



INFORMATION AND POLICY GUIDE

FOR
GRADUATE STUDENTS
IN
PHYSICS

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COMPILED BY:

THE GRADUATE PROGRAM AND ADMISSIONS
COMMITTEE,
THE GRADUATE COORDINATOR,
AND THE CHAIRPERSON,
DEPARTMENT OF PHYSICS,
KENT STATE UNIVERSITY

PREFACE

This Information and Policy Guide is issued principally for the benefit of the graduate students in the Department of Physics at Kent State University. All graduate students are expected to be familiar with its contents and to abide by the stated rules. In addition, faculty will find the Guide a useful reference, particularly with regard to curriculum advising and thesis and dissertation procedures.

The information in this guide is the result of deliberations of the Faculty and the Graduate Program and Admissions Committee of the Department of Physics. Refer to the Physics Department Committees assignment sheet, which is distributed to all faculty and graduate students each fall, for the membership of these committees. The Graduate coordinator chairs the Graduate Program and Admissions Committee.

Since it is difficult to write rules that will apply to every case, special consideration will be given by the committee to individual cases when rules and guidelines in this document do not adequately apply.

The Physics Department and its committees reserve the right to make alterations and additions to policy. When such alterations or additions are made which affect graduate students, they will be communicated to the graduate students, their advisors, or their representatives.

One of the principal goals of the Physics Department is to become and remain a leading department in the state and the nation. Since graduate students are members of the Department, quality of performance and productivity by graduate students is very important. Contributions and constructive suggestions by graduate students toward these goals are welcome.

This is your department. Help us make it the best possible.

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1. ACADEMIC PROGRAMS

1-1. Doctoral Program

A Ph.D. student takes approximately two academic years and one summer of full-time course work (*see Course Schedules*), takes the candidacy exam (*see Candidacy Exam*), completes a dissertation and defends it in an oral exam (*see Dissertation*), and presents a colloquium based on his/her work to the Physics community (*see Colloquium Requirement*). Research for the dissertation usually begins in the second spring. The Graduate Program Committee approves the selection of the research advisor and the Dissertation Committee.

Since the Ph.D. is a research degree, the learning of research techniques and the completion of a satisfactory research project are perhaps the most important steps. The personal characteristics of having self-discipline, motivated, ability to organize research, recognition of the significance of results, staying current in one's research area, and the capability of spending extended hours in the laboratory or poring over a problem aid the candidate in the completion of the dissertation.

The national average for the time required to obtain a Ph.D. degree in physics after the bachelor's degree is approximately six and one-half years. It is desirable for Ph.D. students to complete their work earlier, if possible, since they can then enter professional life, begin applying the knowledge and techniques learned in graduate school, and obtain a larger salary than that of a graduate assistant! Financial support of Graduate Assistants and Teaching Fellows working toward the doctorate is limited to 173 semester-hours of graduate work (*see Section 7-5*). The Physics Department bases its financial support of an appointee on satisfactory progress toward the degree. The expectation is that the student will complete the Ph.D. degree in about five years after receiving the bachelor's degree. After two academic years and one summer of formal course work, research work to complete a doctoral dissertation typically takes three years. Students in the Ph.D. program (and in the master's programs who wish to enter the Ph.D. program) are reviewed at the end of each term by the Graduate Program and Admissions Committee for the continuation of financial support (*see Financial Support, Section 7*).

1-2. Master's Degree Program

The M.A. degree is a non-thesis option, whereas the M.S. degree requires a thesis. It is expected that a student will complete the requirements for the M.A. in a calendar year, and the M.S. within three semesters (plus one summer term).

The minimum credit-hour requirement for the Master's degree is 32 credit-hours of graduate courses with no more than one-half at the 50000 level. The course schedule for the students pursuing the master's degree is essentially the same as for the first year of the Ph.D. program.

1-3. Graduation Requirements

The policy regarding graduate requirements is stated in the *Graduate Catalog*. The student is allowed to follow the policy in any Kent State University graduate catalog dated since the date the student entered continuous graduate work at Kent State. The prospective graduate must inform the Office of Graduate Studies of the College of Arts and Sciences well in advance of graduation of his/her intent to graduate, must fill out appropriate forms and meet the deadlines for graduation at the end of a specific term. In addition, the student must be continuously registered until the term of graduation. The student's advisor, the Graduate Program and Admissions Committee, and the Office of the Associate Dean for Graduate Affairs in the College of Arts and Sciences check the student's record to see if all requirements have been fulfilled and the proper deadlines have been met.

2. CURRICULAR AND RELATED REQUIREMENTS

2-1. Optional Diagnostic Candidacy Exam (Free shot)

All entering graduate students are given an opportunity to pass the Candidacy Examination (see Section 3.1) in the beginning of their first semester at Kent. The results of this will assist the students and his/her curriculum advisor in proper course selection.

A failing score on this attempt will not be recorded in the student's permanent file and will in no way affect the student's standing in the Department. It is however highly recommended that a student who fails any of the four sections of the exam must register for the course corresponding to the failed particular section. Students will have two additional opportunities to take and pass the Candidacy Examination as discussed in Section 3-1.

In case of a successful attempt, the student will of course be considered to have passed the exam and should consult with his/her curriculum advisor about registering for the courses typically taken during the second year.

2-2. Course Schedules for Physics Graduate Programs

In the following pages, course schedules for students pursuing pre-doctoral or M.S. degree programs assume that the students have preparation equivalent to that of a Kent State Bachelor of Science degree in Physics. A student's curriculum advisor can help with any questions regarding the course selection and schedule. The following upperclass courses (or their equivalent) in the Kent B.S. program are expected to have been taken in undergraduate school with a satisfactory grade: Mechanics (35101/2), Thermodynamics (4/55301), Introductory Modern Physics (36001), Quantum and Atomic Physics (4/56101), Introduction to Nuclear Physics (4/56301), Electromagnetic Theory I and II (4/55201, 4/55202), and Introduction to Solid State Physics (4/56401).

Each new graduate student must obtain a copy of the course schedules from the departmental office. The student and his/her curriculum advisor together plan the student's course schedule before registration. After reviewing the student's transcript and background, and the performance in the diagnostic exam if taken by the student, the curriculum advisor and the student work out the details of the projected schedule of courses for each term to receipt of degree and indicate during which term the

student should take the Candidacy Exam. If a student is admitted initially to a master's degree program, and wishes to be considered later for admission to a doctoral degree program, then the student needs to plan and submit a course schedule projected also to the receipt of the doctoral degree. Projected course schedules may be reviewed each term and revised as necessary. The student and the advisor must sign the planned course schedule and submit it to the Graduate Program Coordinator for approval before registration.

It may be advantageous to make changes in approved course schedules. To affect such changes, a graduate student must obtain advance approval from both his advisor and the Graduate Coordinator. It is expected that a graduate student will typically take three *formal** graduate courses per term. In certain circumstances, it may be possible and desirable for a student to engage in research before completing formal course work. A graduate student in a doctoral program may perform research instead of a formal course, provided that the reduced formal course program neither interferes with the completion of formal prescribed courses within nor extends the number of terms for formal courses beyond two academic years and one summer term. The research work must be planned in conjunction with the faculty research advisor and receive a written approval of the Graduate Coordinator in advance of registration. If the research advisor is not the dissertation advisor, then the course schedule must be approved by the curriculum advisor.

Students who have at least 32 semester hours of graduate course work at Kent State University, or who have a master's degree from a recognized university in the United States, should register in the higher level (6/70000 or 6/80000) sequence of courses; other students should register for 60000 level courses. Transfer student may apply to the Graduate Coordinator for a waiver of required core course(s) based on the same course work satisfactorily completed at a recognized university (with at least a "B" grade) and passing pertinent part of the Candidacy Examination. Requests for a course waiver should be addressed to the Graduate Program and Admissions Committee and submitted to the Graduate Coordinator. Evidence of previously taking the course, a satisfactory grade, and the syllabus should be submitted with the request. The request should be discussed and endorsed by the advisor and submitted well in advance so that the course in question can still be taken as scheduled, should the waiver not be granted.

The sample course schedule shown on the next page lists the typical first and second year courses. Alternative fall and spring courses that may be selected from the course list on page 6 depending on the student's background. Required courses are indicated by + (*see also Section 3-3*).

Course names and numbers for advising schedules

Undergraduate Senior Level Courses

Course Name	Number	Semester	Hours	Course offered during the following terms:		
				M 05	F 05	S 06
Advanced Physics Lab	4/50020		1		X	
Variable Title Wkshp in Physics	50093		1-6			
Special Topic	50095		1-3	III		X
Individual Investigation	50096		1-3	I, III	X	X
Special Topics	50195		1-3			
Applied Physics Lab	52020		2			
General Electronic Instrumentation	52512		4			
Computer Systems Design	52513	Spring	3			
Planetarium Oper. & Program	54291		1		X	X
Astrophysics	4/54802		3			X
Electromagnetic Theory I	55201	Fall			X	
Electromagnetic Theory II	55202	Spring	3			X
Thermodynamics	4/55301		3		X	
Computer Analysis Of Exp. Measurement	55403		2			
Fundamentals of Modern Optics	55501		3			X
Microprocessor-Based design	55612		3			
Quant. & Atomic Phys	4/56101		4			X
Intro to Nuclear Physics	56301		3			X
Intro. to Sol Stat. Phys (Last scheduled Sp 03)	4/56401		3			

Graduate Level Courses

Classical Mechanics	6/75101	Fall	3		X	
+Classical Electrodynamics I	6/75203	Spring	3			X
+Classical Electrodynamics II	6/75204	Fall	3		X	
Nuclear Physics	6/76302		3			
Quantum Mechanics I	6/76161	Fall	3		X	
+Quantum Mechanics II	6/76162	Spring	3			X
+Quantum Mechanics III	76163	Fall	3		X	
+Solid State I (Last held Sum 04)	6/76401	Summer	3	II		
Solid State II	6/76402		3			
+Statistical Mechanics I	6/75301		4		X	
Statistical Mechanics II	75302		3			
+Particle Physics	6/76201	Spring	3			X
*Liquid Crystal Physics	6/78401	Spring	3			X
*Adv. Nuclear Physics (Last held Sp 03)	76303	Spring	3			
*Adv. Condensed Matter Physics	76403	Spring	3			X
New Course Offered Summer 05 Adv. Prob. Solv	64101	Summer	3	II		
College Teaching of Physics	6/70094	Fall/Spring	1-3		X	X
Research	6/80098	Fall/Spring	1-15	II	X	X
Special Topics(SEE Advanced Topics)	6/70295	Fall	1-3	II	X	
Physics Seminar	6/80091	Fall/Spring	1		X	X
Physics Colloquium	80097	Fall/Spring	1		X	X
Advanced Topics	6/70295				X	X
Advanced Topics	6/70395		1-3		X	
Variable title wkshp in physics	6/70093		1-6			
Thesis I	60199	Fall/Spring	2-6	II	X	X
Thesis II	60299	Fall/Spring	2	II	X	X
Dissertation I	80199	Fall/Spring	15	II	X	X
Dissertation II	80299	Fall/Spring	1 or 15	II	X	X

+ Course required for PhD program

*One of these 3 courses must be taken for requirement

Graduate Advisory Sheet

NAME: _____

ADVISOR: _____

Year 1: Fall Semester

Course #	Course Name	Hours
6/75101	Classical Mechanics (3)	
6/76161	Quantum Mechanics I (3)	
•6/75301	Statistical Mechanics (4)	

Total Semester Hours

Year 1: Spring Semester

Course #	Course Name	Hours
•6/76162	Quantum Mechanics II (3)	
•6/75203	Classical Electro. I (3)	
•6/76201	Particle Physics (3)	

Total Semester Hours

Year 1: Summer

Course #	Course Name	Hours
6/74101	Advanced Prob. Solving (3)	
80098	Research	

Total Semester Hours

Fall Semester 4/5 Courses

Course #	Course Name	Hours
44600	Intro to Biological Phys. (ODD) (3)	
4/55201	Electromagnetic Theory(4)	
4/55401	Math. Methods in Physics (EVEN) (4)	

Year 2: Fall Semester

Course #	Course Name	Hours
•6/75204	Classical Electro. II (3)	
•6/76401	Solid State (3)	
•76163	Quantum Mechanics III (3)	

Total Semester Hours

Year 2: Spring Semester

Course #	Course Name	Hours
•6/78401	Liquid Crystal (3) OR	
•76403	Adv. Cond. Matte (3) OR	
•76303	Adv. Nuclear (3)	
6/80098	Research	
	•only 1 of the above is required (excluding research)	

Total Semester Hours

• = required courses for PhD.

Spring Semester 4/5 Courses

Course #	Course Name	Hours
4/54802	Astrophysics (EVEN) (3)	
4/55301	Thermal Physics (3)	
4/55403	Data Analysis & Comp.Phys. (ODD) (3)	
4/55501	Electromagnetic Waves and Modern Optics (EVEN) (3)	
4/56101	Quantum and Atomic Phys. (4)	
4/56301	Intro to Nuclear (EVEN) (3)	
4/56401	Intro to Solid State (Odd) (3)	
4/51010	Biophotonics (3) (ODD)	

2-3. Special Courses and Their Requirements

2-3.1. Attendance of Colloquia and Seminars

All graduate students are expected to attend Colloquia and Seminars in the department. Normally, seminars are given by Physics faculty, graduate students, and invited speakers, and deal with specialized areas of research. Colloquia are presented by outside speakers who are invited to speak on their research. Colloquia are normally on a general level, accessible by all faculty and graduate students.

2-3.2. College Teaching of Physics

Graduate Assistants and Teaching Fellows are required by the Physics Department to take College Teaching of Physics (Physics 6/70094) for one semester of credit. The training received will help the student in his/her teaching duties and in his/her career after graduation. Graduate Students who are assigned to teach undergraduate laboratories under a faculty member's supervision may register for this course.

2-4. The "16-Hour" Requirement

In order for the faculty to have an opportunity to observe a student's performance, each doctoral student must take and pass 16 hours of formal physics courses at the 6/70000 level at Kent. The presentation of a seminar (80091) may be used to satisfy one hour of the 16-hour requirement. It is the responsibility of each student to establish that he or she has satisfied the 16-hour requirement. The 16-hour requirement is not a prerequisite for the candidacy examinations.

2-5. Continuous Registration Requirement

Doctoral students who have reached the dissertation stage of their graduate work are required to register each term (fall, spring, and summer) until graduation. After completing course work, a graduate student is to enroll for two semesters of Dissertation I (at 15 credit hours each semester) followed by four semesters of Dissertation II at 15 credit hours each semester. Students requiring more than these six semesters of dissertation to graduate should thereafter enroll for one credit hour of Dissertation II per semester. Dissertation I fees are less than regular course fees; Dissertation II fees are considerably less. A student registering for Dissertation II must also select the section corresponding to his/her Dissertation Advisor.

It is possible to register for Dissertation I and course(s) in the same term with the approval of the student's advisor and the Graduate Program Coordinator.

2-6. Colloquium Requirement

Each Ph.D. candidate will present the findings of his or her dissertation research at a departmental colloquium or seminar. The presentation normally will occur before the dissertation defense. If the student registers for Colloquium (or Seminar) during the semester in which the presentation occurs, the student may receive a letter grade (A, B, C, etc.). Otherwise the grade will be an S (or U).

3. DOCTORAL CANDIDACY REQUIREMENTS

3-1. Candidacy Examination (admits from Fall 2011 onwards)

The purpose of the Candidacy Exam is to certify that a graduate student has sufficient command and understanding in core areas of the physics discipline so that, along with the other requirements, admission as a candidate for the PhD degree is warranted. The exam covers the 4 core sections of the physics discipline: *classical mechanics*, *electricity and magnetism*, *quantum mechanics* and *statistical mechanics*. The level is aimed to be typical of upper undergraduate and beginning graduate level treatments of these areas. The Candidacy exam is not associated with any specific course; it seeks only to test whether a student can reason qualitatively and quantitatively with important concepts in the 4 core sections. To prepare, graduate students are encouraged to obtain copies of previous exams from the Department website or from the Department office.

The Candidacy Exam is administered over 2 days (typically the Tuesday and the Thursday) during a week at the beginning of each Fall and Spring semester. For each of the 4 sections 2 hours are allowed. On each day a specified section is to be examined in the first 2 hours, after which students are required to hand in their work. There is then a 10 minute break during which students who are to sit for the next section take their place. The next scheduled section takes place for 2 hours, after which students hand in their work for that section. For the subsequent day, the same arrangements will be implemented. For each semester offering of the Candidacy Exam, a detailed schedule of start and end times of each of the 4 sections shall be announced and distributed by the Department's Candidacy Exam Committee.

Students are strongly encouraged (but not required) to take any or all of the 4 sections at the beginning of their first semester in the Graduate Program. The results of this first semester attempt will be used by the student's academic advisor and the Graduate Program Coordinator to determine and adjust an appropriate course schedule for the student.

At each offering of the Candidacy Exam after their first semester, students must sit for the exam sections they have not previously passed until passes in all 4 sections are accumulated through a maximum of 4 attempts. That is, a student is allowed a maximum of 4 opportunities to build a pass for the Candidacy Exam: 2 fall semesters and 2 spring semesters (including their first academic year semester). Exceptions must be requested jointly by the student and the academic advisor, and approved by the Graduate Program Committee before the end of the student's first year in the program.

A pass in any of the 4 sections at any opportunity (including during their optional first semester), will be recorded in the student's file, and releases the student from the need to sit for that section subsequently. Accumulation of passes in all 4 sections of the Candidacy Exam is normally required for admission to PhD Candidacy.

A pass in any section of the Candidacy Exam does not automatically qualify the student for any waiver of any subsequent course requirement in the graduate program, but can be taken into consideration in any subsequent request.

Before any student is denied admission to PhD Candidacy status because of performance on the Candidacy Exam, the Graduate Faculty shall, under extraordinary circumstances, have the option of considering a variety of other graduate program performance data (eg, grades in graduate courses, achievements or potential in research, publications, etc), to determine whether there is over-riding evidence that PhD Candidacy should nevertheless be granted.

Topics covered by the Candidacy Exam are outlined below. Representative textbooks are indicated, as are representative KSU graduate and undergraduate courses.

CANDIDACY EXAM: FIRST DAY

□ **Classical Mechanics:**

6/75101 Classical Mechanics

Newtonian mechanics and application; Calculus of variations; Hamilton's principle and generalized coordinates (Lagrangian and Hamiltonian dynamics applied to central force problems, small oscillations, systems of particles and coupled oscillations, motion in a non-inertial frame, motion of rigid bodies, and problems involving constraints); canonical transformations; concepts and simple application of Hamilton-Jacobi theory; familiarity with Lagrangians and Hamiltonians for relativistic motion; relativity

Text: *Classical Dynamics* by Herbert Goldstein

□ **Electricity and Magnetism:**

6/75203 Classical Electromagnetism I

6/75204 Classical Electromagnetism II

Static electric and magnetic field and potential in free space (Coulomb's law, Gauss' law, Poisson and Laplace equations, method of images, Biot-Savart law, Ampère's law, multipoles); electric and magnetic field in matter (dielectrics, polarization, magnetization, susceptibility, permeability); electrodynamics and Maxwell's equations (Faraday's law, Maxwell's equations, gauge transformations, continuity equation, Poynting vector, Lorentz force); electromagnetic waves and radiation (wave equation, energy and momentum, dispersion, wave guides); relativistic electrodynamics (magnetism as a relativistic phenomenon, Lorentz transformation of electromagnetic field)

Text: *Introduction To Electrodynamics* by D.J. Griffiths

CANDIDACY EXAM: SECOND DAY

Statistical Mechanics:

6/75301 Statistical Mechanics

Random walks and distribution functions; thermodynamics: open and closed systems; free energy; Legendre transformations; quantum mechanical ensembles: microcanonical, canonical, and grand canonical; Bose-Einstein and Fermi gases; phonons and photons; chemical potential; classical statistical physics: interacting particles, equipartition theorem. condensed systems: phase transitions; Van der Waals, Landau mean field theory, critical exponents, fluctuations

Texts: *Thermal Physics* by Ralph Baierlein,
Statistical Mechanics by Kerson Huang

Quantum Mechanics:

6/76161 Quantum Mechanics I

6/76162 Quantum Mechanics II

Fundamental quantum concepts (e.g., wave functions, operators, Hilbert space); Superposition principle, uncertainty principle; Dirac notation and matrix formulation; Simple one-dimensional problems, including Delta-function Potentials; harmonic oscillator; time-dependent Schrödinger equation and applications; spin and orbital angular momenta; Bohr model of the atom, atomic spectra; hydrogen and other simple atoms; approximation methods such as elementary applications of perturbation theory and variational methods

Text: *Introduction to Quantum Mechanics*
by David J. Griffiths

3-2. Policy on Course work outside the Physics Department

The Department of Physics recognizes that at times, a more complete graduate preparation can be achieved if students are able to complement their physics graduate studies with courses offered by other Departments. To provide a consistent framework for students and advisors, the Physics Department has adopted the following guidelines. (Note: English courses taken to satisfy University requirements are regulated separately and do not fall under this policy):

- a) First Outside Course: The Department of Physics will automatically cover the cost incurred with the registration for 1 (one) course outside the Physics Department.
- b) Second (or more) Outside Courses: A graduate student, with the approval of his/her research advisor, may petition the Graduate Program Committee to register for additional course(s) outside the Department. When such a request is judged to be appropriate, the approval will be granted and, to the extent possible, supported by the departmental budget. If the tuition cost is covered by non-departmental funds, approval will be automatic assuming taking such a course will not jeopardize taking the scheduled physics courses.

First year students are strongly discouraged from taking outside coursework. Students who are especially well-prepared or who have been exempted from some course(s) in the first year curriculum by the Graduate Program Committee and who are interested in outside course work should consult their curriculum advisor.

1) *Second year students who have passed the Candidacy exam .*

The second year of study normally provides some degree of flexibility in course selection. However, students are required to obtain approval from their curriculum or research advisor each semester before they register. If a student is making satisfactory progress towards the Ph. D. degree, i.e., has passed the candidacy exam and has maintained acceptable grades in physics courses, then, the student and advisor may choose to include course work outside the Department of Physics in addition to the required Physics courses.

2) *Students registered for Dissertation I or II.*

A graduate student registered for Dissertation I or II and is interested in taking a course outside the Department should consult and seek approval from his/her research advisor, before submitting a written petition to the Graduate Program Committee. The approval may be granted regardless of outside coursework that may have been taken prior to reaching Dissertation I or II status.

4. ADVISORS FOR PHYSICS GRADUATE STUDENTS

4-1. Curriculum Advisor

The Graduate Coordinator will appoint a Curriculum Advisor for each new graduate student. The Curriculum Advisor will advise and counsel the student on his/her work and degree program. A new student may register for research credit hours with any faculty member, with the agreement of the faculty member, and subject to approval by the Curriculum Advisor and the Graduate Coordinator.

4-2. Thesis and Dissertation Advisor

An entering M.S. student must choose a thesis advisor no later than the end of the second semester. A doctoral student must have an approved dissertation advisor no later than the end of the semester in which s/he passes the Candidacy Exam. Students who pass the diagnostic Candidacy Exam have one year for selecting a dissertation advisor. Normally, Physics graduate students are expected to perform their Ph.D. research with a regular Physics faculty member. Under exceptional circumstance, the full Physics Graduate Faculty will consider a request to work with a non-Physics faculty member. However, a Physics Graduate Faculty co-advisor is normally required. Students changing from doctoral to masters' program have one semester after the change to choose a thesis advisor.

The student is expected to become aware of all the major areas of research in the Department before selecting a dissertation topic. The student may be aided in the choice of a research area and advisor by the following:

1. Attendance at Physics seminars or other programs where Physics Department faculty and graduate students speak.
2. Talking personally with faculty members about their present and planned research.
3. Reading professional literature such as *Physics Today*, *Physical Review*, *Science*, *American Journal of Physics*, etc..
4. Talking with senior graduate students about their research activities.

Before a Ph.D. student selects a research advisor it is highly recommended that the student consults with as many physics professors as possible regarding their research areas and interests.

The *Request for Research Advisors* should be completed and returned to the Graduate Coordinator. Copies of this form and directions for its completion appear on the following pages.

4-2.1. Termination by Advisor/Student or Student /Advisor

When either the student or the faculty advisor for the thesis or dissertation research feels that s/he can no longer continue in the advisor/advisee relationship, s/he should consult with the department

chairperson and/or the graduate coordinator. Beyond the first semester, which is considered a trial period, the investment of effort and resources by both parties indicates that termination is a step that should not be taken lightly. Future issues affected by a termination should be weighted. They include: the student's standing in the degree program, the question of stipend for the student, the disposition of research notes, files and data, possible authorship on publications reporting research in which the student had a significant involvement. If after consultation with the chairperson and/or graduate coordinator the student or advisor still feels the relationship must be terminated, it is their right to do so.

4-3. Limit on Number of Graduate Students per Thesis or Dissertation Advisor

The limit on the number of graduate students per thesis or dissertation advisor shall normally be three full-time, on-campus students. In exceptional cases, a faculty member may request permission from the Graduate Program Committee to have four students. Exceptions could include such situations as: (1) a faculty member brings a student to Kent State to work on a project; or (2) a faculty member needs an additional student to meet the requirements of research grants or contracts, or (3) to move into a new research area.

In certain cases, a student may have co-advisors. No more than two co-advisors are allowed per graduate student.

4-4. Approval Required for Submission of a Paper

If a graduate student wishes to submit an abstract or paper on scientific work, either for publication or presentation at a meeting, the submission must acknowledge Kent State University. Before the submission is made, approval of a Physics faculty member must be obtained (normally the advisor). The possibility of co-authorship must be considered and each co-author must approve the submission.

REQUEST FOR PH.D. RESEARCH ADVISOR (See directions on the reverse side)

Student's Name _____

Date entered Kent's
Graduate Program _____

A. Selected Research Advisor

Professor's Signature:

(signed) (date)

(NAME: Please print.)

Likely research problem:

Student Signature

Do you have support for this student?

YES NO

Do you expect to have support for this student?

YES NO

Grant #	OR: Proposal Submission
---------	-------------------------

student starting date	date decision expected
-----------------------	------------------------

Name(s) of current students:
How are they supported?

1. _____ GA/RA
2. _____ GA/RA
3. _____ GA/RA

(date)

B. Departmental Action

Approved Rejected by GPAC.

Graduate Coordinator (date)

Chairperson, Physics Department (date)

-- DIRECTIONS --
FORM FOR SELECTION OF RESEARCH ADVISOR

Doctoral students must have an approved dissertation advisor not later than the end of the semester of passing the Candidacy Exam. Students who pass the diagnostic Candidacy Exam have one year for selecting a dissertation advisor.

In general, the student is expected to consult as many Physics Graduate Faculty members as possible concerning their research programs, and his/her research interests. The selected faculty member signifies that s/he is willing and able to supervise the student's doctoral research under departmental guidelines by filling out part A of the form. The student then submits the form to the Graduate Coordinator for the Graduate Program Committee's approval.

Normally, the Graduate Program Committee and the Department Chairperson will approve the student's choice of advisor. However, there may be constraints which dictate otherwise. In that case, the student will be given an opportunity to discuss matters with the Committee, in order to assist in the selection and approval of a suitable research advisor. The Committee will take into account the interests of the student and potential advisors, the programmatic needs of the department, and the sources of support for his/her research.

The first semester of work with an advisor should be considered to be a trial period by both parties.

5. THESIS AND DISSERTATION

5-1. Dissertation (Thesis) Topic, Prospectus, and Committee

Within 12 months after approval of the choice of research advisor, the Ph.D. student and advisor should ensure that the following events take place:

- 1) a dissertation prospectus and topic should be filed with the Graduate Program Committee using the appropriate form signed by his/her advisor and the Dissertation Committee members. Effectively, a typical fall-entering graduate student must have a dissertation prospectus on file by the end of the spring semester of the third year of graduate work. The dissertation prospectus must be approved by the Committee no later than the semester before dissertation defense, and
- 2) the student, in consultation with the Research Advisor must select two (or three, if the Advisor is not a Physics Faculty) additional Physics Faculty to serve on the Dissertation Committee and an Outside Discipline Member from another department. The Dissertation Committee will also include a Graduate College Representative, selected by the Associate Dean for Graduate Programs prior to the final defense and upon request by the Research Advisor.

The forms *Notification of Approved Thesis Topic* and *Notification of Approved Dissertation Topic and Prospectus* and two examples of *Dissertation Prospecti* are shown in the following pages.

KENT STATE UNIVERSITY

NOTIFICATION OF APPROVED THESIS TOPIC

The graduate student will file this form with the College or Independent School office no later than the semester preceding that in which the candidate expects to receive a master's degree. Please present the information in typewritten form. If any of the information on this form changes, a new form must be filed.

Name _____ Date _____

Local Address _____

Telephone No. _____ Student No. _____

Degree Program (e.g., M.A., M.S., MFA) _____

Department or School and area of concentration _____

Proposed title of Thesis: _____

Are human subjects involved in this research? If yes, date of approval by the Kent State University

Institutional Review Board _____

Members of the thesis committee:

<i>Name (typed or printed)</i>	<i>Department</i>	<i>Signature</i>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

APPROVED: _____

Advisor

Date

Graduate Coordinator

Date

Chair/Director

Date

College Dean

Date

Please attach a paragraph including a clear statement of the problem to be undertaken and the procedure or methodology to be used in the research.

White (original): Registrar
Yellow: College

Gold: Student
Pink: Department/School

2/05

(Example 1)

Dissertation Prospectus

May 5, 1997

Precision Measurement of the g_1 Neutron Spin
Structure Function

Student: M.N. Olson
Advisor: G.G. Petratos

Research Motivation:

In the past decade, nucleon spin structure has become a topic of significant interest in the nuclear and particle physics communities. The discovery in 1998 by the European Muon Collaboration (EMC) that valence quarks carry only a small fraction of the nucleon's spin set off a flurry of theoretical and experimental activity aimed toward a better understanding of the spin structure of both the proton and the neutron. Central to this understanding are the spin structure functions. In addition to providing information on the valence quark contribution to the spin of the nucleon, these structure functions allow testing of fundamental quark-parton model (QPM) and quantum-chromodynamic (QCD) sum rules. A precision measurement of the longitudinal neutron spin structure function, g_1^n , is therefore an essential ingredient in the effort to understand nucleon spin structure.

Technical Approach:

The E-154 Collaboration has performed a precision measurement of the longitudinal spin structure function of the neutron utilizing deep inelastic scattering (DIS) of longitudinally polarized electrons from polarized ^3He gas at the Stanford Linear Accelerator Center (SLAC). Approximately 100 million DIS events were collected using a 48.3 GeV electron beam with average beam and target polarizations of $\sim 82\%$ and $\sim 38\%$, respectively. The kinematic range of the measurement was $0.014 \leq \chi \leq 0.7$ and $1 (\text{GeV}/c)^2 \leq Q^2 \leq 17 (\text{GeV}/c)^2$, where χ is the Bjorken scaling variable and Q^2 is the four-momentum transfer squared of the virtual photon exchanged in the scattering reaction. Scattered electrons were detected in two independent, large-acceptance magnetic spectrometers centered at 2.75° and 5.50° about the incident beam axis. Each spectrometer contained a detector package consisting of two threshold Čerenkov counters for electron identification and background rejection, two packages of scintillator hodoscopes for particle tracking, and a lead-glass shower calorimeter for energy measurement and further particle identification.

Anticipated Results:

We anticipate a precision measurement of g_1^n . Such a measurement depends on the ability to determine very small scattering-rate asymmetries between different electron/target spin configurations. These measured asymmetries must be corrected for beam and target polarizations, dilutions, backgrounds, and rate and radiative effects. The extraction of g_1^n from the corrected asymmetries requires knowledge of the unpolarized structure functions F_1 and F_2 , the proton spin structure function g_1^p , and the neutron and proton polarizations with a polarized ^3He nucleus. This large number of additional parameters necessitates a careful study of the treatment of the statistical and systematic errors. Spectrometer performance will be evaluated through resolution and efficiency studies, as well as through the comparison of total cross-section measurements to theoretical predictions.

(Example 2)

Dissertation Prospectus

Student: Hristina Galabova

Advisor: David Allender

A Theoretical Study of Surface Induced Phenomena in Nematic Liquid Crystals

Bulk elastic properties of nematic liquid crystals are usually described in terms of Frank elastic theory, and the surface influence is characterized by the stability of the nematic director orientation at the surface with respect to the surface easy direction when a bulk deformation is imposed. In the framework of Frank theory the nematic director orientation is considered to vary in space but the degree of uniaxial orientational order S is assumed to be spatially independent. Near surfaces, however, the orientational order is expected to be different from that of the bulk, and thus spatial variations of S should also be considered. In addition, a bulk uniaxial nematic liquid crystal in contact with a surface favoring homogeneous alignment should exhibit surface biaxiality. Therefore, a spatially dependent biaxial order parameter should be introduced in order to properly describe the surface behavior of the liquid crystal. In order to account for variations in both the uniaxial and the biaxial order parameters, as well as variations in the director orientation, in this dissertation the nematic liquid crystal will be described with a biaxial tensor order parameter and Landau-de Gennes theory will be used to study different surface induced phenomena in nematic liquid crystals.

The behavior of a nematic liquid crystal under severe confinement could differ considerably from the one predicted using Frank elastic theory. Changes in the uniaxial and biaxial order parameters would be as important as changes in the director orientation. As an example of a confined liquid crystal, a nematic liquid

Dissertation Prospectus (Example 2 – page 2)

crystal cell with homogeneous anchoring at one plate and homeotropic at the other, will be investigated under weak anchoring conditions. A number of different configurations are expected to arise in addition to the usual bend configuration. The possibility for different configurations will be discussed for different values of the surface anchoring strengths and different values of the cell thickness.

In the last several years a new method for liquid crystal alignment has been of great interest. It was found that certain types of photoreactive polymers have the ability to orient a liquid crystal after being exposed to linearly polarized ultraviolet (UV) light. A number of experiments have been performed but no definitive theory has been developed to describe the phenomenon. Therefore, in this dissertation the theoretical aspects of liquid crystal alignment on UV irradiated polymer films will be considered. Two different types of surface alignment will be studied. In the first case the photoreactive polymer is of poly (vinyl-cinnamate) (PVCN) type, and is exposed once to normally propagating linearly polarized UV light. Since this type of polymer film is experimentally found to introduce no pretilt angle, a two dimensional model of the film will be developed. The polymer film will be described as a collection of reactivity sites and their distribution function will be calculated as a function of exposure time. The bulk behavior of the liquid crystal, together with the polar and azimuthal anchoring coefficients, will be calculated using the Landau-de Gennes theory. Comparison with experimental observations will also be discussed.

In the second type of liquid crystal alignment on a UV exposed surface, a polyimide film is irradiated in such a way that a liquid crystal in contact with the film exhibits tilted alignment. The polyimide film is first exposed to normally propagating linearly polarized UV light, and the film is subsequently irradiated with obliquely incident UV light with polarization rotated in a plane perpendicular to the polarization direction of the first UV light. In this dissertation the distribution of ordering sites in the polyimide film will be investigated, and the behavior of a nematic liquid crystal in contact with an exposed film will be calculated in the framework of Landau-de Gennes theory. The generated pretilt angle will be studied as a function of both normal and oblique exposure times, and as a function of the UV light angle of incidence. The surface anchoring strengths will also be estimated and comparison with experimental observations will be discussed.

5-2. Writing Style for Thesis and Dissertation

The Kent State College of Arts and Sciences has established general guidelines for the format and style of theses and dissertations, described in a document titled *Style Guide and Instructions for Theses and Dissertations*. Copies may be obtained from the Physics Department office or directly from the office of the College of Arts and Sciences. These guidelines have considerable latitude for variations in the style of writing and of presentation of research results among the many disciplines within the College. A pdf version of the *Style Guide and Instructions for Typing Thesis and Dissertations* can be downloaded from the Graduate Colleges website “<http://as.kent.edu/files/style%20guide.pdf>”. In the matter of stylistic details not addressed in the guidelines from the College of Arts and Sciences, a thesis or dissertation should follow the *AIP Style Manual*, published by Springer-Verlag New York, Inc. For more information and availability, please call (516) 576-2440 or check their website:

<http://www.aip.org/pubservs/style/4thed/toc.html>

Kent State University is participating in the Electronic Thesis and Dissertation Initiative. You are encouraged to electronically publish your dissertation to give your work a broad exposure. Visit <http://www.library.kent.edu/etd> for more information.

The student, the student's advisor, and the department Chairperson must certify that the completed dissertation has been prepared in conformity with the guidelines at the time the dissertation is submitted to the Graduate College.

5-3. Procedures for Examination of the Masters Thesis and Oral Defense

The student and his/her advisor select a thesis examination and defense committee. The advisor, in consultations with the committee members, sets the date of defense. He/she serves as the chair of the examination committee and as the moderator during the defense. The defense schedule and a short abstract of the thesis will be announced in the department for interested parties to attend.

5-4. Procedures for Examination of the Doctoral Dissertation and for the Oral Defense

5-4.1. General

Two separate committees will be involved with the progress, completion, and examination of the doctoral candidate's dissertation. These are (1) the dissertation committee, and (2) the examining committee. The examining committee includes the dissertation committee plus two additional members, the Graduate College representative and the Moderator.

5-4.2. Dissertation Committee

The candidate's dissertation committee will be approved by the department Chairperson upon recommendation from the Graduate Program Committee. The membership of the dissertation committee consists of at least three *tenured or tenure-track* members of the Graduate Faculty from the *Department of Physics* (including the advisor and co-advisors) and a Graduate Faculty member from an outside discipline relevant to the dissertation topic. Together with the advisor, this group will be responsible for

monitoring the progress of the dissertation, and will direct the candidate's research. The student's research advisor will bear the heaviest responsibility, and will serve as chairperson of the dissertation committee.

5-4.3. Preliminary Approval of Dissertation

When the advisor thinks that the dissertation is ready, it will be circulated in easily legible form among the members of the dissertation committee. The advisor will allow a ten-day period for reading the dissertation and will then convene the dissertation committee (without the candidate) for the purpose of evaluating it. The Graduate Faculty Representative should be notified of this meeting and invited to attend (*see Section 5-4.3* below.) The committee will make a formal decision regarding the “defensibility” of the dissertation in the meeting. Recommended revisions will be noted by the advisor and communicated to the candidate. When, in the opinion of the advisor and the candidate the appropriate revisions have been made, the advisor will inform the department Chairperson and the Associate Dean for Graduate Affairs and schedule the final oral examination.

5-5. Examining Committee

5-5.1. Personnel

The examining committee consists of the dissertation committee (as defined above), plus a moderator and a representative from the Graduate Faculty. (Note: The examining committee for a masters thesis defense does not require a moderator, graduate college representative or an outside person.)

5-5.2. Selection of the Moderator

The moderator will be selected by the dissertation advisor from the members of the Graduate Faculty approved for this service by the Associate Dean for Graduate Affairs, College of Arts and Sciences. The moderator will not be a faculty member in the department of the candidate's major.

5-5.3. Graduate Faculty Representative

The representative of the Graduate Faculty will be selected by the Associate Dean for Graduate Affairs or his designate from those who have directed a dissertation to completion. At the time that the entire dissertation is first circulated to the Dissertation Committee, the student's research advisor must request the Associate Dean for Graduate Affairs to appoint the Graduate Faculty Representative. The Graduate Faculty Representative is provided with a copy of the dissertation and invited to the meeting to discuss Preliminary Approval of Dissertation (*see 5.33* above). S/he reports back to the Associate Dean on the quality of dissertation and defense, and the compliance with the KSU procedures.

5-6. The Final Oral Defense

5-6.1. Time and Place

The advisor will designate the time and place of the final oral defense and notify all members of the examining committee. The defense should be scheduled to allow ten days for the Examining

Committee to study the dissertation. This ten-day period is in addition to the ten-day period (noted in *Section 5-3.3*) in the process for obtaining preliminary approval of the dissertation committee. (The candidate should make further revisions after the oral defense, if necessary.) See *Section 6-3* for a *timeline* showing the steps required to complete a dissertation.

Copies of the abstract of the dissertation will be distributed to departmental faculty and graduate students and posted at least two days prior to the defense to familiarize members of the Graduate Faculty and other students with the findings and the method of the dissertation.

5-6.2. Attendance

The final oral will be open to the University community. Questions will be asked by members of the Examining Committee; however, questions may be asked by anyone present at the discretion of the Moderator near the end of the defense after the Examining Committee is done.

5-6.3. Comments or Questions

Questions or comments dealing with punctuation or grammar minutiae, spelling, etc., in the dissertation should be written and submitted privately to the student's research advisor and should not be part of the questioning during the defense. General comments or questions dealing significantly with the quality of writing are quite appropriate.

5-6.4. Order of the Defense

The candidate will open the defense with a brief (approx 20 minute) presentation after which the members of the Examining Committee will question the candidate in an order to be determined by the Moderator. When, in the opinion of the Moderator, members of the examining committee have had an adequate opportunity to question the candidate, the Moderator may open the examination to appropriate questions from others present.

5-6.5. Determination of Success or Failure of Defense

When the questioning has run its course, the Moderator will adjourn the defense and clear the room of everyone except the members of the Examining Committee. Parliamentary procedure will be observed to determine the success or failure of the candidate with the Moderator acting as chairperson without a vote.

- a. The candidate should be evaluated both upon the quality and significance of the dissertation and upon the oral defense of the findings.
- b. The candidate passes if there is no more than one dissenting vote cast by the Examining Committee.
- c. All members of the Examining Committee will sign the Report of Final Examination form, recording their votes.

5-6.6. Binding of Dissertation or Thesis

In addition to the bound copies required by the University, it is departmental policy that a final version of the dissertation or thesis be furnished to the Advisor.

6. TIMETABLE FOR GRADUATE DEGREE PROGRAMS

6-1. Master's Degrees

The non-thesis option of the M.A. degree program based on coursework can be completed in one calendar year, as shown in the course schedules in *Section 2*. The M.S. degree requires the thesis and may require an additional year for completion. Based on satisfactory performance, financial support for M.S. students is typically given for four semesters, whereas those in the non-thesis, M.A. option, receive two semesters of support. M.S. students who do a thesis should normally select a research advisor and begin research work no later than the end of the second term of graduate work at Kent State University.

6-2. Doctorate

The timetable for the completion of doctoral research is difficult (for even the most experienced advisor) to predict since unknown experimental or theoretical difficulties may arise. The schedules given in *Section 2* show that course work can usually be completed by full-time students who enter with a bachelor's degree in two academic years plus one summer. It is normally expected that a student entering with a bachelor's degree will take the candidacy exam after spending one academic year or possibly one semester and one summer term in the graduate program at Kent State. After completing the candidacy exam and the course work, the dissertation research is the primary responsibility of the student. Full-time students should make every effort to complete the dissertation within five years of graduate study. Continued financial support for the Ph.D. student is based on certain criteria which are given in the following section. These criteria are based on satisfactory progress toward the degree. See also the section on *Time Limits* in the *Graduate Catalog*.

6-3. Timeline for Dissertation

The timeline shows the sequence of major events involved in the completion and defense of a dissertation. Section numbers refer to sections in this document which provide details of various steps.

Timeline to Completion of Dissertation Requirements

- ⌚ Select Dissertation Advisor (*Section 4-2*) before the end of the semester in which the Candidacy Exam (*3-1, 3-2*) is passed. (Two semesters for students who passed Candidacy Exam in first year)
- ⌚ Form Dissertation Committee (*5-3, especially 5-3.2*) within one year of selecting dissertation advisor
- ⌚ Present Research Topic and Prospectus proposal to Graduate Program Committee (*section 5-1*) within one year of selecting dissertation advisor and at least one semester before graduation
- ⌚ *Notification of Approved Dissertation Topic and Prospectus (5-1, 5-3.2)* filed
- ⌚ Conduct research
- ⌚ Applies for graduation (watch for deadlines!)
- ⌚ Present Departmental Colloquium or Seminar (*2-4.1, 2-7*) at one month before graduation.
- ⌚ *Preliminary* draft of dissertation goes to Dissertation Committee (*5-3.3*)
Advisor requests Graduate Faculty Rep. from Associate Dean for Graduate Affairs (*5-4.3*)
(10 days allowed for Examining Committee to read dissertation) (*5-3.3*)
- ⌚ Dissertation Committee holds pre-defense meeting to give preliminary approval of dissertation (*5-3.3*); Grad. Fac. Rep. is invited (*5-3.3*); Dissertation Advisor selects Moderator (if not done before) (*5-4.2*)
- ⌚ Comments and suggestions by Dissertation Committee received in pre-defense meeting forwarded by Advisor to candidate (*5-3.3*)
- ⌚ *Revised* draft goes to Examining Committee (*5-4, 5-5.1*)
(10 days allowed for Examining Committee to read dissertation) (*5-5.1*)
- ⌚ Dissertation Examination & Defense (*5-5.1 to 5-5.5*)
- ⌚ Report of examination results filed through Department office (*5-5.5.c*)
- ⌚ Submission of final version of Dissertation to the Graduate College.
- ⌚ Graduation

7. FINANCIAL SUPPORT

Financial appointments for graduate study consist of graduate assistantships (GA), teaching fellowships (TF), research assistantships (RA), and non-service fellowships and traineeships (e.g., University and other fellowships). Doctoral and master's degree students usually receive full or half-time GA stipends.*** Students who are not RA's may be appointed as ½ time GA's for the three months of summer. Each appointee also receives a tuition scholarship which covers all fees. The University waives the out-of-state tuition fee for all appointees. A student should seek half-time RA support for the summer months by approaching faculty members before the end of the spring semester. Normally, full-time RA's are not offered to students until after the selection of dissertation advisor and completion of course work which typically occurs at the end of the second academic year. The policy of the Physics Department is to Require the student to be making satisfactory progress toward their degree in order to be eligible for financial support from University sources. The recommended time limit on appointments is five academic years for students who enter the program without a Master's degree and four academic years for students who enter the program with a Master's degree.

All appointments of Physics graduate students, independent of the sources of funds, and other activities involving the receipt or usage of monies from University sources and must be processed through and approved in advance by the Graduate Coordinator and the Department Chairperson.

Students in the doctoral programs and those in the master's programs seeking to enter the Ph.D. programs will be reviewed at the end of each semester (after grades have been turned in) for financial support for the following term. If the following criteria, as established by the Graduate Program Committee, are fulfilled, the student will be assured of continuous Departmental financial support.

7-1. Second-Year Support

To be eligible for support, a student must (in order of importance),

- Perform satisfactorily in teaching and other departmental duties. Performance evaluations by the supervising faculty member and students will be used to measure your performance.
- Complete at least 20 semester hours of graduate course work in the first year at Kent State University in accordance with a departmentally-approved course schedule filed in the department office. (Students may be eligible for consideration as a Teaching Fellow after satisfactory completion of 32 semester hours or receipt of a master's degree from a recognized institution in the United States).
- Maintain a *departmental* GPA of 3.2 or higher in graduate course work at Kent State University

*** First year students receive \$500 of the stipend upon completion of the Teaching Assistant Orientation Program, scheduled during the week prior to fall classes.

- Complete English proficiency requirements by taking recommended courses in the first year.
- Select a dissertation advisor by the end of the term during which the candidacy exam is passed.

7-2. Third-Year Support (in addition to requirements under Section 7.1)

- Complete the courses listed on the student's approved schedule with a physics GPA of 3.2 or higher.
- Pass the doctoral candidacy examinations in the second year.
- Have approved dissertation advisor.

7-3. Fourth-Year Support

- Maintain the approved schedule of course/dissertation registrations and a physics GPA \geq 3.2.
- Have a recommendation from the Research Advisor that you are making satisfactory progress.

7-4. Fifth-Year Support

- Normally 5th year appointment is made on a case by case basis..
- Continue registration in Dissertation II in units of 15 hours per term (fall, spring, summer).
- Make satisfactory progress towards dissertation; have a positive recommendation from the research advisor.

7-5. Sixth-Year Support

Sixth-year support is discouraged. If needed for valid and sufficient reasons, support will be considered on a term-by-term basis.

7-6. Termination of Support

If a student is terminated from a degree program, for example as a result of failing the Ph.D. candidacy examinations, then financial support is discontinued effective no later than the end of the semester terminated.

Any resignation of a graduate teaching assistantship or teaching fellowship must be submitted in writing by the student to the Graduate Coordinator or the Department Chairperson for transmission to the Associate Dean for Graduate Affairs.

Any resignation of a research assistantship must be in writing by that appointee. The resignation is to be addressed to the dissertation/research advisor with a copy to the Department Chairperson. The Department Chairperson will not normally accept such a resignation without consultation with the dissertation research advisor. The department Chairperson may seek the advice of appropriate departmental committees and consider the conditions for termination as noted in *Section 4-2.1*.

8. DUTIES AND EVALUATION OF GRADUATE APPOINTEES

Graduate Assistants and Teaching Fellows who are involved in the teaching of undergraduate students in laboratories, recitations, or classroom lectures have an important task in the education of undergraduate students.

Appointees lecturing in Rooms 108, 110, and 111 should obtain a key from the departmental office for those rooms and for the demonstration equipment room (109).

8-1. Graduate Assistant

A graduate student holding a full-time Graduate Assistant appointment is expected to devote 20 clock-hours of work per week to his/her teaching duties. This work can take on various aspects, such as: responsibility for elementary laboratory sections; setting up equipment for the intermediate laboratories; grading laboratory reports; assisting faculty members in grading; supervising and grading intermediate laboratory sections; teaching recitation sections; assisting faculty members in conducting their research; and grading of upper division and graduate courses. The duties will generally vary from term to term. Usually the first year Graduate Assistant will be assigned elementary laboratory sections; in the second and succeeding years, s/he may be assigned an intermediate laboratory or recitation sections. The main purposes of these assignments are to expose the Graduate Assistant to as many and varied teaching experiences as possible so that the assistantship will be a valuable learning experience should s/he decide to enter the teaching profession, and to assist in carrying the teaching load of the Department as efficiently as possible.

It is the duty of the Graduate Assistant to be fully informed of his obligations, time commitments, mode of instruction, expectation by students and the faculty member to whom s/he is assigned. The Graduate Coordinator, the Assistant to the Chair, and others should be consulted when in doubt. Any absence of an instructor from a class or lab must be approved by the Assistant to the Chairperson (or, if s/he cannot be contacted, by the Chairperson) before the absence. Each instructor has the responsibility for seeing that all classes are covered in the event of an excused absence. Graduate assistants do not have authority to cancel a class, shorten the class period, or change course content or the format to be used.

8-2. Teaching Fellow

A Teaching Fellow usually has primary responsibility for the teaching of introductory courses or recitations in physics, lectures in physical science, upperclass laboratories, or equivalent responsibility. A half-time Teaching Fellow is required to teach three (3) or four (4) semester credit hours which amounts to one lecture course preparation or equivalent. The various duties are assigned by the Chairperson (or designate) and will generally vary from term to term.

8-3. Research Assistant

The student holding a Graduate Research Assistant appointment will usually be expected by the grant-awarding agency (NSF, DOE, etc.) to contribute a minimum of 20 clock-hours of work per week to the research project. The student's advisor will expect the student to contribute considerably more hours than this depending on the student's course load for the term.

8-4. Teaching Evaluation of Graduate Appointees

The performance of Graduate Assistants or Teaching Fellows in their teaching duties is evaluated at the end of each term through evaluation forms filled in by the students in the class. The summary of evaluations is returned to the instructor. The faculty member(s) to whom a GA/TF is assigned evaluates and submits his/her evaluation of the performance and effectiveness of the GA/TF to the Graduate Program Committee.

8-5. Role and Status of Graduate Student Appointees

There is an important document issued by Kent State University entitled *Policy on Role and Status of Graduate Student Appointees*. It discusses the graduate student's role in University governance at the departmental, collegial, and University levels, types of service appointments, evaluation of performance, hospitalization, etc. New graduate students should become familiar with its contents and should receive individual copies. A copy of this document is also available in the departmental office.

9. STUDENT ORGANIZATIONS AND COMMITTEE SERVICE

9-1. Society of Physics Students and Sigma Pi Sigma

The Society of Physics Students (SPS) is a national organization whose chapter at Kent State includes both undergraduate and graduate students. SPS holds regular meetings and arranges departmental events (picnics and/or dinners). Sigma Pi Sigma ($\Sigma\Pi\Sigma$) is a national physics honor society which is associated with SPS. Membership in $\Sigma\Pi\Sigma$ is by election on the basis of physics scholarship. The honorary society includes undergraduate and graduate students and faculty.

9-2. Committee Service - Graduate Student Representatives

Graduate students serve on certain departmental committees. This service is valuable to the Physics Department in the operation and improvement of its graduate and undergraduate programs. It is also valuable to the participating student, since the opinions and influence of the physics graduate students whom (s)he represents can aid in the formation of policy or operation of the committees. Students are expected to let their interests and requests be made known through their representatives on departmental committees or through the president of SPS to the department Chairperson.

10. SEXUAL HARASSMENT

The policy and procedures governing sexual harassment are detailed in the *University Policy Register* under section 3342-6-013. Faculty members and students should follow these procedures when complaints are pursued.

The departmental policy regarding sexual harassment is intended to clarify the point at which protected free expression ends and prohibited discriminatory harassment begins. Speech or other expression constitutes harassment if it intentionally:

- (a) is directed to an individual or individuals based upon that person's race, color, religion, national origin, age, disability, identity as a veteran with a disability, a veteran of the Vietnam era, gender, sexual orientation, or any other basis; and
- (b) tends to incite an immediate breach of the peace by making use of insulting or *fighting* words, nonverbal symbols or threatens violence. In the context of discriminatory harassment, insulting or *fighting* words or nonverbal symbols are those which are commonly understood to convey direct or visceral hatred or contempt for human beings on the basis of their race, color, religion, national origin, age, disability, or identity as a disabled veteran, veteran of the Vietnam era, or gender and/or sexual orientation or on any other basis; or
- (c) is sufficiently severe, pervasive, or persistent so as to interfere with or limit the employment, education or residential opportunities at Kent State University.

A violation of this policy should be reported immediately so appropriate action may be taken according to university policy. Persons who believe that harassment has occurred are strongly encouraged to contact one of the following: office of affirmative action, personnel, departmental Chairperson, supervisor, student ombudsman, judicial affairs, residence services, staff, or an appropriate university employee to learn of the grievance/resolution process most appropriate to the specific situation.

When incidents of alleged harassment come to the attention of a university employee, the employee, or supervisor as appropriate, shall inform that person of his/her right to notify the office of affirmative action directly or initiate other procedures available in the rules of the *University Policy Register* and the Administrative Code which include:

- (a) The complaint procedure in rule 3342-6-021 of the *University Policy Register* with the office of affirmative action.
- (b) The student conduct procedure found in rule 3342-4-15 of the *University Policy Register*.
- (c) The student academic complaint procedure found in rule 3342-4-16 of the *University Policy Register*.
- (d) The student non-academic grievance procedure found in rule 3342-4-40 of the *University Policy Register*.
- (e) The persona non grata procedure found in rule 3342-6-15 of the *University Policy Register*.

- (f) The student employee grievance procedure found in rule 3342-6-15 of the *University Policy Register*.
- (g) The student conduct procedure (regional campuses) found in rule 3342-8-08 of the *University Policy Register*.
- (h) The student grievances in regional campuses found in rule 3342-8-06 of the *University Policy Register*.
- (i) The administrative policy and procedures regarding grievances of non-teaching unclassified and classified staff found in rule 3342-6-14 of the *University Policy Register*.

University employees who observe incidents of harassment, as defined above, should report the incident according to the guidelines expressed above and, where appropriate authority exists, may initiate disciplinary procedures.

If harassment is alleged, university procedures normally implemented can be suspended if the individual filing the complaint wishes to have the matter referred to the office of affirmative action for possible resolution by all involved parties. All such matters shall be referred back to the initial procedure, either with the office of affirmative action's resolution of the matter or, for further action under the original process.

11. STUDENT GRIEVANCE PROCEDURE

The policy and procedures governing student academic complaints are detailed in the *University Policy Register* under section 3342-4-16. Faculty members and students should follow these procedures when student complaints are pursued.

The departmental policy regarding student grievances of any nature is that they be resolved at the lowest possible level consistent with the departmental committee structure and departmental governance procedures. If the grievance is course related, the first request for redress or reconsideration should be made to the instructor immediately in charge of the part of the course in question. If such a conference fails to satisfactorily resolve the complaint, the student will then contact the permanent physics faculty member in charge of the course, if different from the initial contact.

If the matter is not informally resolved immediately, the student may discuss the matter with the department Chairperson before lodging a formal complaint in writing, to the Department Chairperson. The student may also consult with the student ombudsman in an attempt to achieve informal resolution.

A grievance directed toward another department should discuss the problem with the Assistant to the Chairperson or the Chairperson of the Department of Physics.