East Carolina University

Tomorrow starts here.

Graduate Curriculum and Program Development Manual
University Curriculum Committee • 2009-2010
Graduate Curriculum and Program Development Manual

Graduate Curriculum Committee
2009 - 2010

Revised 03-04-10
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Part Two: New Program Development
  Academic program development procedures as included in the East Carolina University
  Faculty Manual are under revision. Current processes and procedures are accessible at
  http://www.ecu.edu/cs-acad/acadprograms/PoliciesForms.cfm or you may contact the Office
  of Academic Programs at 252-328-5358.
Part One: Curriculum Development
OVERVIEW OF GRADUATE CURRICULUM DEVELOPMENT

Curriculum development is a faculty responsibility. Proposals for new courses and revisions to existing courses originate within the various schools and departments and within interdepartmental committees, and are approved by the unit faculty in accordance with unit code provisions. After approval by the academic unit faculty, the curriculum package needs the approval of the college or school curriculum committee as appropriate, prior to submission to the Graduate Curriculum Committee (GCC) for consideration. Changes to courses affecting any teacher education program require approval by the Council for Teacher Education (CTE).

Role of the Resource Person
Each college/school/department has an appointed resource person. This individual is an independent and unbiased facilitator of the curriculum process. This role may include guiding the development, organization, and submission of the curriculum proposal package. The resource person is not an additional step in the curriculum approval process.

Overview of the Curricular Revision Process
1) With guidance from the college/school resource person, the faculty member prepares a proposal package that includes:
   a. explanatory memorandum
   b. course proposal(s)
   c. marked catalog copy
   d. copy of e-mail verification from the Office of the Registrar for new course number(s)
   e. copy of e-mail verification from the Office of Academic Programs for new prefixes, and
   f. documentation that units directly or indirectly affected by the curriculum request have been notified

2) Approval by the unit curriculum committee and unit administrator

3) Approval of college/school curriculum committee as appropriate

4) Approval of the CTE, if curriculum package includes revisions to any course that affects any teacher education program

5) Two weeks prior to the requested GCC consideration, the resource person submits the complete curriculum package (including a scanned copy of the Signature Form) to the GCC mailbox (gcc@ecu.edu).

6) Faculty member(s) and resource person submitting the proposal should attend the GCC meeting at which the proposal will be considered.

7) Revisions requested by the GCC must be submitted within one week and approved before the proposal will be forwarded to the Graduate School Administrative Board (GSAB).

8) GSAB gives final approval of all proposals, based on the recommendation of the GCC. Originating department maintains archived copies of all approved curricular materials. Signature forms are archived within the Office of Academic Programs.

9) Faculty consult GCC Web site for notification that their proposal has received all necessary levels of approval.
GRADUATE CURRICULUM COMMITTEE COURSE SUBMISSION PROCEDURES

The Graduate Curriculum Committee has an e-mail account (gcc@ecu.edu) to which all submissions of curriculum forms, proposals, and memoranda of request are made. Inquiries about the guidelines for submitting curriculum packages may also be sent to gcc@ecu.edu.

All materials for review and action by the committee must be sent to the committee chair at gcc@ecu.edu as an e-mail attachment. The entire package must be complete before it can be considered by the committee. All materials for consideration must be received by 5:00 p.m., two weeks prior to the scheduled committee meeting. The electronic files will be posted to the committee Web site for review by all interested parties.

Before Submitting to the GCC:

Before the Graduate Curriculum Committee will consider a curriculum revision package, the proposers must complete each of the following steps:

1) Secure approval of the college/school/dept curriculum committee for the requested curriculum changes. The college/school/dept curriculum committee chair must sign a signature form for changes being submitted (one form per curriculum package).

2) Secure approval from the Council for Teacher Education (CTE) if the curricula revision has any impact upon any course required for a teacher education program. A signature from the chair of CTE is required on the signature form.

3) Secure approval from the Service-Learning Advisory Committee (SLAC) if applicable.

4) Secure e-mail verification from the Office of the Registrar for new or unbanked course numbers.

5) Secure e-mail verification from the Office of Academic Programs for proposed new prefixes.

The signature form and e-mails should be included as part of the curriculum revision package submitted electronically to the GCC.

GCC Submission Process:

The process for submitting curriculum revision packages to the GCC is as follows:

1) Prepare a complete curriculum revision package (described below). Each electronic document should be prepared in Microsoft Word format (.doc). Save each required e-mail in Microsoft Outlook format (.msg). Do not send any part of the package until it is fully completed.

2) Fill out one signature form and one memorandum of request for the entire curriculum package, collecting all of the appropriate signatures (see previous section). The completed signature form should be in a (.pdf) format and must be submitted with the curriculum package electronically in order for the package to be considered for a place on the agenda.

3) Attach each electronic item in the curriculum revision package to an e-mail and send to: gcc@ecu.edu. Materials must be submitted electronically by 5:00 p.m., two weeks prior to the
scheduled GCC meeting. A schedule of submission deadlines is available at www.ecu.edu/cs-acad/gcc/index.cfm.

4) The proposers and/or resource person will receive a notification e-mail once their package has been placed on a meeting agenda. This e-mail will contain a link to the meeting agenda on the GCC Web site in which their curriculum proposal package will be reviewed. The agenda will contain the date, time, and location of the GCC meeting and the linked documents for each proposal package. It is recommended that the proposers and/or resource person review these links prior to attending the scheduled GCC meeting.

**Warning:** Occasionally, electronic mail inexplicably disappears. It is the responsibility of the proposing unit to verify that the proposal has been received. Any questions should be directed to gcc@ecu.edu.

**Complete Curriculum Package:**

A complete curriculum package consists of a collection of electronic files. Each file should be in Microsoft Word format (.doc) except for e-mail messages, which should be in Microsoft Outlook format (.msg). The completed signature may be scanned into a (.pdf) file. Any electronic files not in these formats will be returned, delaying their consideration. Moreover, it is important that you turn off the track changes option in Microsoft Word. Any Word file submitted with track changes turned on will be returned. The required files that comprise a complete curriculum package are:

1) **Explanatory Memorandum:** A separate Microsoft Word document containing a cover memorandum outlining the content and requested action regarding the package that is being submitted.

2) **Course Proposal Forms:** Separate Microsoft Word document(s) for each course proposal form. The course description and objectives cannot be changed without approval of the GCC.

3) **Marked Catalog Copy:** A separate Microsoft Word document containing marked catalog copy, clearly illustrating the proposed curricula revisions to the existing catalog. Catalog copy includes both degree requirements and course descriptions. **Catalog revisions must be marked as follows:**
   - Deletions should be marked in red, strikethrough font
   - Additions should be marked in blue, underline font

4) **Completed Signature Form:** A separate (.pdf) document containing all necessary signatures.

5) **Supporting Documentation:** E-mail from the Office of the Registrar, affected departments, etc.

**NOTE:** Any curriculum package not adhering to these requirements will be returned, thus delaying consideration by the GCC. Revisions requested by the GCC must be submitted within two weeks and approved before the proposal will be forwarded to the Graduate School Administrative Board (GSAB).
INSTRUCTIONS FOR COMPLETING THE GRADUATE CURRICULUM COMMITTEE’S COURSE PROPOSAL FORM FOR COURSES NUMBERED 6000 AND ABOVE

Important:

- Use this form only for courses numbered 6000 and above. Courses numbered 1000-4999 should be submitted to the University Curriculum Committee.
- Specific guidelines for submitting curriculum revision packages can be found at: www.ecu.edu/cs-acad/gcc/index.cfm.
- The committee will not review new 5000-level courses or the revision of current 5000-level courses. Units are encouraged to develop 6000-level courses in place of their 5000-level courses.

General Instructions:

- Each box on the form must be completed.
- To type in a box, position your cursor in the box, and click once (if using a Macintosh computer) or left-click once (if using a PC) with the mouse, and type.
- Save the form as a Microsoft Word document, and submit electronically according to the instructions for submitting curriculum packages found at: www.ecu.edu/cs-acad/gcc/index.cfm. Files that cannot be opened due to being saved in an inaccessible format will be returned.

Instructions for Each Item on Course Proposal Form:

The instructions numbered below refer to each numbered box on the GCC Course Proposal Form. Please complete the form in its entirety according to the following directions.

1. List the prefix and course number for the course, (e.g., GEOG 6100 or EXSS 6345).

2. Type in the date the form was completed in the format: mm/dd/20yy

3. Put an “X” in the appropriate box. Remember that if you are requesting approval for a new course, before choosing the course number you must first obtain e-mail verification from the Office of the Registrar giving their approval for the number you desire. If you are renumbering a course, type in the old and new numbers in the appropriate boxes. Otherwise, leave those two boxes blank. Forward the registrar’s e-mail verification to the GCC mailbox with your curriculum package.

4. Current/proposed and future method of delivery (if a course is offered by section in more than one method, check all that apply). Put an “X” in the appropriate box for the category (on-campus, distance, or online course) for both the current and future method of delivery expected within the next three years. If 50% or more of the course content is delivered online, this course should be categorized as online.

5. Justify how the course addresses the assessment of program needs. Identify the committee or group (e.g., Graduate faculty of the Department of English) that conducted the assessment.

6. Type in the course description as it should appear in the catalog. Include the course number, title, s.h. credit, and description in the order traditionally used in the catalog. If you are unsure of the correct order, study courses currently listed in the catalog. When applicable, also include Formerly, Same As, and Credit statements, Lecture/lab/practicum hours, prerequisites/corequisites, etc. Please use correct punctuation to prevent clerical errors from appearing in the graduate catalog. Ensure that your course description is as concise as possible and does not repeat the title of the course. The course description cannot be changed without approval of the GCC.

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Below are examples of a chemistry course and an English course:


**6390. Advanced Studies of Science Fiction and Fantasy (3)** Traditional and contemporary science fiction and fantasy. Emphasis on historical trends, problems, and contemporary movements.

7. If the requested action is the revision of an existing course, briefly explain the change(s).

8. Type in the page number that the course description will appear in the “Courses” section of the current .pdf graduate catalog.

9. Type the appropriate number of semester hours in the appropriate box.

10. Type in the estimated annual enrollment in the proposed course.

11. Type in the appropriate box the degree(s) and or program(s), including yours, that are affected. **It is the responsibility of the unit submitting this proposal to cite the appropriate .pdf pages to ensure an accurate revision.** To obtain a list of references for where a course is listed in a degree or as a prerequisite for another course, access the “Course Search” tool found under Academic Planning on OneStop.

12. If there is any overlap or duplication of the proposed course with existing ECU courses, the proposing unit must contact the affected units/programs and forward their responses electronically to the GCC as part of the curricular package. Type an “X” in the appropriate box. **The GCC does not require that you obtain APPROVAL from other units/programs, only that you NOTIFY them and request a response within five working days.** If your proposal overlaps with an existing course/program that you did not identify, your proposal can be tabled.

13. Does the proposed curriculum revision have any effect on course(s) required for teacher education? If so, approval for the change must be obtained by the Council for Teacher Education (CTE) before submitting the course for approval by the GCC. Type an “X” in the appropriate box. Information regarding CTE can be accessed in Microsoft Outlook, Public Folders, Council for Teacher Education.

14. Does the proposed curriculum revision have any effect on course(s) with a service-learning designation? If so, approval for the change must be obtained by the Service-Learning Advisory Committee (SL) before submitting the course for approval by the GCC. Type an “X” in the appropriate box. Information regarding the service-learning designation can be found on the Volunteer and Service-Learning Center Web site [https://www.ecu.edu/cs-studentlife/volunteer/faculty-service-learning-designation.cfm](https://www.ecu.edu/cs-studentlife/volunteer/faculty-service-learning-designation.cfm).

15. Type an “X” in the appropriate box for each of the segments listed.

16. The information for the course should include:

   A. Text(s) and/or readings

   **Below are examples of bibliographic citations for textbooks:**


For an edited text.


**MLA style:**

Author. *Title of Book*. City of Publication: Publishing House, date.


For an edited text.


B. **Course behavioral objectives** (Course objectives cannot be changed without approval of the GCC.)

Objectives must be stated using outcome-based action verbs (an excellent guide for writing course objectives can be accessed at the following site: [www.odu.edu/educ/roverbau/Bloom/blooms_taxonomy.htm](http://www.odu.edu/educ/roverbau/Bloom/blooms_taxonomy.htm)).

**Below are examples of course behavioral objectives:**

The student will be able to:

a. **Formulate** synthetic reaction schemes to produce complex target molecules.

b. **Critically evaluate** and **analyze** experimental results.

c. **Synthesize** different theoretical constructs as well as empirical design knowledge.

d. **Conceptualize** development proposals at the settlement, neighborhood and block scales.

C. **Course content/topical outline**

Include a topic outline; a detailed semester calendar is not necessary. Be sure the content reflected in the outline also reflects course objectives.

D. **Course assignments, assignment weighting, and grading scale**

D’s are not given in graduate courses. Please do not include instructor names, polices, or other instructor-specific information (e.g., academic dishonesty policies, etc.).

**Below is an example of course assignments, weighting, and grading scale:**

**ASSIGNMENTS/GRADING:**

Participation, including leadership of two seminar discussions: 20 points

Two Case Studies (6-8 pages) and Presentations: 30 points

Final Research Project (20-25 pages) and Presentation: 50 points

**GRADING SCALE:**

90-100 points A

80-89 points B

70-79 points C

below 70 F
Graduate Curriculum Committee Course Proposal Form
for Courses Numbered 6000 and Higher

Note: Before completing this form, please carefully read the accompanying instructions.

1. Course prefix and number:  
2. Date:  
3. Requested action:
   - New Course
   - Revision of Active Course
   - Revision & Unbanking of a Banked Course
   - Renumbering of an Existing Course from
     from # to #

4. Method(s) of delivery (check all boxes that apply for both current/proposed and expected future delivery methods within the next three years):

   Current or Proposed Delivery
   Method(s):  
   - On-campus (face to face)
   - Distance Course (face to face off campus)
   - Online (delivery of 50% or more of the instruction is offered online)

   Expected Future Delivery
   Method(s):  

5. Justification (must cite accreditation and/or assessment by the graduate faculty) for new course or course revision or course renumbering:

6. Course description exactly as it should appear in the next catalog:

7. If this is a course revision, briefly describe the requested change:

8. Graduate catalog page number from current (.pdf) graduate catalog:  

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9. **Course credit:**

<table>
<thead>
<tr>
<th></th>
<th>Weekly</th>
<th>OR</th>
<th>Per Term</th>
<th>Credit Hours</th>
<th>s.h.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture Hours</td>
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<tr>
<td>Lab</td>
<td></td>
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<tr>
<td>Studio</td>
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<tr>
<td>Practicum</td>
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<td></td>
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<tr>
<td>Internship</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (e.g., independent study)</td>
<td></td>
<td></td>
<td></td>
<td>Please explain.</td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours

10. **Anticipated annual student enrollment:**

11. **Affected degrees or academic programs:**

<table>
<thead>
<tr>
<th>Degree(s)/Program(s)</th>
<th>Current Catalog Page</th>
<th>Changes in Degree Hours</th>
</tr>
</thead>
</table>

12. **Overlapping or duplication with affected units or programs:**

- Not applicable
- Notification & response from affected units is attached

13. **Council for Teacher Education (CTE) approval (for courses affecting teacher education):**

- Not applicable
- Applicable and CTE has given their approval

14. **Service-Learning Advisory Committee (SLAC) approval**

- Not applicable
- Applicable and SLAC has given their approval

15. **Statements of support:**

   a. **Staff**
   
   - Current staff is adequate
   - Additional staff is needed (describe needs in the box below):

   b. **Facilities**
   
   - Current facilities are adequate
   - Additional facilities are needed (describe needs in the box below):

   c. **Library**
   
   - Initial library resources are adequate
   - Initial resources are needed (in the box below, give a brief explanation and an estimate for the cost of acquisition of required initial resources):
d. Unit computer resources

<table>
<thead>
<tr>
<th>Unit computer resources are adequate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional unit computer resources are needed (in the box below, give a brief explanation and an estimate for the cost of acquisition):</td>
</tr>
</tbody>
</table>

e. ITCS resources

<table>
<thead>
<tr>
<th>ITCS resources are not needed</th>
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<tbody>
<tr>
<td>The following ITCS resources are needed (put a check beside each need):</td>
</tr>
<tr>
<td>Mainframe computer system</td>
</tr>
<tr>
<td>Statistical services</td>
</tr>
<tr>
<td>Network connections</td>
</tr>
<tr>
<td>Computer lab for students</td>
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<tr>
<td>Software</td>
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</tbody>
</table>

*Approval from the Director of ITCS attached*

16. Course information (see: *Graduate Curriculum and Program Development Manual* for instructions):
   a. Textbook(s) and/or readings: author(s), name, publication date, publisher, and city/state/country

   b. Course objectives for the course (student – centered, behavioral focus)

   c. Course topic outline

   d. List of course assignments, weighting of each assignment, and grading/evaluation system for determining a grade
Signature Form for GCC Curricula Changes

Course Number/Degree under Revision: ____________________________

Originating Unit: ____________________________

Originating College: ____________________________

<table>
<thead>
<tr>
<th></th>
<th>Date</th>
<th>Name (print)</th>
<th>Signature</th>
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<tbody>
<tr>
<td>Unit Chair</td>
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</tr>
<tr>
<td>College Curriculum Committee Chair</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>College Dean</td>
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<td></td>
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<tr>
<td>Chair, CTE (for programs affecting teacher education)</td>
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<tr>
<td>Chair, SLAC (for courses with a service-learning designation)</td>
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<tr>
<td>Chair, GCC</td>
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<tr>
<td>Dean, Graduate School</td>
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</table>
GUIDELINES FOR DEVELOPING AND REVISING COURSES

Establishing a New Prefix Area

The academic unit proposing the prefix should submit such a request to the Office of the Associate Vice Chancellor for Academic Programs via e-mail to coltrainem@ecu.edu. The vice chancellor’s office will advise the unit of the decision regarding the establishment of a new prefix. The unit then submits its requests for new courses using the prefix or for changing the prefix of existing courses to the appropriate curriculum committee(s).

Proposing a New Course

New courses should be submitted on the appropriate Graduate Curriculum Committee’s (GCC) course proposal form. Course proposal forms are located at the GCC Web site. Older forms found on other Web sites should not be used. The form contains instructions for completion and specifies attachments that are to be submitted with the proposal. All applicable sections of the form should be completed. See “Guidelines for Writing Course Descriptions” for explicit information on writing course descriptions. Please note that there are various individuals and Web sites with whom it may be necessary to consult while preparing a course proposal form.

Cross-Listing New or Revised Courses

Cross-listed courses are the same courses offered in more than one unit under different prefixes. The courses may or may not have the same number. These courses appear in the catalog with a “Same as ...” statement. The request should be submitted with a letter of support from each of the units involved in offering the course. When submitting a request for new cross-listed courses, each unit must complete a course proposal form along with the request for cross listing the course. When a proposal includes a revision to a course that is cross-listed with another unit, it is requested that documentation of communication between the units be included as part of the curriculum revision package.

Revising an Existing Course

The methods for revising an existing course vary, and are listed below:

Course Description Change: Submit a course proposal form with any required attachments.

Course Number Change at Same Level: Submit by memorandum if there is no course content or course-level change. Attach a course syllabus. Course numbers must be cleared with the Office of the Registrar. Submit a copy of the registrar’s e-mail along with your memorandum and syllabus. If the renumbering is not to occur until a later semester, please indicate the semester in which the new number is applicable.

Course Number Change to Different Level: Submit a course proposal form if the course number is changing levels (e.g., 6000 to 7000 level). If the course impacts another course
or degree program outside the unit, that unit head should be advised and a memorandum of support should be attached to the request submitted to the GCC. If the renumbering is not to occur until a later semester, please indicate the semester in which the new number is applicable.

Credit Hour Change: Submit a course proposal form with any required attachments.

Objectives Change: Submit a course proposal form with any required attachments.

Prefix Change: Submit by memorandum. Provide old and new prefix, number, title, and s.h. credit. Include documentation that the Office of Academic Programs approved the prefix.

Prerequisite Change: Submit by memorandum if there is no other course content change (content change requires course proposal form).

Title Change: Submit by memorandum if there is no course content change. Attach course syllabus.

Deleting a Course

Submit a signature form and memorandum that includes the course prefix, number, full title, and page number on which the course is listed in the current (.pdf) catalog. If the course being deleted is included in a degree or as a prerequisite in another discipline, please notify the respective unit of your action and submit a copy of that notification to the committee along with any response received from that unit. An appearance before the committee is not required for this request.

Banking or Unbanking a Course

Banking: Submit a signature form and memorandum, explaining why your unit is banking the course. If the course being deleted is included in a degree or as a prerequisite in another discipline, please notify the respective unit of your action and submit a copy of that notification to the committee along with any response received from that unit. An appearance before the committee is not required for this request.

Unbanking: Submit a completed course proposal form. There is a place on the course proposal form to indicate unbanking.
GUIDELINES FOR WRITING COURSE DESCRIPTIONS

Course descriptions should be developed in the following order and inserted in the appropriate area of the course proposal form, based on this guide. Course descriptions cannot be changed without approval of the GCC.

Items 1-4 are required for all courses.

1. **Prefix:** Always include the prefix of the course. (Concentration areas in the Schools of Art and Music courses carry the ART or MUSC prefix, respectively. Indicate concentration area under which the course is to be listed in parentheses between prefix and number. If course is cross-listed under more than one area, indicate both areas.)

2. **Number:** Include course number as approved by the Office of the Registrar. If the course and lab will typically be taken together, combine into one course listing and submit on the same form. If the lab may be taken with another course, include a separate listing/form for lab.

3. **Title:** The course title should reflect the overall intent of the course, and will be listed in the Office of the Registrar as approved.

4. **Semester Hour Credit:** Indicate the number of s.h. credit for the course by placing the Arabic numeral in parentheses. If the course listing consists of more than one course number, enter the s.h. credit for both, separated by a comma.

   Example: BIOL 7880, 7881. Bioinformatics (4,0)

Items 5 and 6, if applicable.

5. **Formerly:** If a course is being renumbered, include the previous course prefix and number.

   Example: PHLY 7715. Seminar in Physiology (1) Formerly PHLY 6715

6. **Same As:** If a course is cross-listed in the catalog under another prefix include the other listings of the course.

   Example: HIST 6440. Maritime Cultural Resources (3) Same as MAST 6640

Items 7 and 8, if applicable.

7. **Other Info:** There is a vast amount of information that might be included at this point in the course. In the example that follows at the end of this subsection, not all of the
following items will appear; however, if more than one of the areas below is to be
included in the course description, they should appear in the following order:

- May be taken concurrently. (If more than one course is listed.)
- 3 lecture and 2 lab hours per week. (This wording may be used for lecture, lab, field
placement and internship hours.)
- Conferences with program director may be required.
- May be repeated for maximum of 6 s.h. (This means that a 3 s.h. course may be
taken twice for credit; if the course is repeated beyond this, then no credit will be
given.)
- Students normally expected to provide personal transportation to field site.
- No previous knowledge of French required.
- Taught in German.

If there is information to be entered in this field that is not covered above, please submit
concise wording at this point.

8. **Prerequisites**: List prerequisites in alpha numeric order. Major/minor, class-level, or
GPA stipulations precede course prerequisites. Abbreviations to indicate course
prerequisites, corequisites, etc., should be indicated in the following order:

- P: = Prerequisites
- RP: = Recommended Prerequisites
- P/C: = Prerequisites or Corequisites
- RP/C: = Recommended Prerequisites or Corequisites
- C: = Corequisites
- RC: = Recommended Corequisites

Pre/corequisites should be listed, as applicable, in the alphabetical and numerical order by
prefix and number as follows. The semicolon between prerequisites indicates “and,”
unless followed by the word “or.” When granting consent by the departmental
chairperson, use the abbreviation chair.

**Item 9 is required for most courses.**

9. **Content Description**: A standard pattern of writing that reduces the number of articles
(the, these, this, etc.) is always used when writing the content description. The *Chicago
Manual of Style*, the university standard, is used for capitalization. The course title should
not be repeated as opening words of description. Use only one space between punctuation
and the next word. Please do not begin the description with “This course….”

If a course contains material that is not discipline-specific, the description should indicate
how the course differs from other offerings. Course descriptions should be succinct, yet
descriptive, and not merely consist of lists of topics.
GUIDELINES FOR DEVELOPING/REVISING DEGREE REQUIREMENTS AND PREPARING CATALOG COPY

All proposed revisions to degree requirements, including concentration areas and options, minors, and degree program admission requirements, originate in the academic unit by the faculty and are processed through the academic unit curriculum committee, the appropriate college or school curriculum committee and the Council for Teacher Education, when appropriate.

Revisions to graduate programs are submitted via e-mail to the Graduate Curriculum Committee (GCC) for approval, and are subject to the approval of the Graduate School Administrative Board. Proposals regarding teaching programs should be approved by the Council on Teacher Education before they are submitted to the GCC.

The electronic submission should include the following:
- Explanatory memorandum
- Course Proposal Forms
- Marked catalog copy
- E-mail messages from the Office of the Registrar, affected departments, etc.
- Signature Form

To create marked catalog copy:
- The university’s online catalogs are located at www.ecu.edu/cs-acad/aa/SrchCatalog.cfm. Select either the PDF or HTML current graduate catalog. The HTML catalog has a printer friendly icon that enables the user to create catalog copy that does not need to be reformatted. If you have questions about either of these catalogs, please contact Diane Coltraine in the Office of Academic Programs (coltrainem@ecu.edu or 328-1425).
- Locate the text that needs revising within the selected online catalog. With your cursor (left click on mouse), highlight the HTML catalog text that needs to be revised. With a right click, “copy” the text. Open a Microsoft Word file and then paste (right click on mouse) the selected text. Please include enough text to enable GCC members to clearly identify the selected catalog text that you are revising.
- If you wish to delete text, use a red strike-through font (toolbar, format, font, click on “strike-through” and use the drop menu to change the font color to red).
- If you wish to add text, use blue underlined text (toolbar, format, font, use drop menus for “indicate underline style” and then “indicate underlined color”).
- The GCC will not consider marked catalog copy that has been revised using “track changes”.
- Copy the URL found at the top of the Web page and then paste it onto the file that contains your catalog revisions. If you are revising multiple Web pages, clearly identify each page with a separate URL.
- If you revise multiple paragraphs on a single Web page, please copy and paste the entire page.
- If you have questions about creating marked catalog copy, please contact Kimberly Nicholson in the Office of Academic Programs (nicholsonk@ecu.edu or 328-2623).
The catalog copy submitted to the GCC should indicate all proposed changes by striking through deletions and underlining new text, as follows:

- Changes to the hours specified for the total degree or in any area of the degree should be indicated by striking through the existing hours, inserting new hours using a blue font and underlining the proposed hours.
- Degree requirements being deleted or replaced should be struck-through in red.
- Requirements that are added should be typed and underlined using a blue font and underlining new text.

Also, note the following:

- Course additions should be complete with semester(s) offered, prerequisites, etc.
- Any revisions to degree admission requirements should be justified by memorandum.
- Any request to delete a degree or minor should include verification of unit faculty support.
Sample: Typical Course Proposal Form

Graduate Curriculum Committee Course Proposal Form for Courses Numbered 6000 and Higher

Note: Before completing this form, please carefully read the accompanying instructions.

1. Course prefix and number: PTHE 8302
2. Date: 11/25/2008

3. Requested action:
   - New Course
   - Revision of Active Course
   - Revision & Unbanking of a Banked Course
   - Renumbering of an Existing Course from 
     from # to #

4. Method(s) of delivery (check all boxes that apply for both current/proposed and expected future delivery methods within the next three years):
   - On-campus (face to face)
   - Distance Course (face to face off campus)
   - Online (delivery of 50% or more of the instruction is offered online)

5. Justification (must cite accreditation and/or assessment by the graduate faculty) for new course or course revision or course renumbering:
   An ongoing assessment by the Graduate Faculty in the Department of Physical Therapy determined the need to include additional material related to neurologic rehabilitation of the patients with spinal cord injury in this course.

6. Course description exactly as it should appear in the next catalog:

7. If this is a course revision, briefly describe the requested change:
   Increase credit hours from 3 to 4 based on inclusion of content related to spinal cord injury and neuromuscular integration. The course description has also been augmented.

8. Graduate catalog page number from current (.pdf) graduate catalog: 154
9. Course credit:

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Weekly OR Per Term</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>30</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>Lab</td>
<td>60</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>Studio</td>
<td></td>
<td>s.h.</td>
</tr>
<tr>
<td>Practicum</td>
<td></td>
<td>s.h.</td>
</tr>
<tr>
<td>Internship</td>
<td></td>
<td>s.h.</td>
</tr>
</tbody>
</table>

Other (e.g., independent study) Please explain.

Total Credit Hours 4 s.h.

10. Anticipated annual student enrollment: 30

11. Affected degrees or academic programs:

<table>
<thead>
<tr>
<th>Degree(s)/Program(s)</th>
<th>Current Catalog Page</th>
<th>Changes in Degree Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctor of Physical Therapy</td>
<td>153</td>
<td>none</td>
</tr>
</tbody>
</table>

12. Overlapping or duplication with affected units or programs:

X Not applicable

Notification & response from affected units is attached

13. Council for Teacher Education (CTE) approval (for courses affecting teacher education):

X Not applicable

Applicable and CTE has given their approval.

14. Service-Learning Advisory Committee (SLAC) approval

X Not applicable

Applicable and SLAC has given their approval.

15. Statements of support:

a. Staff

X Current staff is adequate

Additional staff is needed (describe needs in the box below):

b. Facilities

X Current facilities are adequate

Additional facilities are needed (describe needs in the box below):

c. Library

X Initial library resources are adequate

Initial resources are needed (in the box below, give a brief explanation and an estimate for the cost of acquisition of required initial resources):
d. Unit computer resources

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Unit computer resources are adequate</td>
</tr>
<tr>
<td></td>
<td>Additional unit computer resources are needed (in the box below, give a brief explanation and an estimate for the cost of acquisition):</td>
</tr>
</tbody>
</table>

e. ITCS resources

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>ITCS resources are not needed</td>
</tr>
<tr>
<td></td>
<td>The following ITCS resources are needed (put a check beside each need):</td>
</tr>
<tr>
<td></td>
<td>Mainframe computer system</td>
</tr>
<tr>
<td></td>
<td>Statistical services</td>
</tr>
<tr>
<td></td>
<td>Network connections</td>
</tr>
<tr>
<td></td>
<td>Computer lab for students</td>
</tr>
<tr>
<td></td>
<td>Software</td>
</tr>
<tr>
<td></td>
<td>Approval from the Director of ITCS attached</td>
</tr>
</tbody>
</table>

16. Course information (see: Graduate Curriculum and Program Development Manual for instructions):

a. Textbook(s) and/or readings: author(s), name, publication date, publisher, and city/state/country


b. Course objectives for the course (student – centered, behavioral focus)

The student will be able to:

1. Interpret the history of neurotherapeutic techniques including its founders, development, past and current approaches.

2. Evaluate a peer using a neurological examination; selecting tests and assessments appropriate for the given diagnoses of: CVA, TBI and SCI.

3. Distinguish impairments and functional limitations in relation to specific testing and clinical diagnosis.

4. Evaluate and determine specific treatment techniques of Brunnstrom, PNF, NDT and MRP understanding appropriate application to specific impairments and disorders.

5. Examine a neurological client under the supervision of a licensed PT; completing an examination, assessment, goals and treatment plan.

6. Compare a variety of wheelchair designs and discuss evaluation and measurements necessary in determining an appropriate wheelchair to meet a patient’s needs.

7. Analyze problems adult neurological patients are confronted with in addition to neuromuscular dysfunction and recommend appropriate referral sources.
### c. Course topic outline

<table>
<thead>
<tr>
<th>Historical Perspectives of Neurological Rehabilitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neurological Examination</td>
</tr>
<tr>
<td>Cerebral Vascular Accident (CVA)</td>
</tr>
<tr>
<td>Traumatic Brain Injury (TBI)</td>
</tr>
<tr>
<td>Examination of Balance</td>
</tr>
<tr>
<td>Brunstrom Techniques</td>
</tr>
<tr>
<td>Proprioceptive Neuromuscular Facilitation (PNF)</td>
</tr>
<tr>
<td>Neurodevelopmental Treatment Techniques (NDT)</td>
</tr>
<tr>
<td>Motor Relearning Programme (MRP)</td>
</tr>
<tr>
<td>Spinal Cord Anatomy/Mechanism of Injury (SCI)</td>
</tr>
<tr>
<td>Spinal Cord Examination</td>
</tr>
<tr>
<td>Acute Management of SCI Patient</td>
</tr>
<tr>
<td>Wheelchair Prescription</td>
</tr>
<tr>
<td>Structured Clinical Experience with Neurological Patient</td>
</tr>
</tbody>
</table>

### d. List of course assignments, weighting of each assignment, and grading/evaluation system for determining a grade

<table>
<thead>
<tr>
<th>Written Examinations:</th>
<th>There will be three written examinations over the materials presented in this course. Each exam will be worth 20% for a total of 60%.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case Studies:</td>
<td>There will be three case studies based on neurological patients worth a total of 10%.</td>
</tr>
<tr>
<td>Laboratory Examination:</td>
<td>There will be one laboratory examination worth 30%.</td>
</tr>
</tbody>
</table>

#### Grading Scale
- **A** 90-100%
- **B** 80-89%
- **C** 70-79%
- **F** <70%
Memo to: ECU Graduate Curriculum Committee
From: Dr. D. S. Blaise Williams, Director of Graduate Studies, Department of Physical Therapy
Cc: Dr. Denis Brunt, SAHS GCC
Re: Doctorate of Physical Therapy Program Curriculum Changes
Date: Tuesday, November 25, 2008

The Department of Physical Therapy would like to make the following change to the Graduate Catalog beginning in the academic semester Spring 2009.

1. Adult Therapeutic Intervention I (PTHE 8302) will have a change from 3 credit hours to 4 credit hours. The course description will be changed to reflect the inclusion of material related to spinal cord injury and neuromuscular integration.

This change will not change the overall number of credit hours in the degree as a number of changes have occurred in courses over the past 3 years and this is the final change for the final class. Included you will find the revised course description for the above referenced course, the new catalog description and the signature page. If you have any further questions, please call me at 744-6248.

Respectfully submitted,

D. S. Blaise Williams III, Ph.D., MPT
Director of Graduate Studies
Department of Physical Therapy
College of Allied Health Sciences
williamsdor@mail.ecu.edu
PTHE: Physical Therapy

8301. Motor Control and Movement Disorders (3) P: PTHE 8101 or consent of instructor. Neuroscience principles and mechanisms of normal and impaired movement, learning, emphasizing research and practice.

8302. Adult Therapeutic Intervention I (4) (3) P: PTHE 8101. Applies examination, and therapeutic intervention and neuromuscular integration methods effective in identifying and treating motor control dysfunctions in adults with neurological and spinal cord injuries.

Sample: Complex Course Proposal Form

Graduate Curriculum Committee Course Proposal Form
for Courses Numbered 6000 and Higher

Note: Before completing this form, please carefully read the accompanying instructions.

1. Course prefix and number: PHYS 8526, 8527, 8528  2. Date: 03/05/2009

3. Requested action:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>New Course</td>
</tr>
<tr>
<td></td>
<td>Revision of Active Course</td>
</tr>
<tr>
<td></td>
<td>Revision &amp; Unbanking of a Banked Course</td>
</tr>
<tr>
<td></td>
<td>Renumbering of an Existing Course from</td>
</tr>
<tr>
<td></td>
<td>from # to #</td>
</tr>
</tbody>
</table>

4. Method(s) of delivery (check all boxes that apply for both current/proposed and expected future delivery methods within the next three years):

<table>
<thead>
<tr>
<th>Current or Expected</th>
<th>Proposed Delivery</th>
<th>Future Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method(s):</td>
<td>Method(s):</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>On-campus (face to face)</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Distance Course (face to face off campus)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Online (delivery of 50% or more of the instruction is offered online)</td>
<td>X</td>
</tr>
</tbody>
</table>

5. Justification (must cite accreditation and/or assessment by the graduate faculty) for new course or course revision or course renumbering:

The graduate faculty of the ECU Department of Physics assessed that the growth in enrollment in the biomedical physics PhD program has led to an increasing demand for flexible instruction instruments that can accommodate a growing number of PhD students with individualized research driven interests and needs.

6. Course description exactly as it should appear in the next catalog:

8526, 8527, 8528. Advanced Readings in Physics I, II, III (1,2,3) May be repeated. May count maximum of 12 s.h. Equivalent of 1 classroom hour per week, per credit hour. P: Consent of assistant chair for graduate studies. Intensive readings at the advanced PhD level in a physics field under supervision of faculty.

7. If this is a course revision, briefly describe the requested change: N/A

8. Graduate catalog page number from current (.pdf) graduate catalog: 120
9. **Course credit:**

<table>
<thead>
<tr>
<th></th>
<th>Lecture Hours</th>
<th>Weekly OR</th>
<th>Per Term</th>
<th>Credit Hours</th>
<th>s.h.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab</td>
<td>0</td>
<td></td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Studio</td>
<td>0</td>
<td></td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Practicum</td>
<td>0</td>
<td></td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Internship</td>
<td>0</td>
<td></td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Other (e.g., independent study) Please explain. **Independent study usually involving special interest topics in contemporary physics research under the supervision of a faculty member**

<table>
<thead>
<tr>
<th></th>
<th>s.h.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Credit Hours</td>
<td>1-3</td>
</tr>
</tbody>
</table>

10. **Anticipated annual student enrollment:**

<table>
<thead>
<tr>
<th></th>
<th>5</th>
</tr>
</thead>
</table>

11. **Affected degrees or academic programs:**

<table>
<thead>
<tr>
<th>Degree(s)/Program(s)</th>
<th>Current Catalog Page</th>
<th>Changes in Degree Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS Physics</td>
<td>117</td>
<td>none</td>
</tr>
<tr>
<td>PhD Biomedical Physics</td>
<td>117</td>
<td>none</td>
</tr>
</tbody>
</table>

12. **Overlapping or duplication with affected units or programs:**

<table>
<thead>
<tr>
<th></th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notification &amp; response from affected units is attached</td>
<td></td>
</tr>
</tbody>
</table>

13. **Council for Teacher Education (CTE) approval (for courses affecting teacher education):**

<table>
<thead>
<tr>
<th></th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable and CTE has given their approval</td>
<td></td>
</tr>
</tbody>
</table>

14. **Service-Learning Advisory Committee (SLAC) approval**

<table>
<thead>
<tr>
<th></th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable and SLAC has given their approval</td>
<td></td>
</tr>
</tbody>
</table>

15. **Statements of support:**

a. **Staff**

<table>
<thead>
<tr>
<th></th>
<th>Current staff is adequate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional staff is needed (describe needs in the box below):</td>
<td></td>
</tr>
</tbody>
</table>

b. **Facilities**

<table>
<thead>
<tr>
<th></th>
<th>Current facilities are adequate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional facilities are needed (describe needs in the box below):</td>
<td></td>
</tr>
</tbody>
</table>

c. **Library**

<table>
<thead>
<tr>
<th></th>
<th>Initial library resources are adequate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial resources are needed (in the box below, give a brief explanation and an estimate for the cost of acquisition of required initial resources):</td>
<td></td>
</tr>
</tbody>
</table>
d. Unit computer resources

<table>
<thead>
<tr>
<th>X</th>
<th>Unit computer resources are adequate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Additional unit computer resources are needed (in the box below, give a brief explanation and an estimate for the cost of acquisition):</td>
</tr>
</tbody>
</table>

---

e. ITCS resources

<table>
<thead>
<tr>
<th>X</th>
<th>ITCS resources are not needed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The following ITCS resources are needed (put a check beside each need):</td>
</tr>
<tr>
<td></td>
<td>Mainframe computer system</td>
</tr>
<tr>
<td></td>
<td>Statistical services</td>
</tr>
<tr>
<td></td>
<td>Network connections</td>
</tr>
<tr>
<td></td>
<td>Computer lab for students</td>
</tr>
<tr>
<td></td>
<td>Software</td>
</tr>
<tr>
<td></td>
<td>Approval from the Director of ITCS attached</td>
</tr>
</tbody>
</table>

---

16. Course information (see: Graduate Curriculum and Program Development Manual for instructions):

a. Textbook(s) and/or readings: author(s), name, publication date, publisher, and city/state/country

| Selected reading materials to support the student’s specialized research topic of interest. |

b. Course objectives for the course (student – centered, behavioral focus)

<table>
<thead>
<tr>
<th>Student will be able to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Recognize topics of research relevance in an emerging area of physics.</td>
</tr>
<tr>
<td>• Assemble the acquired skills towards the goal of developing an original research project.</td>
</tr>
</tbody>
</table>

c. Course topic outline

<table>
<thead>
<tr>
<th>Topics will vary depending on the specific student educational needs and interests. Illustrative hypothetical:</th>
</tr>
</thead>
<tbody>
<tr>
<td>A student would like to take a readings course on a topic of current interest and chooses the area of Proton Radiotherapy. For the three scenarios below, student and professor agree that the base text for the course would be Proton Radiotherapy Accelerators by Wioletta Wieszczyscka and Waldemar H. Scharf, World Scientific, Singapore:2001.</td>
</tr>
<tr>
<td><strong>Scenario 1: 1 s.h.</strong></td>
</tr>
<tr>
<td>Student would read chapters 1-4 and a selected number (typically 3 per chapter) of additional references from the current literature. Student would meet with professor weekly for a minimum of 20 minutes to assess progress and understanding of the subject matter. Student would write a 1500-2000-word report summarizing the physical and radiobiological properties of protons and hadrons as well as the current state of the art of clinical research in hadrontherapy. Report should identify possible areas for research.</td>
</tr>
<tr>
<td><strong>Scenario 2: 2 s.h</strong></td>
</tr>
</tbody>
</table>
Student would read chapters 1-9 and a selected number (typically 5 per chapter) of additional references from the current literature. Student would meet with professor weekly for a minimum of 40 minutes to assess progress and understanding of the subject matter. Student would write two 1500-2000-word reports. The first report would summarize the physical and radiobiological properties of protons and hadrons as well as the current state of the art of clinical research in hadrontherapy. The second report would identify the technical requirements for hadrontherapy facilities, and offer a detailed overview of the accelerators, beam transport, delivery systems and gantries. Both reports should identify possible areas for research that provide some level of detail as to how such research could be carried out.

Scenario 3: 3 s.h

Student would read chapters 1-14 and a selected number (typically 5 per chapter) of additional references from the current literature. Student would meet with professor weekly for a minimum of 60 minutes to assess progress and understanding of the subject matter. Student would write two 1500-2000-word reports. The first report would summarize the physical and radiobiological properties of protons and hadrons as well as the current state of the art of clinical research in hadrontherapy. The second report would identify the technical requirements for hadrontherapy facilities, and offer a detailed overview of the accelerators, beam transport, delivery systems and gantries. The third report would be longer (2000 word minimum), providing a detailed description of the steps that go in designing and operating a hadrontherapy facility. All three reports should identify possible areas for research that provide some level of detail as to how such research could be carried out. The third report should, in addition, identify one specific topic studied during the semester and make a detailed discussion of the relevance of the selected topic and provide an in-depth description of how such research could be carried out.

d. List of course assignments, weighting of each assignment, and grading/evaluation system for determining a grade

<table>
<thead>
<tr>
<th>Course assignments and grading will be mutually agreed upon by faculty supervisor and student and must be approved by the Assistant Chair for Graduate Studies prior to enrollment. The assignments (reading and written) must be chosen so as to reflect the number of credit hours of the course and provide study loads as follows:</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 8526 – equivalent to 1 classroom hour per week;</td>
</tr>
<tr>
<td>PHYS 8527 – equivalent to 2 classroom hours per week;</td>
</tr>
<tr>
<td>PHYS 8528 – equivalent to 3 classroom hours per week.</td>
</tr>
</tbody>
</table>

Students will be graded on a 100 point scale.

\[ F < 71, 71 \leq C < 81, 81 \leq B < 91, A \geq 91. \]
MEMORANDUM

To: Scott Dellana, Chair
   Graduate Curriculum Committee

From: Edson Justiniano, Assistant Chair for
   Graduate Studies in Physics

Date: March 11, 2009

Subject: Explanation of curriculum changes

It is a pleasure to submit to your committee the enclosed proposal for establishing a new concentration under the MS in Physics degree program as well as course additions affecting the MS and PhD programs offered by the Department of Physics.

The Department of Physics, Thomas Harriot College of Arts and Sciences, in collaboration with the Department of Health Education and Promotion, College of Health and Human Performance, proposes to establish a Health Physics concentration within the current Physics Master’s Degree Program of the Department of Physics. This concentration is planned to fill an urgent need for trained Health Physics professionals brought about by resurgence in the development of nuclear power, an expansion of programs in national security, and an ageing cadre of current Health Physics professionals. This, coupled with the fact that there is no longer a state supported program in Health Physics in the University of North Carolina system encourages the initiation of a program at East Carolina University. Because the new Health Physics concentration will be developed and housed as a component of the current MS degree in Physics, it will take advantage of courses that are common to the Medical Physics and traditional Applied Physics concentrations and thus necessitate a reduced number of new courses specific to this new degree concentration.

The collaboration between the Departments of Physics and Health Education and Promotion (HE&P) profits from experience gained by HE&P in their BS degree focusing on Health Physics, and their MS in Environmental Health with concentration on Industrial Hygiene. New courses in nuclear instrumentation and field studies in health physics will be available to students in HE&P, thereby strengthening their current degree programs in Environmental Health. Reciprocally, existing courses in Environmental Health will be integrated into the Physics Department’s Health Physics concentration to produce graduates with unique skills to enter the workplace. Many employment opportunities in the modern workplace build upon skills in both radiation and environmental sciences, and graduates of this new degree option will be uniquely qualified for those opportunities.
Students in the MS-Health Physics concentration will be required to complete a minimum of 39 semester hours of didactic and laboratory courses from a prescribed set of core, concentration, and elective courses while maintaining a minimum cumulative GPA of 3.0. In lieu of Master’s research and thesis, students in the Health Physics option will spend from 10 to 16 weeks fulfilling an approved rigorous practicum in applied health physics in an industrial, university, or National Laboratory setting. The specific student practicum can be arranged by the Chair of the Department of Physics, Assistant Chair for Graduate Studies in Physics, a faculty member, or the student; final approval of the practicum will be the responsibility of the Graduate Committee of the Department of Physics.

In addition the following courses are being proposed:

1. **PHYS 6750** – New course – Justification: This course is being introduced to serve as one of the base courses for the new Health Physics concentration being proposed. It will introduce an important component addressing how to convey risk, either through written or oral communication, to a lay population.

2. **PHYS 7730, 7740** – New courses – Justification: These courses are being introduced to serve as base courses for the new Health Physics concentration being proposed. In addition to the important role these courses will play in the Health Physics concentration, they will also provide students in the other Physics degree program with valuable intellectual enrichment opportunities.

3. **PHYS 7992** – New course – Justification: One of the cornerstones of the Medical Physics concentration is offering students with hands-on experience in a clinical setting. Up to now, this has been done within a special section of our PHYS 6900 – Introduction to Research course that Medical Physics students take in their second year in the program. This practice, however, has serious drawbacks by not accurately reflecting the nature of the course in the student’s transcript. This shortcoming is compounded by the fact that PHYS 6900 only provides 3 s.h. of academic credit. The latter deficiency causes the student’s transcript to not truthfully indicate how intensive the course is and also shortchanges both the instructor and the department on their efforts.

4. **PHYS 8526, 8527, and 8528** – New courses – Justification: This sequence of courses is being introduced to address needs, in the PhD in Biomedical Physics program, so as to provide individualized instruction to our students. Departmental experience has shown that, given the broad scope of our research programs, it is necessary to have flexible didactic instruments to acquaint advancing PhD students with the literature pertinent to their specific research interests while, at the same time, providing accurate accounting of the amount and level of instruction being delivered.
MS in Physics

The Department of Physics offers the master of science in physics with concentrations in applied physics and medical physics, applied physics, health physics, and medical physics. Students seeking a MS degree must apply and be admitted into one of these three concentrations. A satisfactory knowledge of an acceptable computer language or of an acceptable foreign language is required. Attendance at a minimum of one-half of the regular Department of Physics seminars given during the student's residence in the graduate program is required.

The applied physics concentration requires a minimum of 34 s.h. of courses and the completion of a thesis whereas the medical physics concentration requires 6 s.h. of clinical study in lieu of thesis. The health physics concentration requires a minimum of 39 s.h. of courses, and, in addition, students must complete a 10-16 week rigorous practicum in applied health physics in an industrial, university or national laboratory setting in lieu of a thesis. The medical physics concentration requires a minimum of 38 s.h. of courses that include a minimum of 6 s.h. of clinical study in lieu of a thesis.

1. Core - 16-22 s.h.
   - PHYS 5410*, 5600, 5601, 5900, 5901, 6816
   - Applied physics concentration: Thesis PHYS 7000 (repeated once); minimum of 6 s.h. electives from: PHYS 6250, 6700, 6715, 6900
   - Health physics concentration: EHST 5164, 5800; PHYS 6900; minimum of 3 s.h. electives from: EHST 6700, PHYS 6200, 7450
   - Medical physics concentration: PHYS or RONC 6992, 6993; PHYS 5410* minimum of or 3 s.h. electives from: PHYS 6300, 6900 7992

2. Concentration (Choose one area.) - 12-19 s.h.
   - Applied physics (12 s.h.): PHYS 5311, 6200, 6300, 7450
   - Health physics (19 s.h.): RONC 7370; HLTH 6011; PHYS 6700, 6750, 7730, 7740
   - Medical physics (18-19 s.h.): BIOL or RONC 7370; PHYS 6700, 6710, 6715, 6720; PHYS or RONC 6718
*Students in the medical physics concentration who have had an undergraduate course in quantum mechanics may substitute the 3 s.h. elective, listed above, for PHYS 5410.

In addition, a student in the medical physics concentration must demonstrate a satisfactory knowledge of medical terminology through taking BIOL 2130 (preferred) or HIMA 3000.

Termination rules:

1. A student must receive a minimum final grade of B in each of the required courses in the medical physics option.
2. A student, because of inappropriate behavior in a clinical setting, will be immediately suspended by the instructor. A review by the Graduate Committee will determine if the student is eligible to continue in the medical physics option.

PhD in Biomedical Physics

The primary objective of the PhD program in biomedical physics is to graduate scientists who can apply the tools and concepts of physics to solve significant biological and medical problems and advance our understanding of fundamental biomedical processes. Core curricula in both applied physics and biomedical areas are designed to provide training for students with diverse backgrounds in physics, applied physics, biochemistry, and engineering. All students are required to complete a dissertation project under supervision of a faculty advisor.

Admission

The applicant must have a master’s degree in physics, applied physics, medical physics, or related fields or must have shown a significant progress towards obtaining a master’s degree in the above fields. Acceptable performance on the GRE and a minimum cumulative GPA of 3.0 on a 4.0 scale in graduate work are required.

The following documents are required before final admission is approved: completed application form for admission to Graduate School, official transcripts from colleges and universities attended, official or certified copy of score reports of the GRE and TOEFL (if applicable), letters of reference from three persons who can attest to the applicant’s academic competence, and an essay describing the applicant’s career goals and research interests which are consistent with the educational opportunities offered in the PhD program.

Course and Residence Requirements

The PhD program requires a minimum of 30 s.h. of courses beyond the master’s degree. The student will take a minimum of 6 s.h. of courses from a physics core, a minimum of 6 s.h. of courses from a biomedical core, and a minimum of 18 s.h. of dissertation research courses. Additional courses may be required by the executive committee, depending on the individual student’s preparation. Students must demonstrate a working knowledge of at least one high-level computer language, such as FORTRAN or C. Students must pass doctoral candidacy exam and write and successfully defend a doctoral dissertation.

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Students must complete at least five consecutive semesters in residence (excluding summers).

Transfer Credits

Because of the broad interest and collaborative nature of the PhD program, the executive committee will evaluate transfer credits on a case-by-case basis. A maximum of 6 s.h. of transfer credit may be accepted.

If a student enrolls in this program and already has the equivalent of the 12 s.h. beyond the master's degree, he or she may petition the executive committee for a waiver of or substitution for these courses. After a majority of the core courses have been completed, students in this program must pass the doctoral candidacy examination before being admitted to candidacy for the PhD in biomedical physics.

Other Requirements

The PhD program should be completed by the end of three years following the student's initial enrollment. With the endorsement of the advisory committee, a student having deficiencies in preparation may request

**PHYS: Physics**

5311. Mathematical Physics I (3) Same as MATH 5311 P: MATH 4331; PHYS 2360; or consent of instructor. Mathematical methods important in physics. Emphasis on application. Functions of complex variables, ordinary and partial differential equations, integrals and integral transforms, and special functions.

5410. Introduction to Quantum Mechanics (3) P: PHYS 4416, 4560; or consent of instructor. Survey of the fundamental principles of quantum mechanics and their application to the solution of selected problems in atomic, molecular, condensed matter, and biological physics.

5600, 5601. Modern Electronics (3,0) 2 lecture and 2 lab hours per week. P: PHYS 4610. Theory and application of modern electronic devices. Circuit design using linear, nonlinear, and hybrid integrated circuits and their application in a graphical (GUI), computer-based environment for scientific instrument and process control.

5900, 5901. Computational Physics (3,0) 1 lecture and 4 lab hours per week. P: MATH 4331; PHYS 2360 or 5311. Applies modern computer program with symbolic, numerical, and graphical capabilities to problems in physics.


6300. Electrodynamics I (3) P: Intermediate electromagnetic theory. Boundary value

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problems in electrostatics. Emphasis on use of Green’s functions and special functions, multipoles and dielectrics, magnetostatics Maxwell’s equations, and plane EM waves, wave guides and resonant cavities.

6410. Quantum Mechanics I (3) Formerly PHYS 5400 P: PHYS 5410; or consent of instructor. Intermediate study of the principles of quantum mechanics and their application to selected subfields of physics.

6526, 6527, 6528. Readings in Physics I, II, III (1,2,3) Equivalent of 1 classroom hour per week, per credit hour. P: Consent of chair. Intensive readings or problem research in some physics-related field under supervision of faculty.

6620, 6621. Advanced Techniques in Experimental Physics (2,1) 2 classroom and 3 lab hours per week. P: Graduate standing in PHYS or CHEM. Experimental techniques in radio frequency spectroscopy (NMR, ESR, and NEQR), microwave applications, and accelerator-based atomic physics (trace element analysis using x-rays), which includes theory of phenomena and operation of lab instruments.

6700. Health Physics (3) Formerly PHYS 5700 P: Consent of instructor. Broad spectrum of topics in radiation protection. Emphasis on interactions of radiation with matter, methods of radiation detection, dosimetry, principles of shielding, and regulations pertaining to work with radiation.

6710. Nuclear Medicine Physics (3) P: PHYS 4417 or consent of director of medical physics. Comprehensive overview of physical aspects of diagnostic and therapeutic applications of radionuclides, radiation beams and measurements, imaging systems, and related equipment with lab activities in facility design, instrumentation essentials, quality assurance, and survey techniques.

6715. Biomedical Physics (3) Formerly PHYS 5715 P: Consent of instructor. Applies physics principles in biology and medicine.

6718. Therapeutic Radiological Physics (3) Same as RONC 6718 P: Consent of director of medical physics. Production, application, and measurement of electromagnetic radiation and high energy particle beams in therapeutic practice. Emphasis on conceptual, instrumental, and methodological aspects of therapeutic radiology.

6720. Physics of Medical Imaging (3) P: PHYS 6710 or consent of director of medical physics program. Physical principles of diagnostic radiology. Analog and digital x-ray radiography (including mammography), fluoroscopy, and computed tomography. Principles and applications of ultrasound and magnetic resonance imaging, diagnostic calibration, radionuclide sources, counters, scanners, cameras, dosimetry, recording media, film densitometry, non-film media, and image evaluation.

6750. Risk Assessment, Risk Communication and Regulations (3) P: Consent of instructor. Risk assessment and communication including relative risks, voluntary and coerced risks with focus in the nuclear industry.

6810. Topics in Atomic Collisions (3) P: Consent of instructor. Review of processes in atomic collisions and their quantitative understanding, Introduces theories required to
describe experimentally-observed behavior in electron-atom, ion-atom, and/or molecule collisions, and methods of observations. Emphasis on general topics of interest as found in current literature and particular areas of research at ECU Accelerator Laboratory.

6816, 6817. Seminar (1,1) Equivalent of 1 lecture hour per week. Areas of research in progress in physics department.

6900. Introduction to Research (3) Literature and lab research on individual problems in major field.

6992. Radiation Therapy Physics (3) Same as RONC 6992 P: PHYS 6718 or RONC 6718. Radiation dose calculation and measurement of high energy photon and electron beams, high and low dose rate brachytherapy sources in clinical radiation therapy, cavity theory in ion chamber calibrations of photon and electron beams. Quality assurance, acceptance testing, and commissioning of equipment for clinical radiation therapy (linear accelerators, HDR, TLD, simulator, CT scanner).

6993. Clinical and Medical Dosimetry (3) Same as RONC 6993 P: PHYS 6992 or RONC 6992. Practical patient dosimetry problems in radiation oncology. Irregular field calculations, two-and three dimensional treatment planning, isodose distribution, high and low dose rate brachytherapy planning for intracavitary, and interstitial radioactive sources.

7000. Thesis (3) May be repeated. May count maximum of 6 s.h.

7001. Thesis: Summer Research (1) May be repeated. No credit may count toward degree. Students conducting thesis research may only register for this course during the summer.

7110. Mathematics Physics II (3) Formerly PHYS 6100 P: MATH 5311 or PHYS 5311; or consent of instructor. Math methods important in physics. Emphasis on application, including conformal mapping and other applications of functions of complex variables, eigenfunctions, eigenvalues, and Green’s functions, special functions, partial differential equations, boundary value problems, integral equations, calculus of variations, numerical methods, probability and statistics, and group theory.

7310. Electrodynamics II (3) Formerly PHYS 6310 P: PHYS 6300. Advanced electromagnetic theory and related numerical methods, including plane wave and wave propagation, waveguides and resonant cavities, radiating systems, multipole fields and radiation, scattering and diffraction, dynamics of relativistic particles, collisions between charged particles, finite difference methods, moment methods, and finite element method.

7410. Quantum Mechanics II (3) Formerly PHYS 6400 P: PHYS 6410; or consent of instructor. A rigorous, advanced study of the principles of quantum mechanics and their application to selected subfields of physics.

7450. Solid State Physics (3) Formerly PHYS 6450 P: PHYS 6410; or consent of instructor. Coherent picture for understanding complex properties of solids. Topics include periodic structure of crystal lattice, phonons, electronic properties in framework of energy band theory, basic concepts of quasiparticles and their interactions in solid materials.

7715. Biomedical Optics (3) P: Consent of instructor. Fundamental concepts in optics and spectroscopy and to acquire basic skills for modeling and experimental research in selected
biomedical applications.

**7730. Radiation Instrumentation (3)** 1 lecture and 4 lab hours per week. P: PHYS 6700; or consent of instructor. Laboratory study of fundamental concepts in radiation detection and the use of health physics monitoring equipment.

**7740. Special Problems in Radiation Dosimetry and Modeling (3)** P: Consent of instructor. Advanced study of external and internal dosimetry. Assessment of dose from internal and external radiation exposure using analytic and statistical models.

**7992. Clinical Rotation in Radiation Therapy Physics (8)** 1 lecture and 21 practicum hours per week. P: PHYS 6992 or RONC 6992 and consent of assistant chair for graduate studies. Students participate in all aspects of clinical radiation therapy physics, gaining practical expertise in the major clinical applications of radiation to the treatment of disease.

**8526, 8527, 8528. Advanced Readings in Physics I, II, III (1,2,3)** May be repeated for a maximum of 12 s.h. Equivalent of 1 classroom hour per week, per credit hour. P: Consent of assistant chair for graduate studies. Intensive readings at the advanced PhD level in a physics field under supervision of faculty.

**8910. Research Problems in Biomedical Physics (3) Formerly PHYS 6910** May be repeated. P: Consent of instructor and dept chair. Research on specialized topic or topics related to biomedical application of physics under supervision of faculty member.

**9000. Dissertation (3-12)** May be repeated. May count maximum of 18 s.h.

**9001. Dissertation: Summer Research (1)** May be repeated. No credit may count toward degree. Students conducting dissertation research may only register for this course during the summer.

**PHYS Banked Courses**
- 5060. The Conceptual Development of Physics (3)
- 5321. Applied Mathematics I (3)
- 5350. Modern Optics (3)
- 5610. Applied Electromagnetism (3)
- 5630. Gaseous Conductors (3)
- 5640, 5641. Solar Energy (3,0)
- 5710, 5711. Topics in Health Physics I (3,0)
- 5720, 5721. Topics in Health Physics II (3,0)
- 5800. Biophysics (2)
- 6322. Applied Mathematics II (3)
- 6991. Clinical Rotation in Diagnostic Physics (3)