<tr>
<th>Instructional Goals</th>
<th>Student Outcomes</th>
<th>Assessment Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture, lead discussion, and demonstrate the differences between ancient and modern rhetorics</td>
<td>Analyze the differences between ancient and modern rhetorics</td>
<td>Prompted discussion board postings Progymnastic exercises</td>
</tr>
<tr>
<td>Explain and demonstrate invention methods and guide students individually through written commentary on papers</td>
<td>Practice invention methods and use them to generate written papers</td>
<td>Prompted discussion board postings Invention assignments</td>
</tr>
<tr>
<td>Explain and demonstrate arrangement patterns in a rhetorical context and guide students individually through written commentary on papers</td>
<td>Analyze the relationship of arrangement to the rhetorical situation and implement appropriate arrangement choices in their writing</td>
<td>Papers and revisions</td>
</tr>
<tr>
<td>Explain and demonstrate style principles and guide students individually through written commentary on papers</td>
<td>Practice style principles and incorporate them into their writing</td>
<td>Papers and revisions Style portfolio</td>
</tr>
</tbody>
</table>

VI. Topical Course Outline

A. Writing as social interaction
   1. Theories of language: language as representative vs. language as social construction
   2. Ideology and commonplaces
   3. Rhetorical reading strategies

B. Ancient and modern rhetorics
   1. Ancient attitudes toward rhetoric
   2. Differences between modern and ancient rhetorics

C. Invention
   1. Kairos
   2. Stasis theory
   3. The commonplaces
   4. Ethical proof (ethos)
   5. Pathetic proof (pathos)
   6. Extrinsic proof (logos)

D. Arrangement
   1. Ancient teaching about arrangement
      a) The exordium
      b) The narrative
      c) The partition
      d) The arguments from confirmation and refutation
      e) The peroration
   2. The formal topics
      a) Definition
b) Division
c) Classification
d) Similarity (Comparison)

E. Style
1. Correctness and choices
2. Appropriateness: kairos and style
3. Clarity (character, action, topic, stress)
4. Grace (conciseness, shape, elegance)
5. Coherence
6. Ornament
7. Imitation and progymnasta

F. Memory
1. Memory and kairos
2. Ancient memory systems
3. Modern versions of ancient memory systems
4. Electronic memory systems

VII. Suggested Texts


VIII. Bibliography


<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>1b. Division</th>
<th>1c. Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS CAS</td>
<td>AMSC Division of Math Science</td>
<td>Physics</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Course Prefix</th>
<th>3. Course Number</th>
<th>4. Previous Course Prefix &amp; Number</th>
<th>5a. Credits/CEUs</th>
<th>5b. Contact Hours (Lecture + Lab)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS</td>
<td>A123L</td>
<td>NA</td>
<td>1</td>
<td>(0+3)</td>
</tr>
</tbody>
</table>

6. Complete Course Title
Basic Physics Laboratory

Abbreviated Title for Transcript (30 character)

7. Type of Course
☑ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☑ Add ☐ Change ☐ Delete

If a change, mark appropriate boxes:
- ☑ Prefix
- ☑ Course Number
- ☑ Credits
- ☑ Title
- ☑ Contact Hours
- ☑ Repeat Status
- ☑ Grading Basis
- ☑ Cross-Listed/Stacked
- ☑ Course Description
- ☑ Course Prerequisites
- ☑ Test Score Prerequisites
- ☑ Co-requisites
- ☑ Registration Restrictions
- ☑ Class
- ☑ Level
- ☑ College
- ☑ Major
- ☑ Other CCG (please specify)

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☑ A-F ☐ P/NP ☐ NG

11. Implementation Date
From: Fall/2011 To: /9999

12. ☑ Cross Listed with NA ☐ Stacked with NA

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

<table>
<thead>
<tr>
<th>Impacted Program/Course</th>
<th>Catalog Page(s) Impacted</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Initiator Name (typed): J. Pantaleone
Initiator Signed Initials: ___________
Date: ___________

13b. Coordination Email
Date: 10-15-10
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison
Date: 10-15-10

14. General Education Requirement
Mark appropriate box:
- ☑ Oral Communication
- ☑ Written Communication
- ☑ Quantitative Skills
- ☑ Social Sciences
- ☑ Natural Sciences
- ☑ Integrative Capstone

15. Course Description (suggested length 20 to 50 words)
Introductory physics laboratory with experiments in mechanics, fluids and thermodynamics using computerized data collection and analysis. Special Note: Requires hands-on use of instruments and performance of experiments in a college or university physics laboratory.

16a. Course Prerequisite(s) (list prefix and number)
[MATH A105 or any course for which MATH A105 is in the prerequisite chain] and [PHYS A123 with a minimum grade of C or concurrent enrollment].

16b. Test Score(s)
NA

16c. Co-requisite(s) (concurrent enrollment required)
NA

16d. Other Restriction(s)
☐ College ☑ Major ☐ Class ☐ Level

16e. Registration Restriction(s) (non-codable)
If the equivalent of PHYS 123 is taken from another institution, it must be completed prior to taking PHYS A123L

17. ☑ Mark if course has fees

18. ☑ Mark if course is a selected topic course

19. Justification for Action
To clarify expectations for a physics lab course.

Initiator (faculty only) Date
Initiator (TYPE NAME) Date

Approved ☑ Disapproved ☐ Dean/Director of School/College Date

Approved ☑ Disapproved ☐ Undergraduate/Graduate Academic Date

Approved ☑ Disapproved ☐ Board Chairperson Date

Approved ☑ Disapproved ☐ Provost or Designee Date
13a. Impacted Courses or Programs

<table>
<thead>
<tr>
<th>Impacted Program/Courses</th>
<th>Catalog Page(s) Impacted</th>
<th>Date of Coord.</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological, BA &amp; BS</td>
<td>94</td>
<td>10/15/2010</td>
<td>Bio Chair, Causey</td>
</tr>
<tr>
<td>Natural Sciences, BS</td>
<td>117</td>
<td>10/15/2010</td>
<td>Natural Science Chairs:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bio Chair, Causey</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/15/2010</td>
<td>Geol Chair, Munk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/15/2010</td>
<td>Chem Chair, Holmberg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/15/2010</td>
<td>Physics Chair, Pantaleone</td>
</tr>
<tr>
<td>Aviation, AS and BS</td>
<td>176&amp;177</td>
<td>10/15/2010</td>
<td>Aviation Dir, Capozzi</td>
</tr>
<tr>
<td>Geomatics, AS&amp;BS</td>
<td>231</td>
<td>10/15/2010</td>
<td>Geo Chair, Davis</td>
</tr>
<tr>
<td>PHYS 124L</td>
<td>452</td>
<td>10/15/2010</td>
<td>Physics Chair, Pantaleone</td>
</tr>
<tr>
<td>CM 331</td>
<td>352</td>
<td>10/15/2010</td>
<td>CM Chair, Ketner</td>
</tr>
<tr>
<td>CAS BS</td>
<td>85</td>
<td>10/15/2010</td>
<td>Anth Chair, Hanson</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/15/2010</td>
<td>Bio Chair, Causey</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/15/2010</td>
<td>CS Chair, Thiru</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/15/2010</td>
<td>Geol Chair, Munk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/15/2010</td>
<td>Math Chair, Thiru</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/15/2010</td>
<td>Psych Chair, Rosich</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/15/2010</td>
<td>Soc Chair, Riley</td>
</tr>
<tr>
<td>UAA Branch Campuses</td>
<td></td>
<td>10/15/2010</td>
<td></td>
</tr>
<tr>
<td>Kenai</td>
<td>10/15/2010</td>
<td>Dir. Turner</td>
<td></td>
</tr>
<tr>
<td>Kodiak</td>
<td>10/15/2010</td>
<td>Dir. Bolson</td>
<td></td>
</tr>
<tr>
<td>Mat-Su</td>
<td>10/15/2010</td>
<td>Dir. Clark</td>
<td></td>
</tr>
</tbody>
</table>
COURSE CONTENT GUIDE

I. Date of Initiation: October 15, 2010

II. Course Information

1. College: CAS
2. Course Subject: PHYS
3. Course Number: A123L
4. Number of Credits: 1
5. Number of Contact Hours: 0+3
6. Course Title: Basic Physics I Laboratory
7. Grading Basis: A-F
8. Course Description:
   Introductory physics laboratory with experiments in mechanics, fluids and thermodynamics using computerized data collection and analysis. Special Note: Requires hands-on use of instruments and performance of experiments in a college or university physics laboratory.

9. Course Prerequisite:

   [MATH A105 or any course for which MATH A105 is in the prerequisite chain] and [PHYS A123 with a minimum grade of C or concurrent enrollment].

III. Instructional Goals and Student Outcomes

1. Instructional Goals

   1. To help students understand the basis of knowledge in physics. Instructor will guide students to distinguish between inferences based on theory and on the outcomes of experiments.
   2. To reinforce the concepts covered in the PHYS A123 lecture.
   3. To provide students with measurement techniques and other experimental skills useful in the study of physical phenomena. The tools to be used include rulers, micrometers, sonic range finders, force sensors, video analysis and computerized data collection equipment. The instructor will provide hands-on supervision of the student's use of these tools in a laboratory setting.
   4. To provide the student with data analysis techniques using computers. These include graphing, curve fitting, modeling and statistical analysis. The instructor will provide hands-on supervision of the student's use of these methods in a laboratory setting.
5. To provide the student with an appreciation of uncertainties in measured quantities and uncertainty analysis techniques.
6. To help students develop collaborative learning skills in the investigation of physical phenomena. The instructor will provide hands-on supervision and guidance to students working in small groups in a laboratory setting.
7. To provide opportunities for students to gain familiarity and experience with the equipment and procedures of a college level physics laboratory.

2. Student Outcomes and Assessment Measures

The students in this physics lab course will be able to

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>design and conduct experiments and draw inferences from their observations.</td>
<td>Weekly lab reports.</td>
</tr>
<tr>
<td>demonstrate competency applying Newton's laws to physical situations.</td>
<td>Weekly lab reports, midterm and final exams.</td>
</tr>
<tr>
<td>demonstrate hands-on competency in using measuring devices.</td>
<td>Performance in a laboratory setting.</td>
</tr>
<tr>
<td>demonstrate hands-on competency in using computers to analyze data.</td>
<td>Performance in a laboratory setting.</td>
</tr>
<tr>
<td>estimate the uncertainty in all physical measurements and will propagate this uncertainty to their final, calculated results.</td>
<td>Weekly lab reports and exams.</td>
</tr>
<tr>
<td>collaborate in small groups to set up equipment, take measurements and analyze data.</td>
<td>Performance in a laboratory setting.</td>
</tr>
<tr>
<td>describe the equipment and safety procedures of a college level physics laboratory.</td>
<td>Demonstrated compliance with laboratory safety procedures and correct operation of equipment under the direction of physics laboratory personnel.</td>
</tr>
</tbody>
</table>

IV. Topical Course Outline

Here is a list of experiments typically performed in the course.

1. Method of Least Squares
2. Vector Addition
3. Straight Line Motion at Constant Speed
4. Uniformly Accelerated Motion
5. Atwood Machine with Newton's Second Law
6. Atwood Machine with Conservation of Energy
7. Kinetic Energy - Work Theorem
8. Collisions
9. Ballistic Pendulum
10. Static Equilibrium
11. Archimedes Principle
12. Thermal Coefficient of Linear Expansion
13. Mechanical Equivalent of Heat

V. Suggested Text


VI. Bibliography


Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College  
AS CAS

1b. Division  
AMSC Division of Math Science

1c. Department  
Physics

2. Course Prefix  
PHYS

3. Course Number  
A124L

4. Previous Course Prefix & Number  
NA

5a. Credits/CEUs  
1

5b. Contact Hours  
(Lecture + Lab) (0+3)

6. Complete Course Title  
Basic Physics II Laboratory

7. Type of Course
   - Academic
   - Preparatory/Development
   - Non-credit
   - CEU
   - Professional Development

8. Type of Action:
   - Add
   - Change
   - Delete

   If a change, mark appropriate boxes:
   - Prefix
   - Credits
   - Title
   - Grading Basis
   - Course Description
   - Test Score Prerequisites
   - Other Restrictions
   - Class Level
   - College Major
   - Other CCG (please specify)

9. Repeat Status No  
# of Repeats  
Max Credits

10. Grading Basis
   - A-F
   - P/NP
   - NG

11. Implementation Date
   - semester/year
   - From: Fall/2011
   - To: 9999

12. Cross Listed with  
   - NA

13. Coordination with Library Liaison
   - Date: 10-15-10

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

13b. Coordination Email
   - Date: 10-15-10
   - Submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison
   - Date: 10-15-10

14. General Education Requirement
   - Mark appropriate box:
     - Oral Communication
     - Written Communication
     - Quantitative Skills
     - Social Sciences
     - Natural Sciences
     - Integrative Capstone

15. Course Description
    (suggested length 20 to 50 words)
    Introductory physics laboratory with experiments in electric and magnetic fields, circuits, waves and light using computerized data collection and analysis. Special Note: Requires hands-on use of instruments and performance of experiments in a college or university laboratory.

16a. Course Prerequisite(s) (list prefix and number)
     [PHYS A123 and PHYS A123L] with minimum grades of C and [PHYS A124 with a minimum grade of C or concurrent enrollment].

16b. Test Score(s)
     - NA

16c. Co-requisite(s) (concurrent enrollment required)
     - NA

16d. Other Restriction(s)
     - College
     - Major
     - Class Level

16e. Registration Restriction(s) (non-codable)
     - If the equivalent of PHYS A124 is taken from another institution, it must be completed prior to taking PHYS A124L

17. Mark if course has fees

18. Mark if course is a selected topic course

19. Justification for Action
    To clarify expectations for a physics lab course.

Initiator (faculty only)
Date

Initiator (TYPE NAME)

Approved
Disapproved

Dean/Director of School/College
Date

Undergraduate/Graduate Academic
Date

Board Chairperson

Provost or Designee
Date
## 13a. Impacted Courses or Programs

<table>
<thead>
<tr>
<th>Impacted Program/Courses</th>
<th>Catalog Page(s) Impacted</th>
<th>Date of Coord.</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological, BA &amp; BS</td>
<td>94</td>
<td>10/15/2010</td>
<td>Bio Chair, Causey</td>
</tr>
<tr>
<td>Natural Sciences, BS</td>
<td>118</td>
<td>10/15/2010</td>
<td>Natural Science Chairs:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bio Chair, Causey</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Geol Chair, Munk</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Chem Chair, Holmberg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Physics Chair, Pantaleone</td>
</tr>
<tr>
<td>Geomatics, AS&amp;BS</td>
<td>231</td>
<td>10/15/2010</td>
<td>GEO Chair, Davis</td>
</tr>
<tr>
<td>CAS BS</td>
<td>85</td>
<td>10/15/2010</td>
<td>Anth Chair, Hanson</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bio Chair, Causey</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CS Chair, Thiru</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Geol Chair, Munk</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Math Chair, Thiru</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Psych Chair, Rosich</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Soc Chair, Riley</td>
</tr>
<tr>
<td>UAA Branch Campuses</td>
<td></td>
<td>10/15/2010</td>
<td></td>
</tr>
<tr>
<td>Kenai</td>
<td></td>
<td>10/15/2010</td>
<td>Dir. Turner</td>
</tr>
<tr>
<td>Kodiak</td>
<td></td>
<td>10/15/2010</td>
<td>Dir. Bolson</td>
</tr>
<tr>
<td>Mat-Su</td>
<td></td>
<td>10/15/2010</td>
<td>Dir. Clark</td>
</tr>
</tbody>
</table>
I. Date of Initiation: October 15, 2010

II. Course Information

1. College: CAS
2. Course Subject: PHYS
3. Course Number: A124L
4. Number of Credits: 1
5. Number of Contact Hours: 0+3
6. Course Title: Basic Physics II Laboratory
7. Grading Basis: A-F
8. Course Description:
   Introductory physics laboratory with experiments in electric and magnetic fields, circuits, waves and light using computerized data collection and analysis. Special Note: Requires hands-on use of instruments and performance of experiments in a college or university laboratory.

9. Course Prerequisite:
   [PHYS A123 and PHYS A123L] with minimum grades of C and [PHYS A124 with a minimum grade of C or concurrent enrollment].

III. Instructional Goals and Student Outcomes

1. Instructional Goals

   1. To help students understand the basis of knowledge in physics. Instructor will guide students to distinguish between inferences based on theory and on the outcomes of experiments.
   2. To reinforce the concepts covered in the PHYS A124 lecture.
   3. To provide students with measurement techniques and other experimental skills useful in the study of physical phenomena. The tools to be used include ammeters, voltmeters, capacitance meters, gauss meters, photometers and computerized data collection equipment. The instructor will provide hands-on supervision of the student's use of these tools in a laboratory setting.
   4. To provide the student with data analysis techniques using computers. These include graphing, curve fitting, modeling and statistical analysis. The instructor will provide hands-on supervision of the student's use of these methods in a laboratory setting.
   5. To provide the student with an appreciation of uncertainties in measured quantities and uncertainty analysis techniques.
6. To help students develop collaborative learning skills in the investigation of physical phenomena. The instructor will provide hands-on supervision and guidance to students working in small groups in a laboratory setting.
7. To provide opportunities for students to gain familiarity and experience with the equipment and procedures of a college level physics laboratory.

2. Student Outcomes and Assessment Measures

Students in this Physics lab course will be able to

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>design and conduct experiments and draw inferences from their observations.</td>
<td>Weekly lab reports.</td>
</tr>
<tr>
<td>demonstrate competency applying Maxwell's equations to physical situations.</td>
<td>Weekly lab reports, midterm and final exams.</td>
</tr>
<tr>
<td>demonstrate hands-on competency in using measuring devices.</td>
<td>Performance in a laboratory setting.</td>
</tr>
<tr>
<td>demonstrate hands-on competency in using computers to analyze data.</td>
<td>Performance in a laboratory setting.</td>
</tr>
<tr>
<td>estimate the uncertainty in all physical measurements and will propagate this uncertainty to their final, calculated results.</td>
<td>Weekly lab reports and exams.</td>
</tr>
<tr>
<td>collaborate in small groups to setup equipment, take measurements and analyze data.</td>
<td>Performance in a laboratory setting.</td>
</tr>
<tr>
<td>describe the equipment and safety procedures of a college level physics laboratory.</td>
<td>Demonstrated compliance with laboratory safety procedures and correct operation of equipment under the direction of physics laboratory personnel.</td>
</tr>
</tbody>
</table>

IV. Topical Course Outline

Here is a list of experiments typically performed in the course.

1. Measuring the Spring Constant
2. Standing Waves on a String
3. Sound
4. Equipotentials and Fields
5. Ohm's Law
6. Circuit Analyses with Light Bulbs
7. Kirchhoff's Rules
8. Electromagnetic Induction
9. Building a DC Motor
10. Reflection and Refraction
11. Spherical Mirrors and Lenses

V. Suggested Text


VI. Bibliography


<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>1b. Division</th>
<th>1c. Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS CAS</td>
<td>AMSC Division of Math Science</td>
<td>Physics</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Course Prefix</th>
<th>3. Course Number</th>
<th>4. Previous Course Prefix &amp; Number</th>
<th>5a. Credits/CEUs</th>
<th>5b. Contact Hours (Lecture + Lab)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS</td>
<td>A211L</td>
<td>NA</td>
<td>1</td>
<td>(0+3)</td>
</tr>
</tbody>
</table>

6. Complete Course Title
General Physics I Laboratory

Abbreviated Title for Transcript (30 character)

7. Type of Course
- [x] Academic
- [ ] Preparatory/Development
- [ ] Non-credit
- [ ] CEU
- [ ] Professional Development

8. Type of Action:
- [x] Add
- [ ] Change
- [ ] Delete

9. Repeat Status No
- # of Repeats: 1
- Max Credits: 1

10. Grading Basis
- [x] A-F
- [ ] P/NP
- [ ] NG

11. Implementation Date
- Semester/year: Fall/2011
- To: 9999

12. Cross Listed with
- [ ] Yes
- [x] No

13. Other CCG (please specify)

13a. Impacted Courses or Programs:
List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

<table>
<thead>
<tr>
<th>Impacted Program/Course</th>
<th>Catalog Page(s) Impacted</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Initiator Name (typed): J. Pantaleone
Initiator Signed Initials: J.P.
Initiator Date: 10-15-10

13b. Coordination Email
- Date: 10-15-10
- Sent to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison
- Date: 10-15-10

14. General Education Requirement
- Mark appropriate box:
  - [ ] Oral Communication
  - [ ] Written Communication
  - [ ] Quantitative Skills
  - [ ] Social Sciences
  - [x] Natural Sciences
  - [ ] Integrative Capstone

15. Course Description (suggested length 20 to 50 words)
Calculus-based introductory physics laboratory with experiments in mechanics, fluids and waves using computerized data collection and analysis. Special Note: Requires hands-on use of instruments and performance of experiments in a college or university laboratory.

16a. Course Prerequisite(s) (list prefix and number)
PHYS A211 with a minimum grade of C or concurrent enrollment.

16b. Test Score(s)
- NA

16c. Co-requisite(s) (concurrent enrollment required)
- NA

16d. Other Restriction(s)
- College
- Major
- Class
- Level

16e. Registration Restriction(s) (non-codable)
- If the equivalent of PHYS A211 is taken from another institution, it must be completed prior to taking PHYS A211L

17. [ ] Mark if course has fees

18. [ ] Mark if course is a selected topic course

19. Justification for Action
To clarify expectations for a physics lab course.

Initiator (faculty only) Date
Initiator (TYPE NAME) Date

[ ] Approved
[ ] Disapproved

Dean/Director of School/College Date
Undergraduate/Graduate Academic Date
Department Chairperson Date
Board Chairperson Date
Curriculum Committee Chairperson Date
Provost or Designee Date
### 13a. Impacted Courses or Programs

<table>
<thead>
<tr>
<th>Impacted Program/Courses</th>
<th>Catalog Page(s) Impacted</th>
<th>Date of Coord.</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological, BS</td>
<td>95</td>
<td>10/15/2010</td>
<td>Bio Chair, Causey</td>
</tr>
<tr>
<td>Chemistry, BS</td>
<td>97</td>
<td>10/15/2010</td>
<td>Chem Chair, Holmberg</td>
</tr>
<tr>
<td>Physics, Minor</td>
<td>120</td>
<td>10/15/2010</td>
<td>Phys Chair, Pantaleone</td>
</tr>
<tr>
<td>Civil Eng., BS</td>
<td>224</td>
<td>10/15/2010</td>
<td>CE Chair, Smith</td>
</tr>
<tr>
<td>Engineering, BS</td>
<td>227</td>
<td>10/15/2010</td>
<td>BSE Chair, Baker</td>
</tr>
<tr>
<td>Geomatics, AS&amp;BS</td>
<td>231</td>
<td>10/15/2010</td>
<td>GEO Chair, Davis</td>
</tr>
<tr>
<td>ES A209</td>
<td>387</td>
<td>10/15/2010</td>
<td>ENG Dean, Lang</td>
</tr>
<tr>
<td>ES A341</td>
<td>387</td>
<td>10/15/2010</td>
<td>ENG Dean, Lang</td>
</tr>
<tr>
<td>CAS BS</td>
<td>85</td>
<td>10/15/2010</td>
<td>Anth Chair, Hanson</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/15/2010</td>
<td>Bio Chair, Causey</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/15/2010</td>
<td>CS Chair, Thiru</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/15/2010</td>
<td>Geol Chair, Munk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/15/2010</td>
<td>Math Chair, Thiru</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/15/2010</td>
<td>Psych Chair, Rosich</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/15/2010</td>
<td>Soc Chair, Riley</td>
</tr>
<tr>
<td>UAA Branch Campuses</td>
<td></td>
<td>10/15/2010</td>
<td></td>
</tr>
<tr>
<td>Kenai</td>
<td></td>
<td>10/15/2010</td>
<td>Dir. Turner</td>
</tr>
<tr>
<td>Kodiak</td>
<td></td>
<td>10/15/2010</td>
<td>Dir. Bolson</td>
</tr>
<tr>
<td>Mat-Su</td>
<td></td>
<td>10/15/2010</td>
<td>Dir. Clark</td>
</tr>
</tbody>
</table>
COURSE CONTENT GUIDE

I. Date of Initiation: October 15, 2010

II. Course Information

1. College: CAS
2. Course Subject: PHYS
3. Course Number: A211L
4. Number of Credits: 1
5. Number of Contact Hours: 0+3
6. Course Title: General Physics I Laboratory
7. Grading Basis: A-F
8. Course Description:

Calculus-based introductory physics laboratory with experiments in mechanics, fluids and waves using computerized data collection and analysis. Special Note: Requires hands-on use of instruments and performance of experiments in a college or university laboratory.

9. Course Prerequisite:

PHYS A211 with a minimum grade of C or concurrent enrollment.

III. Instructional Goals and Student Outcomes

1. Instructional Goals

1. To help students understand the basis of knowledge in physics. Instructor will guide students to distinguish between inferences based on theory and on the outcomes of experiments.
2. To reinforce the concepts covered in the PHYS A211 lecture.
3. To provide students with measurement techniques and other experimental skills useful in the study of physical phenomena. The tools to be used include rulers, micrometers, sonic range finders, force sensors, video analysis and computerized data collection equipment. The instructor will provide hands-on supervision of the student's use of these tools in a laboratory setting.
4. To provide the student with data analysis techniques using computers. These include graphing, curve fitting, modeling and statistical analysis. The instructor will provide hands-on supervision of the student's use of these methods in a laboratory setting.
5. To provide the student with an appreciation of uncertainties in measured quantities and uncertainty analysis techniques.
6. To help students develop collaborative learning skills in the investigation of physical phenomena. The instructor will provide hands-on supervision and guidance to students working in small groups in a laboratory setting.
7. To provide opportunities for students to gain familiarity and experience with the equipment and procedures of a college level physics laboratory.

2. Student Outcomes and Assessment Measures

The students in this Physics lab course will be able to

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>design and conduct experiments and draw inferences from their observations.</td>
<td>Weekly lab reports.</td>
</tr>
<tr>
<td>demonstrate competency applying Newton's laws to physical situations.</td>
<td>Weekly lab reports, midterm and final exams.</td>
</tr>
<tr>
<td>demonstrate hands-on competency in using measuring devices.</td>
<td>Performance in a laboratory setting.</td>
</tr>
<tr>
<td>demonstrate hands-on competency in using computers to analyze data.</td>
<td>Performance in a laboratory setting.</td>
</tr>
<tr>
<td>estimate the uncertainty in all physical measurements and will propagate this uncertainty to their final, calculated results.</td>
<td>Weekly lab reports and exams.</td>
</tr>
<tr>
<td>collaborate in small groups to set up equipment, take measurements and analyze data.</td>
<td>Performance in a laboratory setting.</td>
</tr>
<tr>
<td>describe the equipment and safety procedures of a college level physics laboratory.</td>
<td>Demonstrated compliance with laboratory safety procedures and correct operation of equipment under the direction of physics laboratory personnel.</td>
</tr>
</tbody>
</table>

IV. Topical Course Outline

Here is a list of experiments typically performed in the course.

1. Position, Velocity and Acceleration Graphs
2. Vector Addition
3. 2D Kinematics
4. Propagation of Errors
5. Cart on an Inclined Plane
6. Acceleration of a Sliding Box.
7. Conservation of Momentum
8. Ballistic Pendulum
9. Rotational Motion
10. Simple Harmonic Motion
11. Waves on a String
12. Added Mass of a Ball in the Air

V. Suggested Text


VI. Bibliography


## Course Action Request

**University of Alaska Anchorage**  
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College  
AS CAS

1b. Division  
AMSC Division of Math Science

1c. Department  
Physics

2. Course Prefix  
PHYS

3. Course Number  
A212L

4. Previous Course Prefix & Number  
NA

5a. Credits/CEUs  
1

5b. Contact Hours  
(0+3)

6. Complete Course Title  
General Physics II Laboratory

Abbreviated Title for Transcript (30 character)

7. Type of Course  
☑ Academic  ☐ Preparatory/Development  ☐ Non-credit  ☐ CEU  ☐ Professional Development

8. Type of Action:  
☐ Add  ☑ Change  ☐ Delete

If a change, mark appropriate boxes:

- Prefix
- Credits
- Title
- Grading Basis
- Course Description
- Test Score Prerequisites
- Other Restrictions
- Class
- Level
- College
- Major
- Other CCG (please specify)

9. Repeat Status No  
# of Repeats  
Max Credits

10. Grading Basis  
☑ A-F  ☐ P/NP  ☐ NG

11. Implementation Date  
semester/year

From: Fall/2011  
To: /9999

12. ☐ Cross Listed with  NA

Stacked with  NA

Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at [www.uaa.alaska.edu/governance](http://www.uaa.alaska.edu/governance).

<table>
<thead>
<tr>
<th>Impacted Program/Course</th>
<th>Catalog Page(s) Impacted</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. see attached sheet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Initiator Name (typed): J. Pantaleone  
Initiator Signed Initials:  
Date:

13b. Coordination Email  
Date: 10-15-10

submitted to Faculty Listserv:  
(uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison  
Date: 10-15-10

14. General Education Requirement  
Mark appropriate box:

- Oral Communication
- Written Communication
- Social Sciences
- Quantitative Skills
- Natural Sciences
- Fine Arts
- Humanities
- Integrative Capstone

15. Course Description (suggested length 20 to 50 words)  

Calculus-based introductory physics laboratory with experiments in electric and magnetic fields, circuits and light using computerized data collection and analysis. Special Note: Requires hands-on use of instruments and performance of experiments in a college or university laboratory.

16a. Course Prerequisite(s) (list prefix and number)  

[PHYS A211 and PHYS A211L] with minimum grades of C and [PHYS A212 with a minimum grade of C or concurrent enrollment].

16b. Test Score(s)

16c. Co-requisite(s) (concurrent enrollment required)

16d. Other Restriction(s)  

- College
- Major
- Class
- Level

16e. Registration Restriction(s) (non-codable)

If the equivalent of PHYS A212 is taken from another institution, it must be completed prior to taking PHYS A212L

17. ☑ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action  

To clarify expectations for a physics lab course and to add PHYS 211L as a prerequisite

<table>
<thead>
<tr>
<th>Initiator (faculty only)</th>
<th>Date</th>
<th>Approved</th>
<th>Disapproved</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dean/Director of School/College</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Initiator (TYPE NAME)</th>
<th>Date</th>
<th>Approved</th>
<th>Disapproved</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Undergraduate/Graduate Academic</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Board Chairperson</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Provost or Designee</td>
</tr>
</tbody>
</table>

33
13a. Impacted Courses or Programs

<table>
<thead>
<tr>
<th>Impacted Program/Courses</th>
<th>Catalog Page(s) Impacted</th>
<th>Date of Coord.</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological, BS</td>
<td>95</td>
<td>10/15/2010</td>
<td>Bio Chair, Causey</td>
</tr>
<tr>
<td>Chemistry, BS</td>
<td>97</td>
<td>10/15/2010</td>
<td>Chem Chair, Holmberg</td>
</tr>
<tr>
<td>Physics, Minor</td>
<td>120</td>
<td>10/15/2010</td>
<td>Phys Chair, Pantaleone</td>
</tr>
<tr>
<td>Civil Eng., BS</td>
<td>224</td>
<td>10/15/2010</td>
<td>CE Chair, Smith</td>
</tr>
<tr>
<td>Engineering, BS</td>
<td>227</td>
<td>10/15/2010</td>
<td>BSE Chair, Baker</td>
</tr>
<tr>
<td>Geomatics, AS&amp;BS</td>
<td>231</td>
<td>10/15/2010</td>
<td>GEO Chair, Davis</td>
</tr>
<tr>
<td>CHEM 331</td>
<td>345</td>
<td>10/15/2010</td>
<td>Chem Chair, Holmberg</td>
</tr>
<tr>
<td>EE 314</td>
<td>381</td>
<td>10/15/2010</td>
<td>BSE Chair, Baker</td>
</tr>
<tr>
<td>PHYS 314</td>
<td>452</td>
<td>10/15/2010</td>
<td>Phys Chair, Pantaleone</td>
</tr>
<tr>
<td>CAS BS</td>
<td>85</td>
<td>10/15/2010</td>
<td>Anth Chair, Hanson</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/15/2010</td>
<td>Bio Chair, Causey</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/15/2010</td>
<td>CS Chair, Thiru</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/15/2010</td>
<td>Geol Chair, Munk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/15/2010</td>
<td>Math Chair, Thiru</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/15/2010</td>
<td>Psych Chair, Rosich</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/15/2010</td>
<td>Soc Chair, Riley</td>
</tr>
</tbody>
</table>

UAA Branch Campuses

<table>
<thead>
<tr>
<th>Campus</th>
<th>Date of Coord.</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenai</td>
<td>10/15/2010</td>
<td>Dir. Turner</td>
</tr>
<tr>
<td>Kodiak</td>
<td>10/15/2010</td>
<td>Dir. Bolson</td>
</tr>
<tr>
<td>Mat-Su</td>
<td>10/15/2010</td>
<td>Dir. Clark</td>
</tr>
</tbody>
</table>
COURSE CONTENT GUIDE

I. Date of Initiation: October 15, 2010

II. Course Information

1. College: CAS
2. Course Subject: PHYS
3. Course Number: A212L
4. Number of Credits: 1
5. Number of Contact Hours: 0+3
6. Course Title: General Physics II Laboratory
7. Grading Basis: A-F
8. Course Description:
   Calculus-based introductory physics laboratory with experiments in electric and magnetic fields, circuits and light using computerized data collection and analysis. Special Note: Requires hands-on use of instruments and performance of experiments in a college or university laboratory.

9. Course Prerequisite:
   [PHYS A211 and PHYS A211L] with minimum grades of C and [PHYS A212 with a minimum grade of C or concurrent enrollment].

III. Instructional Goals and Student Outcomes

1. Instructional Goals

   1. To help students understand the basis of knowledge in physics. Instructor will guide students to distinguish between inferences based on theory and on the outcomes of experiments.
   2. To reinforce the concepts covered in the PHYS A212 lecture.
   3. To provide students with measurement techniques and other experimental skills useful in the study of physical phenomena. The tools to be used include ammeters, voltmeters, capacitance meters, gauss meters, oscilloscopes, photometers and computerized data collection equipment. The instructor will provide hands-on supervision of the student's use of these tools in a laboratory setting.
   4. To provide the student with data analysis techniques using computers. These include graphing, curve fitting, modeling and statistical analysis. The instructor will provide hands-on supervision of the student's use of these methods in a laboratory setting.
   5. To provide the student with an appreciation of uncertainties in measured quantities and uncertainty analysis techniques.
6. To help students develop collaborative learning skills in the investigation of physical phenomena. The instructor will provide hands-on supervision and guidance to students working in small groups in a laboratory setting.

7. To provide opportunities for students to gain familiarity and experience with the equipment and procedures of a college level physics laboratory.

2. Student Outcomes and Assessment Measures

Students in this Physics lab course will be able to

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>design and conduct experiments and draw inferences from their observations.</td>
<td>Weekly lab reports.</td>
</tr>
<tr>
<td>demonstrate competency applying Maxwell's equations to physical situations.</td>
<td>Weekly lab reports, midterm and final exams.</td>
</tr>
<tr>
<td>demonstrate hands-on competency in using measuring devices.</td>
<td>Performance in a laboratory setting.</td>
</tr>
<tr>
<td>demonstrate hands-on competency in using computers to analyze data.</td>
<td>Performance in a laboratory setting.</td>
</tr>
<tr>
<td>estimate the uncertainty in all physical measurements and will propagate this uncertainty to their final, calculated results.</td>
<td>Weekly lab reports and exams.</td>
</tr>
<tr>
<td>collaborate in small groups to set up equipment, take measurements and analyze data.</td>
<td>Performance in a laboratory setting.</td>
</tr>
<tr>
<td>describe the equipment and safety procedures of a college level physics laboratory.</td>
<td>Demonstrated compliance with laboratory safety procedures and correct operation of equipment under the direction of physics laboratory personnel.</td>
</tr>
</tbody>
</table>

IV. Topical Course Outline

Here is a list of experiments typically performed in the course.

1. Coulomb's Law
2. Electric Forces and Fields
3. I vs. V for Resistors and Diodes
4. Mystery Circuits
5. Capacitors
6. Magnetic Field of Magnet
7. Charge to Mass Ratio for the Electron
8. Induction, Faraday's Law
9. Build a Motor
10. Geometric Optics
11. Interference and Diffraction of Light

V. Suggested Text


VI. Bibliography


**Course Action Request**
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

<table>
<thead>
<tr>
<th>1a. School or College</th>
<th>AS CAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1b. Division</td>
<td>AMSC Division of Math Science</td>
</tr>
<tr>
<td>1c. Department</td>
<td>Mathematical Sciences</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Course Prefix</th>
<th>STAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Course Number</td>
<td>A307</td>
</tr>
<tr>
<td>4. Previous Course Prefix &amp; Number</td>
<td>N/A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5a. Credits/CEUs</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>5b. Contact Hours (Lecture + Lab)</td>
<td>(4+0)</td>
</tr>
</tbody>
</table>

6. Complete Course Title
Probability and Statistics

<table>
<thead>
<tr>
<th>7. Type of Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ Academic</td>
</tr>
<tr>
<td>☐ Preparatory/Development</td>
</tr>
<tr>
<td>☐ Non-credit</td>
</tr>
<tr>
<td>☐ CEU</td>
</tr>
<tr>
<td>☐ Professional Development</td>
</tr>
</tbody>
</table>

8. Type of Action: ❑ Add or ☑ Change or ☐ Delete

If a change, mark appropriate boxes:
- ☑ Prefix
- ☐ Credits
- ☑ Title
- ☑ Grading Basis
- ☑ Course Description
- ☑ Test Score Prerequisites
- ☐ Other Restrictions

9. Repeat Status No
- ☑ # of Repeats
- ☑ Max Credits

10. Grading Basis
- ☑ A-F
- ☐ P/NP
- ☐ NG

11. Implementation Date
- ☑ semester/year
- From: Fa/2011
- To: /9999

12. Cross Listed with
- ☐ Stacked with
- Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at [www.uaa.alaska.edu/governance](http://www.uaa.alaska.edu/governance).

<table>
<thead>
<tr>
<th>Impacted Program/Course</th>
<th>Catalog Page(s)</th>
<th>Impacted</th>
<th>Date of Coordination</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Initiator Name (typed): Kanapathi Thiru
Initiator Signed Initials: _________
Date: __________________

13b. Coordination Email
Date: 11/04/2010
submitted to Faculty Listserv: [uaa-faculty@lists.uaa.alaska.edu](mailto:uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison
Date: 11/10/2010

14. General Education Requirement
Mark appropriate box:
- ☑ Oral Communication
- ☑ Written Communication
- ☑ Quantitative Skills
- ☑ Social Sciences
- ☑ Natural Sciences
- ☑ Integrative Capstone

15. Course Description (suggested length 20 to 50 words)
A calculus-based introduction to probability and statistics with emphasis on scientific applications. Topics include probability, probability distributions for discrete and continuous random variables, joint distributions, mathematical expectation, moment generators, functions of random variables, estimation, and the study of power and significance of hypothesis tests.

16a. Course Prerequisite(s) (list prefix and number) (MATH A201 or MATH A272) with a grade of C or higher

16b. Test Score(s)
N/A

16c. Co-requisite(s) (concurrent enrollment required)
N/A

16d. Other Restriction(s)
- ☐ College
- ☐ Major
- ☐ Class
- ☐ Level

16e. Registration Restriction(s) (non-codable)
N/A

17. ☐ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action
To bridge the gaps between STAT A307 and other subsequent STAT/MATH courses such as STAT A308 and MATH A371.

Initiator (faculty only)
Rieken Venema
Initiator (TYPE NAME)

Approved
Date
Disapproved
Dean/Director of School/College
Date

Approved
Undergraduate/Graduate Academic
Date
Disapproved
Board Chairperson
Date

Approved
Provost or Designee
Date
## Course Being Changed: STAT A307

<table>
<thead>
<tr>
<th>Impacted Program or Course</th>
<th>Type of Impact (course or program)</th>
<th>Catalog Page</th>
<th>Type/Date of Notification</th>
<th>Chair/Coordinator Contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA/BS</td>
<td>Course Impacts: prerequisite, corequisite, recommended</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anthropology BA/BS</td>
<td>Program Selective</td>
<td>88</td>
<td></td>
<td>Christine Hanson</td>
</tr>
<tr>
<td>Biology BS</td>
<td>Program Selective</td>
<td>95</td>
<td></td>
<td>Doug Causey</td>
</tr>
<tr>
<td>Computer Science BA</td>
<td>Program Selective</td>
<td>98</td>
<td></td>
<td>Sam Thiru</td>
</tr>
<tr>
<td>Computer Science BS</td>
<td>Program Requirement</td>
<td>99</td>
<td></td>
<td>Sam Thiru</td>
</tr>
<tr>
<td>Geological Science</td>
<td>Program Selective</td>
<td>104</td>
<td></td>
<td>LeeAnn Munk</td>
</tr>
<tr>
<td>Mathematics BA</td>
<td>Program Requirement</td>
<td>113</td>
<td></td>
<td>Sam Thiru</td>
</tr>
<tr>
<td>Mathematics BS</td>
<td>Program Requirement</td>
<td>113</td>
<td></td>
<td>Sam Thiru</td>
</tr>
<tr>
<td>Statistics Minor</td>
<td>Program Requirement</td>
<td>124</td>
<td></td>
<td>Sam Thiru</td>
</tr>
<tr>
<td>Nursing Science</td>
<td>Program Selective</td>
<td>158</td>
<td></td>
<td>Gail Holtzman</td>
</tr>
<tr>
<td>Geomatics BS</td>
<td>Program Selective</td>
<td>231</td>
<td></td>
<td>Donald Davies</td>
</tr>
<tr>
<td>MATH A371</td>
<td>Prerequisite</td>
<td>420</td>
<td></td>
<td>Sam Thiru</td>
</tr>
<tr>
<td>MATH A407</td>
<td>Prerequisite</td>
<td>420</td>
<td></td>
<td>Sam Thiru</td>
</tr>
<tr>
<td>STAT A308</td>
<td>Prerequisite</td>
<td>470</td>
<td></td>
<td>Sam Thiru</td>
</tr>
<tr>
<td>STAT A402</td>
<td>Prerequisite</td>
<td>470</td>
<td></td>
<td>Sam Thiru</td>
</tr>
<tr>
<td>STAT A407</td>
<td>Prerequisite</td>
<td>470</td>
<td></td>
<td>Sam Thiru</td>
</tr>
</tbody>
</table>
I. Course Description:

A calculus-based introduction to probability and statistics with emphasis on scientific applications. Topics include probability, probability distributions for discrete and continuous random variables, joint distributions, mathematical expectation, moment generators, functions of random variables, estimation, and the study of power and significance of hypothesis tests.

II. Prerequisites: (MATH A201 or MATH A272) with a grade of C or higher

III. Grading Basis: A-F

IV. Instructional Goals and Student Outcomes

(a) Instructional Goals. The instructor will:
   • Introduce the basic concepts of probability theory.
   • Introduce density functions, distribution functions, mathematical expectations and moment generators for discrete and continuous random variables.
   • Present a wide variety of discrete and continuous probability distributions, and introduce the theory of transformation in a single variable case.
   • Introduce students to point estimation, and provide the theoretical background for different aspects of statistical inference such as interval estimation and testing hypotheses.

(b) Student Outcomes. Students will be able to:
   • Apply basic concepts of probability theory and statistics to applied problems in sciences.
   • Demonstrate the relationship between random variables and their distribution functions, and apply transformations of a single variable.
   • Use estimation theory including point and interval estimation.
   • Formulate hypothesis, calculate the power of a test, and make a decision based on the value of a test statistic or p-value.
V. Guidelines for evaluation
The course will be graded on an A-F basis determined by in-class and/or take-home examinations and class projects. Specifics will be stated in the class syllabus for the course.

VI. Course level justification
The course requires knowledge of topics typically covered in the prerequisite courses of MATH A201 or MATH A272.

VII. Topical course outline
1. Introduction to Probability
   1.1 Interpretation of Probabilities
   1.2 Sample Space and Events
   1.3 Counting Rules and Classical Probability

2. Some Probability Laws
   2.1 Axioms of Probability
   2.2 Conditional Probability
   2.3 Independent Events
   2.4 Bayes’ Theorem

3. Discrete Distributions
   3.1 Random Variables and Probability Mass Functions
   3.2 Cumulative Distribution Function
   3.3 Mathematical Expectation
   3.4 Mean, Variance and Standard Deviation
   3.5 Moment Generating Function
   3.6 Bernoulli and Binomial Distributions
   3.7 Geometric and Negative Binomial Distributions
   3.8 Hypergeometric Distribution
   3.9 Poisson Distribution

4. Continuous Distributions
   4.1 Random Variables and Probability Density Functions
   4.2 Cumulative Distribution Function
   4.3 Mathematical Expectation
   4.4 Moment Generating Function
   4.5 Uniform Distribution
   4.6 Exponential and Gamma Distributions
   4.7 Normal Distribution

5. Determining the Distribution of a Transformed Random Variable
   5.1 Transforming a Random Variable with a Discrete Distribution
   5.2 Transforming a Random Variable with a Continuous Distribution
6. Joint Distributions (discrete case only)
   6.1 Joint and Marginal Distributions
   6.2 Independence
   6.3 Mathematical Expectation
   6.4 Covariance and Variance of Sum of Random Variables
   6.5 Correlation

7. Sampling
   7.1 Random Sampling
   7.2 Sampling Distributions
   7.3 Central Limit Theorem
   7.4 Normal Approximation for Discrete Distributions

8. Parameter Estimation
   8.1 Point Estimation
   8.2 Unbiased Estimators
   8.3 Interval Estimation: Confidence Intervals

9. Hypothesis Testing
   9.1 Null and Alternative Hypotheses
   9.2 Level of Significance
   9.3 Hypothesis Testing of Certain Parameters
   9.4 Power, Sample Size, and Operating Characteristic Curves

VIII. Suggested Texts

IX. Bibliography