UNIVERSITY OF KENTUCKY
APPLICATION FOR CHANGE IN EXISTING COURSE: MAJOR & MINOR

1. Submitted by College of A & S
   Department/Division offering course PHYSICS & ASTRONOMY
   Date Feb. 2, 2005

2. Changes proposed:
   (a) Present prefix & number
   PHY 535

   Proposed prefix & number
   Same

   (b) Present Title
   Experimental Physics: Atomic and Nuclear

   New Title
   Experimental Physics: Advanced Physics Laboratory

   (c) If course title is changed and exceeds 24 characters (Including spaces), include a sensible title (not to exceed 24 characters) for use on transcripts: Advanced Physics Lab.

   (d) Present credits:
   2

   Proposed credits:
   2 may be repeated up to 4

   (e) Current lecture: laboratory ratio
   0 : 2

   Proposed:
   0 : 2

   (f) Effective Date of Change: (Semester & Year)
   S 2006

3. To be Cross-listed as:
   Prefix and Number
   Signature: Department Chair

4. Proposed change in Bulletin description:
   (a) Present description (including prerequisites)
   An advanced laboratory course in which students will study atoms and nuclei with the goals of both illustrating the quantum mechanical behavior of these systems and learning modern laboratory techniques. Measurements include: the charge and mass of the electron, Planck's constant, interference of x-rays and matter waves, Bragg and Compton scattering, and nuclear decay correlations. Four hours of laboratory per week. Prereq: PHY 361, PHY 335

   (b) New description:
   An advanced laboratory course covering topics in atomic, solid state, and nuclear physics, geometrical and wave optics, and principles and techniques of spectroscopy. May be repeated to a maximum of 4 credits.

   (c) Prerequisite(s) for course as changed:
   PHY 335, PHY 361

5. What has prompted this proposal? We are effectively merging PHY 530 and PHY 535. This merger is necessitated because enrollment in each course is low. However, enough students enroll in one or the other to populate a single lab course. Students will take the course once for the atomic/solid state/nuclear experiments and once for the optics/spectroscopy experiments. Right now PHY 535 (see 4a above) is required for the major but PHY 530 (optics and spectroscopy) is an option. With the proposed change the requirements will effectively not change. Students will take PHY 535 either once or twice.

6. If there are to be significant changes in the content or teaching objectives of this course, indicate changes:
   Both sets of experiments from the original laboratory courses can be supervised simultaneously by one professor. Since the labs are adjacent and will be connected, this is feasible. Students will concentrate on a set of experiments, determined by the instructor, each time they take the course (since they may take it once or twice).

7. What other departments could be affected by the proposed change? Radiation Physics - no net effect

8. Is this course applicable to the requirements for at least one degree or certificate at the University of Kentucky?
   ☒ Yes ☐ No

9. Will changing this course change the degree requirements in one or more programs?*
   If Yes, please attach an explanation of the change.* We are removing PHY 530 from the lab courses currently being offered. PHY 535 will be a more extensive lab course offering topics that both PHY 530 and PHY 535 currently offer. A student majoring in Physics may take PHY 535 twice. The requirement for Radiation Physics will remain unchanged since students will be able to take PHY 535 as before for the atomic and nuclear experiments.
   ☒ Yes ☐ No

10. Is this course currently included in the University Studies Program?
    If yes, please attach correspondence indicating concurrence of the University Studies Committee.
    ☐ Yes ☒ No

*NOTE: Approval of this change will constitute approval of the program change unless other program modifications are proposed.
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11. If the course is a 100-200 level course, please submit evidence (e.g., correspondence) that the Community College System has been consulted. N/A

If the course is 400G or 500 level, include syllabi or course statement showing differentiation for undergraduate and graduate students in assignments, grading criteria, and grading scales. ☒ Check here if 400G-500.

12. Is this a minor change?
   ☐ Yes ☒ No
   (NOTE: See the description on this form of what constitutes a minor change. Minor changes are sent directly from the Dean of the College to the Chair of the Senate Council. If the latter deems the change not to be minor, it will be sent to the appropriate Council for normal processing.)

13. Within the Department, who should be consulted for further information on the proposed course change?

Name: Dr. Suketu Bhavsar (bhavsar@pa.uky.edu)    Phone Extension: 7-1697

Signatures of Approval:

[Signature]
Department Chair
Prof. Joseph E. Brill
Dean of the College

[Signature]
Undergraduate Council

[Signature]
Graduate Council

[Signature]
Academic Council for the Medical Center

[Signature]
Senate Council

2-1-05
Date
APR 0 8 2005
Date of Notice to the Faculty
MAR 0 1 2005
Date
Date
Date

Date of Notice to University Senate

**If applicable, as provided by the Rules of the University Senate.

ACTION OTHER THAN APPROVAL

**********

The Minor Change route for courses is provided as a mechanism to make changes in existing courses and is limited to one or more of the following:

a. change in number within the same hundred series;
b. editorial change in description which does not imply change in content or emphasis;
c. editorial change in title which does not imply change in content or emphasis;
d. change in prerequisite which does not imply change in content or emphasis;
e. cross-listing of courses under conditions set forth in item 3.0;
f. correction of typographical errors. [University Senate Rules, Section III - 3.1]
The Learning Objectives of PHY 535 include:

- To gain valuable first-hand experience working in a laboratory setting by repeating several ‘classic’ physics experiments, many of which were instrumental in defining our modern, quantum mechanical picture of atomic systems,

- To develop methods for evaluating the uncertainties associated with laboratory measurements, and for determining optimized parametric representations of measured data, and,

- To learn methods for recording and reporting – in both written and oral form – the results of laboratory measurements.
PHYSICS 535
ATOMIC AND NUCLEAR LAB
SPRING 2005

Instructor: Prof. Michael A. Kovash
Office: CP-371, 257-1150
Office Hours: Thursday, 9-11
electronic mail: kovash@pa.uky.edu

GOALS

Physics 535 is an upper-level laboratory course emphasizing projects which display most clearly the quantum-mechanical basis for our modern understanding of the structure of matter. In this largely self-directed course, students will learn laboratory skills and gain valuable practice using statistical methods of data analysis.

The specific goals of PHY535 include:

- To gain first-hand experience working in a laboratory setting by completing several ‘classic’ physics experiments, many of which were instrumental in defining our modern picture of atomic and nuclear systems,
- To learn numerical methods for evaluating the uncertainties associated with laboratory measurements, and for determining optimized parametric representations of measured data, and,
- To learn effective methods for recording and reporting the results of laboratory measurements.

ORGANIZATION

The course is organized as follows: The first 2-hour class of the semester is devoted to a review of data analysis techniques, and includes a discussion of the safe handling of radioactive materials. Students will be given their schedule of experimental projects for the semester, and the lab projects will be introduced. All of the lab manuals will be distributed on CDs.

Lab work will begin on the second meeting of the class, January 18, and continue throughout the
semester. *No lectures will be given after the lab work begins.* Students are expected to complete their reading assignments before starting each of their lab projects. To ensure that each student is adequately prepared to begin their lab work, a pre-lab quiz will be given before each project is started. Lab notebooks and lab reports will be collected for grading immediately after each experiment is completed. The lab notebook will be returned to the student within 24 hours of its submission. The lab report will be retained until the end of the semester, but report grades will be distributed as they become available.

**EXPERIMENTAL PROJECTS**

The experiments which are available this semester are listed below.

*Atomic Physics*

A1 Millikan Oil Drop: e
A2 Electron Magnetic Deflection: e/m
A3 Photoelectric Effect: h/e
A4 Franck-Hertz: Hg Excited State
A5 X-Ray Scattering and Absorption: Cu X-Rays, h, Moseley's Law
A6 Electron Spin Resonance: g-factor

*Nuclear Physics*

N1 Gamma-Ray Absorption: Attenuation Coefficients, Counting Statistics
N2 Gamma-Ray Spectroscopy: Energy Calibration, Resolution, Efficiency
N3 Alpha-Particle Spectroscopy: Bragg Curve, Energy Straggling
N4 Rutherford Scattering: Angular Distribution
N5 Compton Scattering: Kinematics, Angular Distribution, Recoil Energy
N6 $^{60}$Co Decay: $\gamma \gamma$ Correlation

Each student will be assigned a letter from A thru J. The detailed schedule of lab assignments for each letter/student is given in the table below. Notice that all experiments except N5 and N6 are assigned a total of 4 lab periods. Because of their greater complexity, both N5 and N6 require 8 periods to complete.

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<thead>
<tr>
<th>Jan.</th>
<th>18</th>
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<th>27</th>
<th>N2</th>
<th>A1</th>
<th>A3</th>
<th>A2</th>
<th>A4</th>
<th>A6</th>
<th>N3</th>
<th>N4</th>
<th>N1</th>
<th>N2</th>
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</thead>
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<tr>
<td>Feb.</td>
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<td>3</td>
<td>8</td>
<td>10</td>
<td>N6</td>
<td>N2</td>
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<td>A3</td>
<td>A2</td>
<td>A4</td>
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<td>A6</td>
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<tr>
<td>Feb.</td>
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<td>24</td>
<td>N6</td>
<td>N5</td>
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The digitized manual for each experimental project contains a relatively complete and self-contained reading assignment. Many of the reading are from the textbook *Experiments in Modern Physics*, by A.C. Melissinos, but other relevant readings are from apparatus manuals as well as sections from other textbooks. Each listed resource is designated either as a primary (P) or secondary (S) reading on the ToDo list for the project. (The ToDo list is located at the head of each project manual.) All of the primary reading assignments must be read and understood before lab work can commence. The secondary readings are available as needed to provide the student a greater understanding of the physics content of the projects.

The ToDo sheet in the manual lists activities which should be done in the course of completing the lab. This includes instructions on the set-up of the experiment, the data which should be collected, and the kind of analysis that should be performed on these data to yield an interpretable result. A set of equipment manuals is also included in the ToDo sheet, as is a set of questions which need to be answered within the lab report.

**PRE-LAB QUIZZES**

Each Friday morning before a new lab is started a time window will open. During this window each student must successfully complete a pre-lab quiz on their upcoming project. The quiz will consist of five randomly selected questions taken from the texts of the primary reading list for the experiment. Students may complete their quiz while searching for the answers in their reading assignment; the quiz is Open Book, but everyone must work alone on their quiz. (Since the questions are randomly selected, each student will get a different quiz.)

<table>
<thead>
<tr>
<th>Quiz Attempt</th>
<th>Window Opens</th>
<th>Window Closes</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Friday 8 AM</td>
<td>Monday 11 PM</td>
</tr>
<tr>
<td>2</td>
<td>Sunday 8 AM</td>
<td>Monday 11 PM</td>
</tr>
</tbody>
</table>

In order to pass the quiz, students must score at least 4 out of 5 correct answers. A student who fails the quiz on his first attempt must first wait for a new window to open, and then take a new quiz. Students who cannot pass the quiz on either attempt may begin their lab work on schedule, but will suffer the following serious penalty: the numerical grade they receive on their lab report will be multiplied by the fractional score they have earned on their pre-lab quizzes. For example, a student who scores 3 on quiz 1, 3 on quiz 2, and 85 on their lab report will receive a final project grade of

\[
\frac{85 \cdot 3 + 3}{5 + 5} = 51
\]

The scores of students who pass the quiz on either their first or second attempt will not be renormalized, and indeed the quiz score will have no explicit effect on their grade.
Students may access the pre-lab quizzes on the UK BlackBoard system from the Physics Department web page (www.pa.uky.edu). From there, follow the Courses link to PHY535. Alternately, students can proceed directly to the BlackBoard site at http://elearning.uky.edu. In either case, students will need to know both their AD account name and password to access the PHY535 pages on BlackBoard.

Once in the BlackBoard system, proceed to PHY535 and to the Assignments page. There you will find all quizzes whose time window is open, arranged in folders. For example, on Monday morning you will find listings for Quiz N4-a and Quiz N4-b. Select a if you are doing experiment N4 and taking the quiz for the first time; select b if this is your second attempt at this quiz. Note that you will have to use the password supplied on the first day of class to access your quiz. The same password works for both a and b versions of the quiz. Take note: once you begin, BlackBoard will allow you only 4 hours to complete the quiz.

NOTEBOOKS & REPORTS

Everyone is required to purchase a bound laboratory notebook for use throughout the term. The book must contain gridded paper on which graphs can be easily constructed. No carbon paper is needed. This book will become a record of your preparations, methodologies, observations, graphs, and all other lab work. Throughout the semester we will emphasize the appropriate construction of the notebook, and how it is used to maintain an effective real-time record of your work in the lab.

The instructor will regularly check the data you have collected, as recorded in your lab notebook. In order for a data set you have collected to be included in the final report it must be verified by the instructor at the time in which it was collected. Do not neglect to have the instructor check off each of your data sets, including data stored on disk!

Students will submit their lab notebook for grading after each experiment. A new experiment can be started only after the graded lab notebook has been returned, which will be within 24 hours of its submission.

We also will emphasize methods of writing a concise, coherent, and informative stand-alone lab report. (Additional information on writing a lab report and maintaining a lab notebook will be supplied at the first class meeting.) These reports, along with the lab notebook, will be submitted for grading at the conclusion of each experiment. For example, the first experiment concludes on Thursday, 27 January, so the first lab report will be due the following Monday, 31 January, by noon. Reports may be submitted in the Physics Department office, or directly to the instructor.

ATTENDANCE

Students who need additional time to work in the lab beyond the two weekly 2-hour lab periods may
also attend optional lab periods. The schedule for these additional lab-open times is given below.

<table>
<thead>
<tr>
<th>Time</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:00</td>
<td>Optional</td>
<td>Mandatory</td>
<td>Optional</td>
<td>Mandatory</td>
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<tr>
<td>3:00</td>
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<tr>
<td>4:00</td>
<td>Optional</td>
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</tbody>
</table>

Students are required to attend the usual Tuesday and Thursday lab sessions even though they may also be attending one or more of the optional lab sessions. The only exception to this requirement is for students whose data set has been verified to be complete by the professor (not by the lab assistant).

Even with optional sessions, occasionally a student falls behind and is unable to complete the lab work in the allotted time. This is a potentially serious problem, and students who become ill or just get 'stuck' on a lab project should discuss this with the instructor in a timely manner.

Take note: All data to be included in the final lab report must be verified by the professor during the lab period in which it is collected. This is also true for the optional lab periods, which are staffed by the lab assistant. In order for data collected during an optional period to be used in a lab report, the professor must be found and must give his approval to the data – just as in a regularly scheduled lab period.

**FINAL GRADES**

There will be no mid-term or final exam in this course; each student’s accumulated score on their lab work will be the basis for their final grade assignment. The final Project Grade for each of the 7 experiments will be the weighted average of the score for the lab notebook (1/3), and for the lab report (2/3). The Project Grade for experiments N5 and N6 will carry double-weighting, since these are 8-period projects. Students with unexcused absences may be explicitly penalized when final grades are assigned. Note that an ‘I’ grade in this course will only be given in cases where a student is unable to complete the lab work because of illness or similarly debilitating circumstance. Other students will receive scores of zero for all uncompleted work, and a final course grade will be assigned.

**CHEATING**

It is an unfortunate fact that a few students find it convenient to appropriate the work of others into their own lab notebooks and reports. Let’s be very clear about this: A student who falsifies data or uses the work of others – including, but not limited to, relevant work found on the internet without proper attribution is guilty of cheating. The University rules on how to handle cheaters
are unequivocal and very severe. Do not under any circumstances ‘borrow’ either the data or the text from another source, including other student lab reports or textbooks and manuals, without making it very clear that this is what you are doing. You should collect your own data, maintain your own lab notebook, perform your own analysis, and write your own report. Unfortunately one or more PHY 535 students are found guilty of this crime every other year or so. Don’t be a victim this semester!

COURSE EVALUATIONS

Course evaluations are a mandatory component of our Department’s instructional program. An on-line course evaluation system was developed to allow each student ample time to evaluate each component of the course and instructor, thus providing the Department with numerical scores and detailed commentary, while minimizing the loss of instructional time in the classroom. The evaluation window for Spring 2005 will open on Monday, 11 April 2005 and close on Wednesday 27 April 2005. To access the system during this time, simply go the Department of Physics web page at www.pa.uky.edu and click on the link for Course Evaluations; then follow the instructions. You will need to use your student ID number to log into the system, and this will also allow the Department to monitor who has filled out evaluations. However, when you log-in you will be assigned a random number that will keep all your comments and scores anonymous.
PHYSICS 535
ADVANCED PHYSICS LAB
SPRING 2006

Instructor: Prof. Michael A. Kovash
Office: CP-371, 257-1150
Office Hours: Thursday, 9-11
electronic mail: kovash@pa.uky.edu

GOALS

Physics 535 is an upper-level laboratory course in which a variety of projects spanning the fields of optics, spectroscopy, and quantum physics will be investigated. In this largely self-directed course, students will learn laboratory skills and gain valuable practice using statistical methods of data analysis.

The specific goals of PHY535 include:

• To gain first-hand experience working in a laboratory setting by completing several 'classic' physics experiments, many of which were instrumental in defining our modern picture of atomic and nuclear systems,

• To learn numerical methods for evaluating the uncertainties associated with laboratory measurements, and for determining optimized parametric representations of measured data, and,

• To learn effective methods for recording and reporting the results of laboratory measurements.

ORGANIZATION

The course is organized as follows: The first 2-hour class of the semester is devoted to a review of data analysis techniques, and includes a discussion of the safe handling of radioactive materials. Students will be given their schedule of experimental projects for the semester, and the lab projects will be introduced. All of the lab manuals will be distributed on CDs.

Lab work will begin on the second meeting of the class, January 18, and continue throughout the
semester. No lectures will be given after the lab work begins. Students are expected to complete their reading assignments before starting each of their lab projects. To ensure that each student is adequately prepared to begin their lab work, a pre-lab quiz will be given before each project is started. Lab notebooks and lab reports will be collected for grading immediately after each experiment is completed. The lab notebook will be returned to the student within 24 hours of its submission. The lab report will be retained until the end of the semester, but report grades will be distributed as they become available.

EXPERIMENTAL PROJECTS

Physics 535 contains experimental projects grouped into two broad categories: Quantum Physics, and Optics and Spectroscopy. Every student will be assigned projects from these categories based upon his own academic needs, and the degree requirements of his Department, noting that 535 may be repeated once for credit. For example, a BA physics major taking 535 for either the first or second time will be assigned projects from both the Quantum Physics and the Optics and Spectroscopy areas. In contrast, a BS physics major must complete the Quantum Physics unit, which he can do either his first or second time through the course. (BS majors who are certain they will repeat 535 will do the Optics unit their first time through the course.) Any student repeating 535 will be assigned projects they have not previously completed.

The experiments which are available this semester are listed below.
Atomic Physics
A1 Millikan Oil Drop: e
A2 Electron Magnetic Deflection: e/m
A3 Photoelectric Effect: h/e
A4 Franck-Hertz: Hg Excited State
A5 X-Ray Scattering and Absorption; Cu X-Rays, h, Moseley’s Law
A6 Electron Spin Resonance: g-factor

Nuclear Physics
N1 Gamma-Ray Absorption: Attenuation Coefficients, Counting Statistics
N2 Gamma-Ray Spectroscopy: Energy Calibration, Resolution, Efficiency
N3 Alpha-Particle Spectroscopy: Bragg Curve, Energy Straggling
N4 Rutherford Scattering: Angular Distribution
N5 Compton Scattering: Kinematics, Angular Distribution, Recoil Energy
N6 $^{60}$Co Decay: $\gamma\gamma$ Correlation

Optics and Spectroscopy
Optics  Optical Dispersion
Optics  Lenses and Aberrations
Optics  Multiple-Slit Interference
Optics  Polarization
Optics  Microwave Optics
Optics  The Michelson Interferometer
Optics  The Fabry-Perot Interferometer
Spectroscopy  The Prism Spectrometer
Spectroscopy  The Grating Spectrometer

Each student will be assigned a letter from A thru J. The detailed schedule of lab assignments for each letter/student is given in the table below. Notice that all experiments except N5 and N6 are assigned a total of 4 lab periods. Because of their greater complexity, both N5 and N6 require 8 periods to complete. In the future, students will also be assigned projects in the Optics and Spectroscopy categories.

<table>
<thead>
<tr>
<th>Jan.</th>
<th>18</th>
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<th>25</th>
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</table>

Graduate students enrolled in PHY 535 will complete the same number of laboratory
projects as undergraduate students. However, the instructor will suggest additional work for graduate students to do in each of their projects. This may take the form of requiring additional measurements or more sophisticated data analysis, or both.

MANUALS

The digitized manual for each experimental project contains a relatively complete and self-contained reading assignment. Many of the reading are from the textbook *Experiments in Modern Physics*, by A.C. Melissinos, but other relevant readings are from apparatus manuals as well as sections from other textbooks. Each listed resource is designated either as a primary (P) or secondary (S) reading on the ToDo list for the project. (The ToDo list is located at the head of each project manual.) All of the primary reading assignments must be read and understood before lab work can commence. The secondary readings are available as needed to provide the student a greater understanding of the physics content of the projects.

The ToDo sheet in the manual lists activities which should be done in the course of completing the lab. This includes instructions on the set-up of the experiment, the data which should be collected, and the kind of analysis that should be performed on these data to yield an interpretable result. A set of equipment manuals is also included in the ToDo sheet, as is a set of questions which need to be answered within the lab report.

PRE-LAB QUIZZES

Each Friday morning before a new lab is started a time window will open. During this window each student must successfully complete a pre-lab quiz on their upcoming project. The quiz will consist of five randomly selected questions taken from the texts of the primary reading list for the experiment. Students may complete their quiz while search for the answers in their reading assignment; the quiz is Open Book, but everyone must work alone on their quiz. (Since the questions are randomly selected, each student will get a different quiz.)

<table>
<thead>
<tr>
<th>Quiz Attempt</th>
<th>Window Opens</th>
<th>Window Closes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Friday 8 AM</td>
<td>Monday 11 PM</td>
</tr>
<tr>
<td>2</td>
<td>Sunday 8 AM</td>
<td>Monday 11 PM</td>
</tr>
</tbody>
</table>

In order to pass the quiz, students must score at least 4 out of 5 correct answers. A student who fails the quiz on his first attempt must first wait for a new window to open, and then take a new quiz. Students who cannot pass the quiz on either attempt may begin their lab work on schedule, but will suffer the following serious penalty: the numerical grade they receive on their lab report will be multiplied by the fractional score they have earned on their pre-lab quizzes. For example, a student...
who scores 3 on quiz 1, 3 on quiz 2, and 85 on their lab report will receive a final project grade of

$$\frac{3 + 3}{5 + 5} = 51$$

The scores of students who pass the quiz on either their first or second attempt will not be renormalized, and indeed the quiz score will have no explicit effect on their grade.

Students may access the pre-lab quizzes on the UK BlackBoard system from the Physics Department web page (www.pa.uky.edu). From there, follow the Courses link to PHY535. Alternately, students can proceed directly to the BlackBoard site at http://clearning.uky.edu. In either case, students will need to know both their AD account name and password to access the PHY535 pages on BlackBoard.

Once in the BlackBoard system, proceed to PHY535 and to the Assignments page. There you will find all quizzes whose time window is open, arranged in folders. For example, on Monday morning you will find listings for Quiz N4-a and Quiz N4-b. Select a if you are doing experiment N4 and taking the quiz for the first time; select b if this is your second attempt at this quiz. Note that you will have to use the password supplied on the first day of class to access your quiz. The same password works for both a and b versions of the quiz. Take note: once you begin, BlackBoard will allow you only 4 hours to complete the quiz.

**NOTEBOOKS & REPORTS**

Everyone is required to purchase a bound laboratory notebook for use throughout the term. (Note: Spiral notebooks with tear-out sheets are *not* satisfactory.) The book must contain gridded paper on which graphs can be easily constructed. No carbon paper is needed. This book will become a record of your preparations, methodologies, observations, graphs, and all other lab work. Throughout the semester we will emphasize the appropriate construction of the notebook, and how it is used to maintain an effective real-time record of your work in the lab.

The instructor will regularly check the data you have collected, as recorded in your lab notebook. *In order for a data set you have collected to be included in the final report it must be verified by the instructor at the time in which it was collected. Do not neglect to have the instructor check off each of your data sets, including data stored on disk!*

Students will submit their lab notebook for grading after each experiment. A new experiment can be started only after the graded lab notebook has been returned, which will be within 24 hours of its submission.

We also will emphasize methods of writing a concise, coherent, and informative stand-alone lab report. (Additional information on writing a lab report and maintaining a lab notebook will be supplied at the first class meeting.) These reports, along with the lab notebook, will be submitted
for grading at the conclusion of each experiment. For example, the first experiment concludes on Thursday, 27 January, so the first lab report will be due the following Monday, 31 January, by noon. Reports may be submitted in the Physics Department office, or directly to the instructor.

ATTENDANCE

Students who need additional time to work in the lab beyond the two weekly 2-hour lab periods may also attend optional lab periods. The schedule for these additional lab-open times is given below.

<table>
<thead>
<tr>
<th>Time</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:00</td>
<td>Optional</td>
<td>Mandatory</td>
<td>Optional</td>
<td>Mandatory</td>
<td>Optional</td>
</tr>
<tr>
<td>3:00</td>
<td>Optional</td>
<td>Mandatory</td>
<td>Optional</td>
<td>Mandatory</td>
<td></td>
</tr>
<tr>
<td>4:00</td>
<td>Optional</td>
<td>Optional</td>
<td>Optional</td>
<td>Optional</td>
<td></td>
</tr>
</tbody>
</table>

Students are required to attend the usual Tuesday and Thursday lab sessions even though they may also be attending one or more of the optional lab sessions. The only exception to this requirement is for students whose data set has been verified to be complete by the professor (not by the lab assistant).

Even with optional sessions, occasionally a student falls behind and is unable to complete the lab work in the allotted time. This is a potentially serious problem, and students who become ill or just get ‘stuck’ on a lab project should discuss this with the instructor in a timely manner.

Take note: All data to be included in the final lab report must be verified by the professor during the lab period in which it is collected. This is also true for the optional lab periods, which are staffed by the lab assistant. In order for data collected during an optional period to be used in a lab report, the professor must be found and must give his approval to the data—just as in a regularly scheduled lab period.

FINAL GRADES

There will be no mid-term or final exam in this course; each student’s accumulated score on their lab work will be the basis for their final grade assignment. The final Project Grade for each of the 7 experiments will be the weighted average of the score for the lab notebook (1/3), and for the lab report (2/3). The Project Grade for experiments N5 and N6 will carry double-weighting, since these are 8-period projects. Students with unexcused absences may be explicitly penalized when final grades are assigned. Note that an ‘F’ grade in this course will only be given in cases where a student is unable to complete the lab work because of illness or similarly debilitating circumstance. Other students will receive scores of zero for all uncompleted work, and a final course grade will be assigned.
CHEATING

It is an unfortunate fact that a few students find it convenient to appropriate the work of others into their own lab notebooks and reports. Let’s be very clear about this: A student who falsifies data or uses the work of others— including, but not limited to, relevant work found on the internet without proper attribution is guilty of cheating. The University rules on how to handle cheaters are unequivocal and very severe. Do not under any circumstances ‘borrow’ either the data or the text from another source, including other student lab reports or textbooks and manuals, without making it very clear that this is what you are doing. You should collect your own data, maintain your own lab notebook, perform your own analysis, and write your own report. Unfortunately one or more PHY 535 students are found guilty of this crime every other year or so. Don’t be a victim this semester!

COURSE EVALUATIONS

Course evaluations are a mandatory component of our Department’s instructional program. An on-line course evaluation system was developed to allow each student ample time to evaluate each component of the course and instructor, thus providing the Department with numerical scores and detailed commentary, while minimizing the loss of instructional time in the classroom. The evaluation window for Spring 2005 will open on Monday, 11 April 2005 and close on Wednesday 27 April 2005. To access the system during this time, simply go the Department of Physics web page at www.pa.uky.edu and click on the link for Course Evaluations; then follow the instructions. You will need to use your student ID number to log into the system, and this will also allow the Department to monitor who has filled out evaluations. However, when you log-in you will be assigned a random number that will keep all your comments and scores anonymous.
INSTRUCTIONS: This completed form will accompany the course application to the Graduate/Undergraduate Council(s) in order to avoid needless repetition of investigation. The following questions are included as an outline only. Be as specific and as brief as possible. If the investigation was routine, please indicate this. The term “course” is used to indicate one course, a series of courses or a program, whichever is in order. Return the form to Leonidas Bachas, Associate Dean, 275 Patterson Office Tower for forwarding to the Council(s). ATTACH SUPPLEMENT IF NEEDED.

1. List any modifications made in the course proposal as submitted originally and why.

   - none

2. If no modifications were made, review considerations that arose during the investigation and the resolutions.

   - none

3. List contacts with program units on the proposal and the considerations discussed therein.

   - none

4. Additional information as needed.

   - na

5. A&S Area Investigator Recommendation:

   [Signature]

   APPROVE, APPROVE WITH RESERVATION, OR DISAPPROVE

6. A&S Council Recommendation:

   [Signature]

   APPROVE, APPROVE WITH RESERVATION, OR DISAPPROVE

7. A&S Council Investigator, Dave Moecher

   Date: 04-15-05

File: InvestigatorRpt