UNIVERSITY FACULTY SENATE FORMS

Academic Program Approval

This form is a routing document for the approval of new and revised academic programs. Proposing department should complete this form. For more information, call the Faculty Senate Office at 831-2921.

Submitted by: _James MacDonald_____phone number_____831-6855___

Department: __Physics and Astronomy_____email address_jimmacd@udel.edu

Action: Revision of course requirement for Ph.D. degree in Physics

(Example: add major/minor/concentration, delete major/minor/concentration, revise major/minor/concentration, academic unit name change, request for permanent status, policy change, etc.)

Effective Term 08F

(use format 04F, 05W)

Current degree____Ph.D._____

(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed change leads to the degree of: ___ Ph.D._____

(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed name:_____

Proposed new name for revised or new major / minor / concentration / academic unit (if applicable)

Revising or Deleting:

Undergraduate major / Concentration:_____

(Example: Applied Music – Instrumental degree BMAS)

Undergraduate minor:_____

(Example: African Studies, Business Administration, English, Leadership, etc.)

Graduate Program Policy statement change:____Physics___Ph.D_____

(**Must attach** your Graduate Program Policy Statement)

Graduate Program of Study:_____

(Example: Animal Science: MS Animal Science: PHD Economics: MA Economics: PHD)

Graduate minor / concentration:_____

Note: all graduate studies proposals must include an electronic copy of the Graduate Program Policy Document, highlighting the changes made to the original policy document.

List new courses required for the new or revised curriculum. How do they support the overall program objectives of the major/minor/concentrations)?
(Be aware that approval of the curriculum is dependent upon these courses successfully passing through the Course Challenge list. If there are no new courses enter "None")

None

Explain, when appropriate, how this new/revised curriculum supports the 10 goals of undergraduate education: http://www.ugs.udel.edu/gened/

Identify other units affected by the proposed changes:
(Attach permission from the affected units. If no other unit is affected, enter "None")

None

Describe the rationale for the proposed program change(s):
(Explain your reasons for creating, revising, or deleting the curriculum or program.)

To make it easier for graduate students to take courses in their area of specialization without increasing the total of required credits. Over the last two years, the Department of Physics and Astronomy has added a number of courses at the 800-level in the various sub-discipline areas. Examples are PHYS822 Quantum Field Theory, PHYS826 Advanced Topics in Condensed Matter Physics, PHYS827 Nuclear Physics I, PHYS833 Astrophysics of Compact Objects, PHYS835 Plasma Physics I: Fluid and MHD. A purpose of these courses is to give graduate students the necessary knowledge and tools to do research in their chosen field. Our current course requirements for regular track students (i.e. those who enter the program without a Master's Degree) include "At least 18 credits must be from among 800-level PHYS courses. Of these 18 credits at the 800 level, 15 credits (i.e. 5 courses) must come from the following group of 6 courses. These courses have to be passed with a grade of B or better.

PHYS 809, PHYS 810
PHYS 811, PHYS 812
PHYS 813, PHYS 815"

Five of these six courses provide a standard and some what dated treatment of core physics, not all of which is needed for a specific sub-discipline. To remove a disincentive for taking the specialized courses, we propose a change to "At least 18 credits must be from among 800-level PHYS courses. Of these 18 credits at the 800 level, **12** credits (i.e. **4** courses) must come from the following group of 6 courses. These courses have to be passed with a grade of B or better.

PHYS 809, PHYS 810
PHYS 811, PHYS 812
PHYS 813, PHYS 815"

Program Requirements:
(Show the new or revised curriculum as it should appear in the Course Catalog. If this is a revision, be sure to indicate the changes being made to the current curriculum and **include a side-by-side comparison** of the credit distribution before and after the proposed change.)

The total number of course credits at the 800-level required of students is not changed.

ROUTING AND AUTHORIZATION: (Please do not remove supporting documentation.)

Department Chairperson _____ Date _____

Dean of College _____ Date _____

Chairperson, College Curriculum Committee _____ Date _____

Chairperson, Senate Com. on UG or GR Studies _____ Date _____

Chairperson, Senate Coordinating Com. _____ Date _____

Secretary, Faculty Senate _____ Date _____

Date of Senate Resolution _____ Date to be Effective _____

Registrar _____ Program Code _____ Date _____

Vice Provost for Academic Programs & Planning _____ Date _____

Provost _____ Date _____

Board of Trustee Notification _____ Date _____

Revised 5/02/06 /khs

FACULTY MEETING MINUTES
Wednesday, April 4, 2007
2:30 pm, 215 Sharp Laboratory

PRESENT:
G. Hadjipanayis (PRESIDING), S. Barr, J. Bieber, S. T. Chui, M. DeCamp, P. Evenson, J. Gizis, H. Glyde, J. Holder, Y. Ji, J. MacDonald, W. Matthaeus, J. Morgan, N. Mulders, B. Nikolic, E. Nowak, S. Pittel, D. Seckel, M. Shay, K. Szalewicz (proxy held by J. Morgan), K. Unruh, B. Walker, J. Xiao, T. Marshall, D. Collins

Quorum is 17 out of 34

1. APPROVED — Minutes of March 21, 2007

2. ANNOUNCEMENTS — Faculty-signed sheets on summer support for graduate student advisees are due April 5, 2007. Also, Myra Focht, Library Assistant, will be leaving the University at the end of April.

3. FOR INFORMATION — The Chair shared comments from Dean and Provost correspondence on Dr. Justin Kasper which acknowledged the Department's choice to change the AMO search to an opportunity to hire Dr. Kasper if Faculty approve. The current hiring plan remains in place in the absence of such approval.

4. APPROVED — The Library Committee moved, W. Matthaeus seconded, a motion on the Physics Branch Library and Physics Demonstrations. The motion reads, "The Department of Physics and Astronomy wish to have the current Physics and Astronomy Reserves expanded to include materials for classroom education and lecture. The new reserve materials should be placed in a searchable collection with the Physics Branch Library. Additional storage space for the expanded reserves will be made available in Sharp Laboratory in Room 128."

   In favor: 19 Opposed: 0 Abstained: 3

5. APPROVED — The Graduate Studies Committee moved on the following recommendation to change wording in the Regulations for Graduate Work in Physics and Astronomy, University of Delaware as appears on the DPA homepage, PhD Degree section, Course Requirements: "Of these 18 credits at the 800 level, **12** credits (i.e., **4** courses) must come from the following group of 6 courses. These courses have to be passed with a grade of B or better. PHYS809, PHYS810, PHYS811, PHYS812, PHYS813, PHYS815." (Currently 15 credits and 5 courses are required.)

   In favor: 15 Opposed: 4 Abstained: 5

6. DISCUSSION — By-law revisions. P. Evenson moved, S. Pittel seconded, a motion to confirm the wording changes to sections 3.1 and 2.3.4 previously approved at the December 13, 2006 Faculty Meeting. The motion was passed without objections. The Faculty discussed Draft Appendix A on CNTT Faculty. Further discussion prior to a By-laws revision vote will continue at the next meeting.

Next Faculty meeting is scheduled for Wednesday, April 18, 2007, 2:30PM, 215 Sharp Lab.

REGULATIONS FOR GRADUATE WORK IN PHYSICS UNIVERSITY OF DELAWARE

April 20, 2007

INTRODUCTION

The Department of Physics and Astronomy (DPA) offers a graduate program leading to the M.S. or Ph.D. degrees in Physics. This manual provides an outline of the requirements for these degrees. Many aspects of graduate work at the University of Delaware are covered by University regulations and can be found in the Academic Regulations for Graduate Students which is part of the Undergraduate and Graduate Catalog.

Nearly all graduate students in the program are at some point or another supported as Teaching Assistants. Valuable information about being a Teaching Assistant can be found in the TA Handbook, issued by the Center for Teaching Effectiveness. This handbook also provides a convenient summary of University policies that apply to the appointment of graduate teaching assistants.

Other useful information, on matters such as campus life, computer technology on campus, policies on responsible computing, resources for foreign students, as well as a very convenient index can be found at a website maintained specifically for current graduate students.

Material regarding the admissions process can be found in the relevant sections of the graduate catalog and on the DPA website.

DEGREE REQUIREMENTS

M.S. DEGREE

Students may choose to obtain an MS degree with or without thesis.

- The MS without thesis degree requires 30 credit hours in PHYS courses, including at most 3 credits of research (PHYS 868). At least 6 credits of classroom courses must be at the PHYS 800 level.
  In addition, the degree candidate will survey the literature on a current topic in physics or astronomy, write a report on this topic and make a public presentation to the department, represented by three members of its faculty (appointed by the Director of the Graduate Program with approval of the Chair of the Department).

- The MS with thesis requires 24 credits hours in PHYS courses, including at most 3 credits of research (PHYS 868). At least 6 credits of classroom courses must be at the PHYS 800 level. In addition 6 credits of thesis work (PHYS 869) are required. The purpose of the M.S. thesis is to demonstrate that the student can conduct research under supervision and communicate the results clearly in English. The thesis is defended in an oral examination administered by a committee of three members of the Department.

Approval of the graduate review committee is required if more than 6 credits are from departments other than physics or if any are in a discipline unrelated to physic

Ph.D. DEGREE

Students may enter the Ph.D. program after successfully completing an M.S. degree program, at the University of Delaware or elsewhere, or may be admitted directly to the Ph.D. program directly after a Bachelors degree. To obtain a Ph.D., students will normally follow the course intensive *regular track*. Students entering the program with an M.S. degree in Physics or Astronomy that are particularly well prepared may choose to follow the less coursework intensive *fast track*.

Course requirements:

Students on the ***regular track*** must satisfy the following course requirement:

> Taking and passing, with an average grade of 3.0 or better, 30 credits of course work within the first five semesters after entering graduate school. At least 18 credits must be from among 800-level PHYS courses. Of these 18 credits at the 800 level, 15 credits (i.e. 5 courses) must come from the following group of 6 courses. These courses have to be passed with a grade of B or better.
>
> PHYS 809, PHYS 810
> PHYS 811, PHYS 812
> PHYS 813, PHYS 815

Students following the ***fast track*** must meet the following course requirements to remain on that track:

> Taking at least 12 credits of PHYS classroom courses at the 800-level within their first year. (Also note that students who have not passed the candidacy exam must take at least 5 PHYS courses in their first year.)

All students in the Ph.D. program are required to complete 9 credits of doctoral dissertation (PHYS 969)

Course credit earned at the University of Delaware to obtain an MS in Physics may be applied toward the doctoral degree. Students on the regular track may, with approval of the Graduate Review Committee, apply graduate course credits earned elsewhere, but not used to obtain a previous degree, toward the doctoral degree to a maximum of 9 credits.

Ph.D. Candidacy Exam:

The written part of the candidacy exam: All students in the Ph.D. program must pass the written part of the Ph.D. candidacy exam at the latest at the next offering of the exam after the end of their third semester in the graduate program. Students must pass each of the parts of the exam separately, not necessarily at the same sitting.

If a student on the fast track has not passed the written part of the exam after two semesters, the Graduate Review Committee will promptly review the student's progress and issue a determination whether the student should remain on the fast track or should shift to the regular track.

The written part of the examination is given twice per year. It is an exam covering four subjects, mechanics, electricity and magnetism, statistical mechanics and thermodynamics, and quantum mechanics (coinciding with the course content of PHYS 620, Classical Mechanics, PHYS 603/604, Electricity and Magnetism, PHYS616, Thermodynamics and Statistical Mechanics, and PHYS610, Quantum Mechanics). A score of 65% or more is an automatic pass and a score less than 55% is an automatic failure. The pass mark for scores between 55% and 65% will be determined by the faculty following each exam. The exam is made up of questions selected by the PhD Candidacy Exam Committee. All faculty take part in the grading, with each question graded by two people independently. The chair of the committee reviews all grades and asks the graders to resolve any serious disagreements about grades.

The oral candidacy examination: Within 18 months after passing the written part of the Ph.D. candidacy exam, a Ph.D. candidate shall make an oral presentation on the proposed dissertation research to a committee consisting of the members of the Ph.D. dissertation committee and two additional members appointed by the director of the graduate program. This committee shall examine the students in matters regarding the proposed research program. A student who fails the examination has one opportunity to retake the exam. This has to take place within 6 month of the original examination.

Ph.D. Upon successful completion of a research program, the PhD candidate will write a dissertation showing originality of thought and scholarship, properly expressed in English. The dissertation is defended in an oral examination administered by the student's dissertation (doctoral) committee (see below). The committee may require that changes or revisions be made to the dissertation. The final oral examination is not considered to have been passed until the dissertation revisions have satisfied the committee. In general, doctoral committees should strive to achieve consensus concerning the student's performance and quality of work. In the case of dissenting votes, the majority opinion rules and a majority vote in favor is needed for a successful defense.

Role of the Ph.D. committee:

- Within six months of passing the written part of the Ph.D. Candidacy Examination, the candidate, together with his/her advisor, should decide upon the composition of the dissertation committee.
- The PhD candidate should provide the members of the Ph.D. committee with an annual report (due May 15) outlining the progress made and plans for the following year. At least six months prior to the anticipated defense of the dissertation, the candidate will make a careful written and oral presentation to the dissertation committee, which may advise upon the final stages.

Composition of the Ph.D. committee: It is the policy of the University's Graduate Program that each dissertation committee will consist of between four and six members.

- At least one committee member will be drawn from an academic unit other than the department of the advisor, or from an institution or organization external to the University.
- The chair of the committee is the faculty member in charge of the candidate's research and dissertation.
- At least one member of the committee will be a member of the DPA faculty from a research area distinct from that of the candidate. For this purpose, the distinct research areas are: 1) Astronomy & Astrophysics, 2) Atomic, Molecular and Optical Physics, 3) Condensed Matter & Material Physics, 4) Particle Physics, 5) Nuclear Physics, and 6) Space Physics.
- At least one member of the committee will be from the DPA faculty.

The members who satisfy the various requirements need not be distinct.

Summary of degree requirements

Degree	Total course credits	800 level credits	Dissertation credits
Reg. Track Ph.D.	30	18	9 (PHYS 969)
Fast track Ph.D.	12	12	9 (PHYS 969)

Summary of time limits

Degree	Time for completion of the degree	Time for passing the written part of the Ph.D. candidacy exam	Time for passing the oral part of the Ph.D. candidacy exam
Reg. Track	7 years	1 ½ years	3 ½

Ph.D.			
Fast track Ph.D.	5 years	1 ½ years	3 ½

GENERAL RULES of the PROGRAM

Enrolment: In order to remain in good standing in the DPA graduate program, each full-time Master's candidate must take at least six credit hours of 600 or 800 level PHYS courses during each semester, maintaining in these PHYS credit hours a cumulative GPA of 3.0 or better, until he/she has fulfilled the course requirements for the Master's degree. Ph.D. candidates must continue taking six or more credit hours of 600 or 800 level PHYS course work in each semester until they have passed the written part of the Ph. D. Candidacy Exam, maintaining in these PHYS credit hours a GPA of 3.0 or better. Courses designated as pass/fail and courses in research or in thesis/dissertation do not satisfy the six PHYS credit hour per semester course requirement and are not considered in computing the required grade point average.

In addition the following rules apply:

- Approval of the Graduate Review Committee is required if more than six classroom credit hours are from departments other than Physics and Astronomy, or for any credit hours in a discipline unrelated to Physics.
- First year students will register for PHYS 600/800 courses only.
- All full-time first-year graduate students who have not yet passed the written part of the candidacy exam are required to take for credit in their first year at least 5 classroom PHYS courses at the 600- or 800-level.

Advisement: The Director of the Graduate Program functions as the initial advisor for the first year students. Students are encouraged to select a research advisor early, and must formally identify one (subject to possible change later) by May 15 to be eligible for financial support during summer. They are assisted in their choice of research area and research advisor by a one credit pass/fail course, PHYS 600, in which members of the faculty presents brief, informal descriptions of their research programs. Students are also encouraged to broaden their awareness of current research by attending the DPA colloquia and graduate student research talks.

Progress towards a graduate degree: A reasonable goal for a well-prepared graduate student is the completion of an M.S. degree within two years from the time of first entering graduate school, and the completion of a Ph.D. degree within four to five years if the student enters with an MS or six to seven years when entering with a BS. In order to extend support beyond the time limits of five respectively seven years, the Graduate Student Review Committee would have to take positive action. It is in the student's interest to complete a degree as soon as possible insofar as is consistent with work of

good quality. Thus every effort is made to encourage a student and his or her advisor to design a degree program which can be completed within these time limits. In the event that extensions of support are needed, a student and his or her advisor should submit a written request to the Graduate Review Committee as soon as the need for extra time becomes clear.

Students who fail to pass the written part of the candidacy exam within 1 ½ years may request transfer to the MS program, as may those who fail to pass the oral part.

The Graduate Review Committee meets immediately after the end of Spring semester to examine the time table for all students. The committee reviews their status regarding progress and financial support, and thereupon provides written reports to the students, their research advisers and to the Director of the Graduate Program.

Good Academic Standing: To be considered in good academic standing, a student must maintain a minimum cumulative graduate grade point average (GPA) of 3.00 on a 4.00 scale each semester. To be eligible for an advanced degree, a student's cumulative grade point average shall be at least a 3.00. A grade below a C- will not be counted toward the course requirements for a degree but is calculated in the student's cumulative grade point average.

Arbitration: In those instances in which difficulties arise in communications between a student, the advisor, and/or the Graduate Review Committee, informal consultation with the Director of the Graduate Program may be helpful. Should this avenue fail to restore healthy communication, the matter may be considered by the entire Graduate Studies Committee.

GRADUATE STUDENT TEACHING AND FINANCIAL SUPPORT

Students who are awarded fellowships or assistantships assume a contract with the University. The University agrees to provide a scholarship for the student's tuition and pay a stipend. As with any professional appointment, the amount of service may vary but the average is usually expected to be 20 hours per week. Continuation of the appointment is contingent upon satisfactory performance of assigned duties, continued academic eligibility and compliance with the University's Code of Ethics.

Eligibility for financial support: The University will not permit support of a student who has not obtained a 3.00 (B) grade-point average in graduate-level courses. The department may request a one-semester temporary continuation of support for a student whose grade-point average has fallen slightly below 3.0.

A student must be classified as full-time to be eligible to hold an assistantship or fellowship. Students holding a teaching assistantship, a research assistantship, a graduate assistantship, a tuition assistantship, or a tuition scholarship must register for at least 6 credit hours of graduate-level courses each fall and spring semester to meet full-time status. Students holding a fellowship must register for at least 9 credit hours. Students on contract in fall or spring semester who are completing a thesis or a dissertation may register in sustaining credit to meet full-time status.

SUMMER REGISTRATION. Students who are supported by the University as teaching assistants, research assistants, or fellows during the summer months are required to be registered for at least three credits during this period. Students may register in 868 (research), 869 (thesis), 969 (dissertation), sustaining, or a regular course offered in summer session. Except for 869, 969, or regular courses, grades assigned are pass/fail.

TA training: First-time recipients of Teaching Assistantships in the DPA are required to attend the Annual Conference for Graduate Teaching Assistants offered by the Center for Teaching Effectiveness. They are required also to participate in a one-credit pass/fail course, PHYS 601 *Introduction to Teaching Physics and Astronomy*. International TAs must also attend the ELI/ITA training program and meet the SPEAK/UDIA score requirements to be eligible for a TA appointment

Teaching in winter session: Students supported as TAs in Winter Session will have a teaching assignment amounting to one section. Provided their (research) advisor approves, both TAs and RAs may request to be TA for one (additional) section, for which the student will be paid an additional stipend. Past teaching effectiveness will be used to determine the allocation of these sections. RAs may not be assigned more than one section.

Instructorships: Some students may be offered positions as lecturers in Summer or Winter Sessions. In order to lecture, a student must have passed the written and oral parts of the candidacy exam, or have obtained a Master's degree, or have shown other convincing evidence of competence. In addition, lecturers will be expected to have shown high teaching ability, using student evaluations and classroom visits by DPA faculty members as evidence. Research Assistants may not spend more than 20 hours per week teaching in Winter Session and therefore may not hold instructorships.

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April 20, 2007

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DEGREE REQUIREMENTS

M.S. DEGREE

Students may choose to obtain an MS degree with or without thesis.

- The MS without thesis degree requires 30 credit hours in PHYS courses, including at most 3 credits of research (PHYS 868). At least 6 credits of classroom courses must be at the PHYS 800 level.
  In addition, the degree candidate will survey the literature on a current topic in physics or astronomy, write a report on this topic and make a public presentation to the department, represented by three members of its faculty (appointed by the Director of the Graduate Program with approval of the Chair of the Department).

- The MS with thesis requires 24 credits hours in PHYS courses, including at most 3 credits of research (PHYS 868). At least 6 credits of classroom courses must be at the PHYS 800 level. In addition 6 credits of thesis work (PHYS 869) are required. The purpose of the M.S. thesis is to demonstrate that the student can conduct research under supervision and communicate the results clearly in English. The thesis is defended in an oral examination administered by a committee of three members of the Department.

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Course requirements:

Students on the ***regular track*** must satisfy the following course requirement:

> Taking and passing, with an average grade of 3.0 or better, 30 credits of course work within the first five semesters after entering graduate school. At least 18 credits must be from among 800-level PHYS courses. Of these 18 credits at the 800 level, 12 credits (i.e. 4 courses) must come from the following group of 6 courses. These courses have to be passed with a grade of B or better.
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> PHYS 809, PHYS 810
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> PHYS 813, PHYS 815

Deleted: 15

Deleted: 5

Students following the ***fast track*** must meet the following course requirements to remain on that track:

> Taking at least 12 credits of PHYS classroom courses at the 800-level within their first year. (Also note that students who have not passed the candidacy exam must take at least 5 PHYS courses in their first year.)

All students in the Ph.D. program are required to complete 9 credits of doctoral dissertation (PHYS 969)

Course credit earned at the University of Delaware to obtain an MS in Physics may be applied toward the doctoral degree. Students on the regular track may, with approval of the Graduate Review Committee, apply graduate course credits earned elsewhere, but not used to obtain a previous degree, toward the doctoral degree to a maximum of 9 credits.

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If a student on the fast track has not passed the written part of the exam after two semesters, the Graduate Review Committee will promptly review the student's progress and issue a determination whether the student should remain on the fast track or should shift to the regular track.

The written part of the examination is given twice per year. It is an exam covering four subjects, mechanics, electricity and magnetism, statistical mechanics and thermodynamics, and quantum mechanics (coinciding with the course content of PHYS 620, Classical Mechanics, PHYS 603/604, Electricity and Magnetism, PHYS616, Thermodynamics and Statistical Mechanics, and PHYS610, Quantum Mechanics). A score of 65% or more is an automatic pass and a score less than 55% is an automatic failure. The pass mark for scores between 55% and 65% will be determined by the faculty following each exam. The exam is made up of questions selected by the PhD Candidacy Exam Committee. All faculty take part in the grading, with each question graded by two people independently. The chair of the committee reviews all grades and asks the graders to resolve any serious disagreements about grades.

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Role of the Ph.D. committee:

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- The PhD candidate should provide the members of the Ph.D. committee with an annual report (due May 15) outlining the progress made and plans for the following year. At least six months prior to the anticipated defense of the dissertation, the candidate will make a careful written and oral presentation to the dissertation committee, which may advise upon the final stages.

Composition of the Ph.D. committee: It is the policy of the University's Graduate Program that each dissertation committee will consist of between four and six members.

- At least one committee member will be drawn from an academic unit other than the department of the advisor, or from an institution or organization external to the University.
- The chair of the committee is the faculty member in charge of the candidate's research and dissertation.
- At least one member of the committee will be a member of the DPA faculty from a research area distinct from that of the candidate. For this purpose, the distinct research areas are: 1) Astronomy & Astrophysics, 2) Atomic, Molecular and Optical Physics, 3) Condensed Matter & Material Physics, 4) Particle Physics, 5) Nuclear Physics, and 6) Space Physics.
- At least one member of the committee will be from the DPA faculty.

The members who satisfy the various requirements need not be distinct.

Summary of degree requirements

Degree	Total course credits	800 level credits	Dissertation credits
Reg. Track Ph.D.	30	18	9 (PHYS 969)
Fast track Ph.D.	12	12	9 (PHYS 969)

Summary of time limits

Degree	Time for completion of the degree	Time for passing the written part of the Ph.D. candidacy exam	Time for passing the oral part of the Ph.D. candidacy exam
Reg. Track	7 years	1 ½ years	3 ½

Ph.D.			
Fast track Ph.D.	5 years	1 ½ years	3 ½

GENERAL RULES of the PROGRAM

Enrolment: In order to remain in good standing in the DPA graduate program, each full-time Master's candidate must take at least six credit hours of 600 or 800 level PHYS courses during each semester, maintaining in these PHYS credit hours a cumulative GPA of 3.0 or better, until he/she has fulfilled the course requirements for the Master's degree. Ph.D. candidates must continue taking six or more credit hours of 600 or 800 level PHYS course work in each semester until they have passed the written part of the Ph. D. Candidacy Exam, maintaining in these PHYS credit hours a GPA of 3.0 or better. Courses designated as pass/fail and courses in research or in thesis/dissertation do not satisfy the six PHYS credit hour per semester course requirement and are not considered in computing the required grade point average.

In addition the following rules apply:

- Approval of the Graduate Review Committee is required if more than six classroom credit hours are from departments other than Physics and Astronomy, or for any credit hours in a discipline unrelated to Physics.
- First year students will register for PHYS 600/800 courses only.
- All full-time first-year graduate students who have not yet passed the written part of the candidacy exam are required to take for credit in their first year at least 5 classroom PHYS courses at the 600- or 800-level.

Advisement: The Director of the Graduate Program functions as the initial advisor for the first year students. Students are encouraged to select a research advisor early, and must formally identify one (subject to possible change later) by May 15 to be eligible for financial support during summer. They are assisted in their choice of research area and research advisor by a one credit pass/fail course, PHYS 600, in which members of the faculty presents brief, informal descriptions of their research programs. Students are also encouraged to broaden their awareness of current research by attending the DPA colloquia and graduate student research talks.

Progress towards a graduate degree: A reasonable goal for a well-prepared graduate student is the completion of an M.S. degree within two years from the time of first entering graduate school, and the completion of a Ph.D. degree within four to five years if the student enters with an MS or six to seven years when entering with a BS. In order to extend support beyond the time limits of five respectively seven years, the Graduate Student Review Committee would have to take positive action. It is in the student's interest to complete a degree as soon as possible insofar as is consistent with work of

good quality. Thus every effort is made to encourage a student and his or her advisor to design a degree program which can be completed within these time limits. In the event that extensions of support are needed, a student and his or her advisor should submit a written request to the Graduate Review Committee as soon as the need for extra time becomes clear.

Students who fail to pass the written part of the candidacy exam within 1 ½ years may request transfer to the MS program, as may those who fail to pass the oral part.

The Graduate Review Committee meets immediately after the end of Spring semester to examine the time table for all students. The committee reviews their status regarding progress and financial support, and thereupon provides written reports to the students, their research advisers and to the Director of the Graduate Program.

Good Academic Standing: To be considered in good academic standing, a student must maintain a minimum cumulative graduate grade point average (GPA) of 3.00 on a 4.00 scale each semester. To be eligible for an advanced degree, a student's cumulative grade point average shall be at least a 3.00. A grade below a C- will not be counted toward the course requirements for a degree but is calculated in the student's cumulative grade point average.

Arbitration: In those instances in which difficulties arise in communications between a student, the advisor, and/or the Graduate Review Committee, informal consultation with the Director of the Graduate Program may be helpful. Should this avenue fail to restore healthy communication, the matter may be considered by the entire Graduate Studies Committee.

GRADUATE STUDENT TEACHING AND FINANCIAL SUPPORT

Students who are awarded fellowships or assistantships assume a contract with the University. The University agrees to provide a scholarship for the student's tuition and pay a stipend. As with any professional appointment, the amount of service may vary but the average is usually expected to be 20 hours per week. Continuation of the appointment is contingent upon satisfactory performance of assigned duties, continued academic eligibility and compliance with the University's Code of Ethics.

Eligibility for financial support: The University will not permit support of a student who has not obtained a 3.00 (B) grade-point average in graduate-level courses. The department may request a one-semester temporary continuation of support for a student whose grade-point average has fallen slightly below 3.0.

A student must be classified as full-time to be eligible to hold an assistantship or fellowship. Students holding a teaching assistantship, a research assistantship, a graduate assistantship, a tuition assistantship, or a tuition scholarship must register for at least 6 credit hours of graduate-level courses each fall and spring semester to meet full-time status. Students holding a fellowship must register for at least 9 credit hours. Students on contract in fall or spring semester who are completing a thesis or a dissertation may register in sustaining credit to meet full-time status.

SUMMER REGISTRATION. Students who are supported by the University as teaching assistants, research assistants, or fellows during the summer months are required to be registered for at least three credits during this period. Students may register in 868 (research), 869 (thesis), 969 (dissertation), sustaining, or a regular course offered in summer session. Except for 869, 969, or regular courses, grades assigned are pass/fail.

TA training: First-time recipients of Teaching Assistantships in the DPA are required to attend the Annual Conference for Graduate Teaching Assistants offered by the Center for Teaching Effectiveness. They are required also to participate in a one-credit pass/fail course, PHYS 601 *Introduction to Teaching Physics and Astronomy*. International TAs must also attend the ELI/ITA training program and meet the SPEAK/UDIA score requirements to be eligible for a TA appointment

Teaching in winter session: Students supported as TAs in Winter Session will have a teaching assignment amounting to one section. Provided their (research) advisor approves, both TAs and RAs may request to be TA for one (additional) section, for which the student will be paid an additional stipend. Past teaching effectiveness will be used to determine the allocation of these sections. RAs may not be assigned more than one section.

Instructorships: Some students may be offered positions as lecturers in Summer or Winter Sessions. In order to lecture, a student must have passed the written and oral parts of the candidacy exam, or have obtained a Master's degree, or have shown other convincing evidence of competence. In addition, lecturers will be expected to have shown high teaching ability, using student evaluations and classroom visits by DPA faculty members as evidence. Research Assistants may not spend more than 20 hours per week teaching in Winter Session and therefore may not hold instructorships.
