Wilkes University Curriculum Committee

PROPOSAL SUBMITTAL FORM

Directions:
- Use this set of forms for all proposals sent to the Curriculum Committee.
- Pages 1-3 of this document are required. Any unnecessary forms should be deleted from the packet before submissions. If multiple forms are needed (course addition, course deletion, etc), simply copy and paste additional forms into this packet.
- Note that all new programs (majors and minors) and program eliminations must be reviewed and approved by the Provost and APC prior to submission to the Curriculum Committee. Significant program revisions must also undergo review and approval by the Provost. The Provost will determine if a significant proposal revision requires approval by the APC. Revisions to the General Education curriculum originate from the General Education Committee and must be reviewed and approved by the Provost.
- Completed (and signed) forms are due on the first Tuesday of every month. Submit one signed copy to the Chair of the Curriculum Committee.

1. Originator:
   - Dr. Rodney Ridley, Director
   - Division of Engineering and Physics
   - Tel: 570-408-4810
   - Email: Rodney.ridley@wilkes.edu
   - Dr. Jamal Ghorieshi,
   - Division of Engineering and Physics
   - Tel: 570-408-4889
   - Email: jamal.ghorieshi@wilkes.edu

2. Proposal Title: Baccalaureate of Arts degree in Physics (BA in Physics)

3. Check only one type of proposal: (double click on the appropriate check box and change default value to “checked”).

- New Program. (Major or Minor Degree Programs, Certificate Programs). This requires prior review and approval by the Provost and APC.
- ☐ Elimination of Program. (Major or Minor Degree Programs). This requires prior review and approval by the Provost and APC.
- ☐ Program Revision. Significant revisions to a program require review and approval by the Provost. The Provost determines if review and approval by APC is necessary.
- ☐ General Education Revision. Submissions only accepted from the General Education Committee (GEC). Must be reviewed and approved by the Provost.
- ☐ Creation of new departments, elimination of existing department. This requires prior review and approval by the Provost and APC.
- ☐ Course additions or deletions not affecting programs (such as elective courses, transition of “topics” courses to permanent courses).
- ☐ Change in course credit or classroom hours.
- ☐ Incidental Changes. Includes changes in course/program title, course descriptions, and course prerequisites. (Although these changes do require approval by the Curriculum Committee, they do not go before the full faculty for approval).
- ☐ Other (Specify)
4. Indicate the number of course modification forms that apply to this proposal:

5. Course Addition Form (plus syllabi)
3. Course Deletion Form
2. Course Change Form

5. Executive Summary of Proposal.

Briefly summarize this proposal. The breadth and depth of this executive summary should reflect the complexity and significance of the proposal. Include an overview of the proposal, background and reasoning behind the proposal and a description of how the proposal relates to the mission and strategic long-range plan of the unit and/or university. For incidental changes a one or two sentence explanation is adequate.

Insert Text Here...

The Division of Engineering and Physics (DEP) in the College of Science and Engineering proposes to create a full-time Baccalaureate of Art degree in Physics (BA in Physics). This Baccalaureate of Art degree in Physics, is designed to offer a track for all students who will be combining the study of physics with other career goals. Primary among them are those students who wish to become certified in Physics by the "PA Department of Education" to teach high school physics and other science courses. In addition, the Baccalaureate of Art degree in Physics program will support students who may wish to concentrate on careers in medicine, dentistry, or law.

High school students in this country have scored, in physics tests, generally lower than students from other countries. This may be partly due to the fact that many of our high school physics teachers are poorly prepared. In many cases the one teaching physics has little or no training in physics and only a minority holds a degree in physics. Hence there is a crucial need for an increase in number of math and science teachers who are prepared to meet the challenges of today's high school needs. This Baccalaureate of Art degree in Physics program will provide a strong foundation by emphasis on both problem solving and hands-on learning.

In NEPA, Wilkes University had a major role in preparing high school physics teachers from 1987 to 2002. The nationwide shortage of high school teachers in math and science has had a profound downside effect on high school students' science learning. Through rejuvenating the BA in Physics and preparing high school physics teachers, Wilkes University supports its mission of commitment to the local community and as well as to foster regional growth and development.

To meet this need, the Division of Engineering and Physics (DEP) has developed a BA in physics program consisting of 124 credit hour of course work. This BA degree will be developed as a face-to-face program with a goal of offering an on-line program goal in the near future.
What other programs, if any, will be affected by this proposal? Describe what resources are available for this proposal. Are they adequate? What would be the effect on the curriculum of all potentially affected programs if this proposal were adopted? Include any potential effects to the curriculum of current programs, departments and courses.

Insert Text Here...

The Baccalaureate of Art degree in Physics (BA in Physics) will build on the current course offering from the undergraduate electrical and mechanical engineering programs. It will also draw from the undergraduate mathematics and environmental science programs, as well as the education program. However, it will only have a minor influence on those classes’ enrollments.

The College of Sciences and Engineering is presently in the process of hiring one full time faculty in biology/physics and one replacement faculty in physics. These two hires will boost the division of engineering and physics course delivery strength. Moreover, no new laboratory needs to be added for the BA in Physics.

7. Program Outline. (Not applicable for incidental changes).

A semester-by-semester program outline as it would appear in the bulletin for a new program or any modified program with all changes clearly indicated.

**Physics Bachelor of Arts Degree Required Courses and Recommended Course Sequence (123 Credits)**

<table>
<thead>
<tr>
<th>First Semester</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY 201 General Physics I</td>
<td>4</td>
</tr>
<tr>
<td>ENG 101</td>
<td>4</td>
</tr>
<tr>
<td>MTH 111 Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>FYF 101 First Year Foundations</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY 202 General Physics II</td>
<td>4</td>
</tr>
<tr>
<td>Distribution Requirement</td>
<td>3</td>
</tr>
<tr>
<td>Physics Elective</td>
<td>4</td>
</tr>
<tr>
<td>MTH 112 Calculus II</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>
### Third Semester
- CHM 115 Elem. & Comp. Lab 1
- CHM 113 Elem. & Comp. 3
- PHY 203 General Physics III 3
- Combination Program Elective 3
- Distribution Requirement 3
- MTH 211 Differential Equations 4

### Total for Third Semester: 17

### Fourth Semester
- BIO 121 General Biology Lab 1
- OR Physics Elective
- BIO 121 General Biology Lecture 3
- OR Physics Elective
- Physics Elective 3
- Combination Program Elective 3
- Distribution Requirement 6

### Total for Fourth Semester: 16

### Fifth Semester
- Physics Elective 6
- EE 337 Electromagnetics I 3
- Combination Program Elective 3
- Distribution Requirements 3

### Total for Fifth Semester: 15

### Sixth Semester
- Physics Elective 3
- Combination Program Elective 9
- Distribution Requirements 3

### Total for Sixth Semester: 15

### Seventh Semester
- Physics Elective 3
- Combination Program Electives 4
- PHY 391 Senior Project 1
- Free Electives 6

### Total for Seventh Semester: 14

### Eighth Semester
- PHY 392 Senior Project 2
- EDSP (Education) 388 or Elective 3
- ED 390 Student Teaching or Elective 12

### Total for Eighth Semester: 17

### The Minor Requirements for Secondary Education Certification:
- ED 180 Education Psychology (3)
- ED 190 Efficient Teaching (3)
- ED 191 Integrating Technology in Classroom (3)
ED 220 Teaching Culturally and Linguistically Diverse Learners (OPO) (3)
EDSP 210 Teaching Students with Special Needs (3)
EDSP 225 Special Education Methodology (OPO) (3)
ED 371 Teaching Methods in Science (3)
ED 380 Content Area Literacy (3)

**Physics Electives:**

Physics electives can be selected from any 200 and above technical courses from electrical engineering, mechanical engineering or closely related field. However, students with concentration on teaching certification have to take the following as part of their physics electives: PHY 311 Thermodynamics, PHY 312 Analytical Mechanics, PHY 314 Quantum Mechanics.
8. Signatures and Recommendations. (please date)
   • Signatures of involved Department chair(s) and Dean(s) indicate agreement with the proposal and that adequate resources (library, faculty, technology) are available to support proposal.
   • If a potential signatory disagrees with a proposal he/she should write “I disagree with this proposal” and a signed statement should be attached to this submission.

Dr. Rodney Ridley, Director, Division of Engineering and Physics  
Print Name/Title  Signature  Date
Department chair(s) of all potentially affected programs
Dr. Barbara Bracken, Chairperson, Mathematics and Computer sciences  
Print Name/Title  Signature  Date
Department chair(s) of all potentially affected programs

Dr. Dale Bruns, Dean, College of Sciences and Engineering  
Print Name/Title  Signature  Date
Dean (s) of any potentially affected College/School.
Dr. Caroline Maurer, Associate Dean/Chairperson, School of Education  
Print Name/Title  Signature  Date
Department chair(s) of all potentially affected programs

Dr. Michael Speziale, Dean, College of Graduate and Professional Studies and School of Education  
Print Name/Title  Signature  Date
Dean (s) of any potentially affected College/School.
Ms. Susan Hritzak, Registrar  
Print Name  Signature  Date
Registrar

Dr. C. Reynold Verret, Provost  
Print Name  Signature  Date
Provost (For new programs, program elimination, significant program revisions and revisions to the General Education curriculum).
Provost should check here if this proposal is a program revision AND the significance of the revision requires review and approval by APC prior to Curriculum Committee.

Dr. Mary McManus, Chairperson, Academic Planning Committee  
Print Name  Signature  Date
For new programs, program elimination, and significant program revisions sent via the provost. Signature indicates that the proposal has been reviewed and approved by APC.

Chair, General Education Committee. For revisions to General Education curriculum only. (Signature indicates that the proposal has been approved by GEC).
Wilkes University Curriculum Committee
COURSE ADDITION FORM

1. Course Title: Senior Projects 1

2. Course Number: __PHY 391________________________
   Coordinate with Registrar to insure course number is available

3. Total Course Credit Hours: ___1____
   Classroom Hours ___X___  Lab Hours ____  Other ____

4. Course Prerequisites: Senior Standing in Physics

5. Course Description (as proposed for the Bulletin): Course descriptions provide an overview of the topics covered. If the course is offered on a scheduled basis, i.e. every other year, or only during a set semester, note this in the description. Course descriptions should be no more than two to three sentences in length.

   Insert Text Here...

   Design and development of selected projects in the field of Physics under the direction of a staff member. Technical as well as economical factors will be considered in the design. A detailed progress report is required.

6. Required Documentation:
   Proposed Syllabus  Attach proposed syllabus immediately after this document. In some situations the official syllabus may contain information which is beyond the review needs of the Curriculum Committee (such as extensive rubrics, etc). It is permissible to attach an abbreviated syllabus. In general, syllabi (whether full or abbreviated) should contain the following information: Course Title, Course Number, Credit hours, Faculty Information (name contact information, office hours), Course Description, Course Outcomes or Objectives, Assessment (grading) informations, required texts (or other things such as tools, software, etc), pertinent policies and a proposed schedule of topics.
Wilkes University Curriculum Committee
COURSE ADDITION FORM

1. Course Title: Senior Projects II

2. Course Number: PHY 392

   Coordinate with Registrar to insure course number is available

3. Total Course Credit Hours: 2
   Classroom Hours X Lab Hours Other

4. Course Prerequisites: Senior Standing in Physics

5. Course Description (as proposed for the Bulletin):
   Course descriptions provide an overview of the topics covered. If the course is offered on a scheduled basis, i.e. every other
   year, or only during a set semester, note this in the description. Course descriptions should be no more than two to three sentences in length.

   Insert Text Here...

   Design and development of selected projects in the field of Physics under the direction of a staff
   member. Technical as well as economical factors will be considered in the design. A professional
   paper and detailed progress report is required. This is a continuation of PHY391. An open-forum
   presentation and discussion of final achievement is required.

6. Required Documentation:
   Proposed Syllabus  Attach proposed syllabus immediately after this document. In
   some situations the official syllabus may contain information which is beyond the review needs
   of the Curriculum Committee (such as extensive rubrics, etc). It is permissible to attach an
   abbreviated syllabus. In general, syllabi (whether full or abbreviated) should contain the
   following information: Course Title, Course Number, Credit hours, Faculty Information
   (name contact information, office hours), Course Description, Course Outcomes or Objectives,
   Assessment (grading) informations, required texts (or other things such as tools, software, etc),
   pertinent policies and a proposed schedule of topics.
Wilkes University Curriculum Committee
COURSE ADDITION FORM

1. Course Title: Thermodynamics

2. Course Number: PHY 311
Coordinate with Registrar to insure course number is available

3. Total Course Credit Hours: 3
   Classroom Hours X Lab Hours Other

4. Course Prerequisites: Senior Standing in Physics

5. Course Description (as proposed for the Bulletin): Course descriptions provide an overview of the topics covered. If the course is offered on a scheduled basis, i.e. every other year, or only during a set semester, note this in the description. Course descriptions should be no more than two to three sentences in length.

   Insert Text Here...

   PHY 311 - The fundamental concepts and laws of thermodynamics. Carnot cycle, entropy and application. Kinetic theory, statistical mechanics, and application to fundamental systems. Three lecture per week

6. Required Documentation:
   Proposed Syllabus Attach proposed syllabus immediately after this document. In some situations the official syllabus may contain information which is beyond the review needs of the Curriculum Committee (such as extensive rubrics, etc). It is permissible to attach an abbreviated syllabus. In general, syllabi (whether full or abbreviated) should contain the following information: Course Title, Course Number, Credit hours, Faculty Information (name contact information, office hours), Course Description, Course Outcomes or Objectives, Assessment (grading) informations, required texts (or other things such as tools, software, etc), pertinent policies and a proposed schedule of topics.
Wilkes University Curriculum Committee
COURSE ADDITION FORM

1. Course Title: Analytical Mechanics

2. Course Number: ___PHY 312________________________
   Coordinate with Registrar to insure course number is available

3. Total Course Credit Hours: ___3___
   Classroom Hours ___X___ Lab Hours _____ Other _____

4. Course Prerequisites: Senior Standing in Physics

5. Course Description (as proposed for the Bulletin): Course descriptions provide an overview of the topics covered. If the course is offered on a scheduled basis, i.e. every other year, or only during a set semester, note this in the description. Course descriptions should be no more than two to three sentences in length.

Insert Text Here...

   PHY 312 - The Principles of mechanics and advanced techniques for the solution of problems in mechanics. Three lecture per week.

6. Required Documentation:
   Proposed Syllabus Attach proposed syllabus immediately after this document. In some situations the official syllabus may contain information which is beyond the review needs of the Curriculum Committee (such as extensive rubrics, etc). It is permissible to attach an abbreviated syllabus. In general, syllabi (whether full or abbreviated) should contain the following information: Course Title, Course Number, Credit hours, Faculty Information (name contact information, office hours), Course Description, Course Outcomes or Objectives, Assessment (grading) informations, required texts (or other things such as tools, software, etc), pertinent policies and a proposed schedule of topics.
Wilkes University Curriculum Committee
COURSE ADDITION FORM

1. Course Title: Quantum Physics

2. Course Number: PHY 314
Coordinate with Registrar to insure course number is available

3. Total Course Credit Hours: Classroom Hours X Lab Hours Other

4. Course Prerequisites: Senior Standing in Physics

5. Course Description (as proposed for the Bulletin): Course descriptions provide an overview of the topics covered. If the course is offered on a scheduled basis, i.e. every other year, or only during a set semester, note this in the description. Course descriptions should be no more than two to three sentences in length.

Insert Text Here...

PHY 314 - Quantum Mechanics:
Schroedinger's wave equation and its application to the potential-well, the harmonic oscillator, and the hydrogen atom. Angular momentum, perturbation theory. Identical particles, paella's exclusion principle. Three hours per week.

6. Required Documentation:
   Proposed Syllabus Attach proposed syllabus immediately after this document. In some situations the official syllabus may contain information which is beyond the review needs of the Curriculum Committee (such as extensive rubrics, etc). It is permissible to attach an abbreviated syllabus. In general, syllabi (whether full or abbreviated) should contain the following information: Course Title, Course Number, Credit hours, Faculty Information (name contact information, office hours), Course Description, Course Outcomes or Objectives, Assessment (grading) informations, required texts (or other things such as tools, software, etc), pertinent policies and a proposed schedule of topics.
EE/ME/EMGT/PHY 391 Senior Projects Syllabus, Fall Semester**

Text: none
Class time: Tuesday 5-5:50 SLC 223 or SLC 166
Instructor: Dr. Rodney Ridley, Office: SLC226C Phone: 408-4824
(Also participating: Dr. Jeff Alves {Kirby Center for Entrepreneurship}, Mr. Gerald Ephault {Ben Franklin Technology Partners} and Faculty mentors from Engineering and Physics)

Objectives:
1. Provide students with an experience that will prepare them for work in the industrial setting.
2. Provide a capstone design experience in which students develop and manage a project with significant design, analysis, and management components.
3. Expose the students to various concepts in product development and entrepreneurship including items required for both writing a project plan and doing product market analysis. This will be done in conjunction with students from the Wilkes Entrepreneurism program.

Overview:
This course is intended to be an experience where students take charge and accomplish something that is challenging, brings together the things they have learned as undergraduates, and results in a project or product they can be proud of. We would also like the students to explore the commercial viability of their product or design.

The schedule below is tentative and assumes we get off to a good start, and project assignment actually takes place as scheduled. The schedule goal is to get all projects through the detailed design phase by the end of the semester (which will include a preliminary feasibility analysis done in conjunction with students from the Wilkes Entrepreneurism program). There will still be a significant amount required to be completed in Senior Projects 2: Building, Integration, Testing, any necessary corrections, Analysis, and Reports (which will include a product market analysis and gathering the info needed for a business plan both done in conjunction with students from the Wilkes Entrepreneurism program). That’s why we must complete the detailed design phase this semester. Note that the schedule is designed so that there are milestones and “gates” to help your team stay on track to complete your project in the time allotted. Also note that preliminary designs are due Oct 18th and should not preclude continued work on detailed design prior to that date. You should strive to have at least drafts of your products ready in time to be reviewed by the sponsoring company and your faculty mentor. The schedule is intended to force a fast pace that will have the deliverables of this course out of the way by the time final exams arrive. You will also need to work on a timing plan (due in your Proposal presentation) in conjunction with the Entrepreneurism student to make sure the scope of your plan is feasible.

Administration of senior projects is addressed in a separate document (attached). Students will all need to send weekly updates to the project managers who will submit a group update to me as well as the company representative and your faculty mentor. These will be graded, so we will review this in week one and two. The student project managers will need to formulate and track a project budget including both labor and other resource utilization.

**This syllabus was adapted from Senior Projects Syllabus by Dr. J. Gilmer, from Fall semester, 2009.
EE/ME/EGM/PHY 392 Senior Projects Syllabus, Spring Semester

Class time: Wednesday 5-5:50 SLC166
Office hours: Mon 11am-12pm; Tues & Wed 3pm-5pm; Also by Appointment
Instructor: Dr. Rodney S. Ridley Sr. Office: SLC226 Phone: 408-4824

Faculty Mentors: Dr. D. Carey Office: SLC214 Phone: 408-4807
Faculty Mentors: Dr. J. Gilmer Office: SLC220 Phone: 408-4805
Faculty Mentors: Prof. R Taylor Office: SLC235 Phone: 408-4819
Faculty Mentors: Dr. P. Kalim Office: SLC215 Phone: 408-4827
Faculty Mentors: Dr. A. Nazzal Office: SLC231 Phone: 408-3276
Faculty Mentors: Dr. T. Srinivasan Office: SLC221 Phone: 408-4811
Faculty Mentors: Dr. X. Zhang Office: SLC236 Phone: 408-4832

Contributing Faculty: Dr. J. Alves (Dean, Sidhu School of Business & Leadership)
Industrial Liaison: Mr. Gerald Ephault (Former Director of Ben Franklin Technology Partners)

Objectives:
1. Provide students with an experience that will prepare them for work in the industrial setting.
2. Provide a capstone design experience in which students develop and manage a project with significant design, analysis and management components.
3. Expose the students to various concepts in product development and entrepreneurship including items required for both writing a business plan and doing market analysis. This will be done in conjunction with students from the Wilkes Entrepreneurship program.

Overview:
This course is a continuation of EE/ME/EGM 391. It is intended to be an experience where students take charge and accomplish something that is challenging, brings together the things they have learned as undergraduates, and results in a project or product they can be proud of.

The schedule below is tentative. All projects have completed the “Detailed Design” phase but there may still be unresolved issues that need to be addressed as projects move into the “Do it / build it” phase. There are three major milestones this semester: 1) Official sign-off of detailed design document, 2) a “Demonstration” in March where each team will demonstrate its product and results to the rest of the class and 3) a Final Presentation and Report at the end of the semester when each team will present and demonstrate its project including the performance and analysis that followed the earlier demonstration. This final presentation will be open to guests, and scheduled for a Saturday late in April (tentatively Apr 28th). In addition, there are dates that will be used for “progress update report presentations”. At these sessions each team will give a short presentation of issues that have come up in the course of their project, followed by discussion. (This roughly corresponds to the kinds of status reports that a team would give in industry during a project.)

Administration of senior projects will continue as before. Student project managers will track budgets and both labor and other resource utilization. In the groups with Entrepreneurism
students, these students will work with team to provide a marketing plan, business plan and project planning and other business analysis as deemed appropriate for the project.

**Planned Schedule:**

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Topics covered</th>
<th>Graded</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18 Jan</td>
<td>Senior Projects Spring organizational meeting</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>25 Jan</td>
<td>Discussion of projects and issues (or possible guest lecture)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>01 Feb</td>
<td>Progress update report presentations #1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>08 Feb</td>
<td>Progress update report presentations #2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>15 Feb</td>
<td>Progress update report presentations #3</td>
<td>Individual project components should be complete</td>
</tr>
<tr>
<td>6</td>
<td>22 Feb</td>
<td>Discussion of projects and issues (or possible guest lecture)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>29 Feb</td>
<td>Discussion of projects and issues (or possible guest lecture)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>07 March</td>
<td>No Class - Spring 2012 Recess</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>14 March</td>
<td>Demonstration presentations #1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>21 March</td>
<td>Demonstration presentations #2</td>
<td>(Should have working models of Project)</td>
</tr>
<tr>
<td>11</td>
<td>28 March</td>
<td>Demonstration presentations #3</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>04 April</td>
<td>All Groups to meet individually with Instructor</td>
<td>(Project should be complete w/Analysis)</td>
</tr>
<tr>
<td>13</td>
<td>11 April</td>
<td>Discussion of projects and issues (or possible guest lecture)</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>18 April</td>
<td>Discussion of projects and issues (or possible guest lecture)</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>25 April</td>
<td>Prep for Final presentations &amp; SRS forms</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>28 April</td>
<td>Final presentations on Saturday (28 April 8am -1pm, SLC 101)</td>
<td></td>
</tr>
</tbody>
</table>

**Grading:**

- Demo presentation & draft report: 20%
- Update Presentation: 10%
- Administration / participation*: 10%
- Final presentation: 20%
- Final report: 30%
- Project: 10%

* includes ABET individual eval report and weekly progress reports

The grades from all work will be weighted as given in the above table, totaled, and converted into the Wilkes 4.0 scale grading system using the following conversion:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>93+:</td>
<td>4.0</td>
</tr>
<tr>
<td>88-92:</td>
<td>3.5</td>
</tr>
<tr>
<td>83-87:</td>
<td>3.0</td>
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<td>77-82:</td>
<td>2.5</td>
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<td>70-76:</td>
<td>2.0</td>
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<tr>
<td>65-69:</td>
<td>1.5</td>
</tr>
<tr>
<td>below 60:</td>
<td>0.0</td>
</tr>
</tbody>
</table>

All material will be graded on a basis of 0-100, with some graded material allowing for grades higher than 100 with bonus features (up to 10% extra) considered. All written work is expected to be neat and well presented and reports should be in IEEE or APS format and utilized the template issued in Senior Projects 1 (EE/ME/EGM 391). A penalty of up to 10% will be assessed for poor presentation on any written work. Particularly poorly written reports may well lose more than 10% if it is so difficult to read as to be less than understandable, if important elements are missing, or
such. Remember that “Administration/participation” includes weekly written progress reports (both individual and group).

A sufficiently bad written report will be “rejected” and returned with some general comments about the deficiencies. It will then be the team’s responsibility to first annotate the rejected report, correct the errors, have the corrected manuscript reviewed by the writing center, correct any deficiencies they may find, then submit the original, as annotated, a certification by the writing center, and the corrected copy, within a week. If the paper is still badly deficient or shows less than an earnest effort to correct it, a zero will be given for the report.

Since all of the projects are “different,” students are allowed, and even expected, to help each other and get help from any available “consultant.” When you receive help that makes a difference, acknowledge that help in your report. That’s part of professionalism.

Even though this is a team project, members of the project team will not necessarily receive the same grade. Since individual students will be assigned different tasks, I can grade differently based on how well those tasks have been carried out. The oral presentations also offer opportunity to discriminate in grading.

The Instructor’s grade along with (average) grades from other reviewers of the Project Update presentation, Project Demo Presentation, and Final Project presentations will comprise the components for presentation grading. Last year, presentations were graded by typically 5 to 9 faculty and Industrial Advisory Board participants. The Instructor’s grade on weekly progress reports and the written Final Project report will also be incorporated in grading. Weekly progress reports are typically initially graded by a graduate assistant(s) and the reviewed by the Instructor. This year the process will be similar and will likely include a project review grade from an industrial sponsor; that review will be a third major component of the grade. The process of deriving these grades from averaged data may need to be adjusted for any special circumstances.

Input from students in the course will NOT be used in grading; grading is an activity that should be in the hands of the faculty member(s). In generally, I will not be asking for or receiving grading information from student project managers. However, in the past there have been a lot of issues with some team members on projects who “slack-off” or do not “pull their own weight”. In cases where this occurs and it negatively affects the team, both the project faculty mentor and I should be consulted. If after a thorough investigation and significant evidence is found that a student is not adequately participating then I reserve the right to fail that individual student. This policy should not be view as a means to get back at a classmate but as a legitimate means to keep an individual or individuals from severely degrading the outcome of a project.

There has been an impression in the past that it is impossible to fail senior projects. That will not be the case. If a project fails, not all of the students assigned to it necessarily will fail. I will look carefully at what has happened, and make judgments accordingly. So far, I have no reason to anticipate a failure. In the past, projects that have failed are ones where the students did not build or analyze anything of value, and turned their final presentation into a mere general tutorial on some topic.

Each project team has been assigned a faculty mentor who is to be consulted on each phase of the project. The faculty mentor is there to help you and to ensure that every student on the team has a senior project worthy task(s) and overall experience. Each faculty mentor will be consulted for input on grading of the project to which they are assigned as well as the individual team member performance.

Reference: The Engineering Lab Reports Manual, August 2008
PHY 314 - QUANTUM MECHANICS

Catalog Description:
PHY 314 - Quantum Mechanics:
Schrodinger’s wave equation and its application to the potential-well, the harmonic
oscillator, and the hydrogen atom. Angular momentum, perturbation theory. Identical
particles, paella’s exclusion principle. Three hours per week.

Text Book:
Principles of Quantum Mechanics; H. Ohanian; Prentice Hall; First Edition

Prerequisites:
MTH211, MTH 212, Math 361, PHY 203, PHY 312

Coordinator:
Dr. John Orehotsky, Professor of Physics

Course Objectives:
A review and study of the elementary foundation of quantum mechanics. The abstract
formulation of quantum mechanics in terms of state vector and scalar operations and to
employ operator techniques for solving eigenvalues problems.

Topics:
1. Origin of Quantum Mechanics (3 hr)
2. Free Particle in Wave Mechanics (3 hr)
3. Particles in Potentials (3 hr)
4. Axiomatic formulation of Quantum Mechanics (3 hr)
5. State Evolution in Time (6 hr)
6. Harmonic Oscillator, Eigenvector and
   Eigenvalues of a General Hamiltonian (6 hr)
7. Particle in Three Dimensions and Angular Momentum (6 hr)
8. Spin and the Exclusion Principle. (6 hr)
9. Perturbation Theory (6 hr)

Grading Policy:
3 (Three) Exams per Semester

Final Grading Policy:
The final course grade will be determined as follows:
90-100% = 4.0; 85-89.9% = 3.5; 80-84.9% = 3.0; 75-79.9% = 2.5; 70-74.9% = 2.0
65-69.9% = 1.5; 60-64.9% = 1.0; < 60% = 0.0
PHY 311- THERMODYNAMICS

Catalog Description:
PHY 311 - The fundamental concepts and laws of thermodynamics. Carnot cycle, entropy and application. Kinetic theory, statistical mechanics, and application to fundamental systems. Three lecture per week

Text book:
Thermodynamics and an Introduction to Thermostatic, S. H. Callew; John Wiley, Second Edition

Coordinator:
Dr. John Orchotsky, Professor of Physics

Prerequisites:
MTH 211, PHY 201

Course Objectives:
To present the basic concepts and laws of thermodynamics with application considerations associated with the first and second laws and statistical distributions.

Topics:
1. Problems and Postulates (3 hr)
2. Conditions of Equilibrium (3 hr)
3. Formal relationships and sample systems. (3 hr)
4. Reversible Processes and Maximum work (6 hr)
5. Legendar Transformed Representations (6 hr)
6. Stability of Thermodynamics Systems (6 hr)
7. Properties of Materials (3 hr)
8. Statistical Mechanics (3 hr)
9. Entropy Representation (3 hr)
10. Canonical Formulation (Helmholtz Representation) (3 hr)
11. Entropy and Disorder (3 hr)

Grading Policy:
3 (Three) Exams per Semester

Final Grading Policy:
The final course grade will be determined as follows:

90-100% = 4.0; 85-89.9% = 3.5; 80-84.9% = 3.0; 75-79.9% = 2.5; 70-74.9% = 2.0
65-69.9% = 1.5; 60-64.9% = 1.0; < 60% = 0.0
PHY 312 - ANALYTICAL MECHANICS

Catalog Description:
PHY 312 - The Principles of mechanics and advanced techniques for the solution of problems in mechanics. Three lecture per week.

Text Book:

Coordinator:
Dr. John Orchotsky, Professor of Physics

Prerequisites:
MTH211, MTH 212, PHY 201, 202

Course objectives:
To provide students with a foundation in the principles of mechanics and in advanced techniques for the solution of problems in mechanics.

Topics:

1. Lagrangian and Hamiltonian operators (3 hr)
2. Small Oscillation Theory and eigenvalue problems (3 hr)
3. Particle motion in electromagnetic field (3 hr)
4. Introduction to Newtonian Mechanics (3 hr)
5. One dimensional particle dynamics (3 hr)
6. Harmonic Oscillators (3 hr)
7. Oscillating Systems (3 hr)
8. Vectors Operators and Transformations (3 hr)
9. Central Force (3 hr)
10. System of Particles: Conservation Laws and Collisions (4 hr)
11. Non-inertia Coordinate Systems (5 hr)
12. Lagrangian and Hamiltonian Dynamics (6 hr)

Grading Policy:
3 (Three) Exams per Semester

Final Grading Policy:
The final course grade will be determined as follows:

90-100% = 4.0; 85-89.9% = 3.5; 80-84.9% = 3.0; 75-79.9% = 2.5; 70-74.9% = 2.0
65-69.9% = 1.5; 60-64.9% = 1.0; < 60% = 0.0