

LONG SIGNATURE SHEET



Proposal Number: PHYS 2-12-09

Proposal Title Change to the degree requirements for the M.S. in Optical Science and Engineering

RECEIVED
3/20/09

Originating Department Physics and Optical Science

TYPE OF PROPOSAL: UNDERGRADUATE _____ GRADUATE X UNDERGRADUATE & RADUATE _____
(Separate proposals sent to UCCC and Grad. Council)

DATE RECEIVED	DATE CONSIDERED	DATE FORWARDED	ACTION	SIGNATURES
			Approved	<u>DEPARTMENT CHAIR</u>
	3/20/09	3/20/09	Approved	<u>COLLEGE CURRICULUM COMMITTEE CHAIR</u>
	4/10/09	4/10/09	Approved	<u>COLLEGE FACULTY CHAIR</u>
4/10/09	4/14/09	4/15/09	Approved	<u>COLLEGE DEAN</u>
			Approved	<u>UNDERGRADUATE COURSE & CURRICULUM COMMITTEE CHAIR</u> (for undergraduate courses)
			Approved	<u>GRADUATE COUNCIL CHAIR</u> (for graduate courses)
			Approved	<u>FACULTY GOVERNANCE SECRETARY</u> (noting Faculty Council approval on Consent Calendar)
				<u>FACULTY EXECUTIVE COMMITTEE</u> (if decision is appealed)

Long Form Course and Curriculum Proposal

I. Heading and Proposal Number

A. University of North Carolina at Charlotte

Change in degree requirements

Change Proposal from the Department of Physics and Optical Science

B. Proposal Number PHYS 2-12-09

C. Change to the degree requirements for the M.S. in Optical Science and Engineering

II. Content of Proposal

A. 1. **Summary.** The Department of Physics and Optical Science proposes to change the degree requirements for the M.S. in Optical Science and Engineering to include a non-thesis option.

II. A. 2. **Proposed Catalog Copy**

M.S. IN OPTICAL SCIENCE AND ENGINEERING

Degree Requirements

The degree of Master of Science in Optical Science and Engineering with the thesis option is awarded for completion of scholarly research that advances the knowledge base in the field of that research. Evidence of this is demonstrated by a successful thesis defense. The degree of Master of Science in Optical Science and Engineering with the non-thesis option is awarded for completion of formal course work. Additionally, recipients of this degree should demonstrate mastery of relevant subject matter and a potential for success, usually in a position with government or industry.

The minimum requirement for the M.S. degree in Optical Science and Engineering is 32 credit hours beyond the baccalaureate degree. For the thesis option, the requirement includes a minimum of 9 credit hours of thesis research, 2 credit hours of seminar (OPTI 6110), and a minimum of 21 credit hours of formal course work. For the non-thesis option, the requirement includes 2 credit hours of seminar (OPTI 6110), and a minimum of 30 credit hours of formal course work. Both options must include at least 15 credit hours in approved courses having an OPTI prefix.

All graduates of the program must demonstrate competency in the Core Curriculum. Students may demonstrate competency in the subject matter of the Core Curriculum by earning a grade of Pass on each of the five sections of a comprehensive qualifying examination. Each section of the comprehensive examination is based on subject matter in one of the five courses comprising the Core Curriculum. Students who do not receive a grade of Pass on a given section of the comprehensive examination must enroll in the corresponding Core Curriculum course. Students demonstrate competency in the Core Curriculum by passing the comprehensive examination or by earning a grade of B or better in those core courses not passed during the comprehensive examination.

Well-prepared students may earn a grade of pass on one or more of the five sections of the comprehensive examination. In those cases, credit hours that would have been earned in the courses, upon which the sections passed were based, may be replaced by credit hours in other electives approved by the student's Advisory Committee and the Optics Program Director.

A student in the M.S. program must maintain a minimum GPA of 3.0 in all coursework attempted for the degree. An accumulation of two C grades will result in termination of the student's enrollment in the program. A grade of U earned in any course will result in termination of the student's enrollment in the program.

Qualifier and Admission to Candidacy

All graduates of the program must demonstrate competency in the Core Curriculum. Students in the thesis program must prepare a Plan of Study before the end of the second semester following admission to the program. The Plan of Study must be approved by the Advisory Committee.

Residency Requirement

The student must satisfy the residence requirement for the program by completing 12 credit hours of continuous enrollment in coursework/thesis credit. Residence is considered continuous if the student is enrolled in one or more courses in successive semesters until 12 credit hours are earned.

Time Limit for Completion of Program Requirements

All program requirements must be completed within 5 calendar years from the date the student is admitted into the program.

Transfer Credit Accepted

Up to 6 credit hours of approved coursework may be transferred from other accredited masters and doctoral programs. Only courses in which the student earned a grade of B or better (or its equivalent) can be transferred. No more than 6 credit hours of approved coursework taken as a post-baccalaureate student may be applied toward the degree. Credit for thesis research cannot be transferred.

Assistantships

Support for beginning graduate students is usually a teaching assistantship. Continuing students are often supported by research assistantships.

Language Requirement

The program has no language requirement.

Thesis option:

After successful completion of the Core Curriculum requirement and approval of the Plan of Study, the student will prepare a Research Plan for the thesis that is approved by the Advisory Committee. The Research Plan must demonstrate: (a) the student's knowledge of the relevant literature base, and (b) a research plan that, if successfully completed, will lead to an approved thesis. The student must present a

written plan to the Advisory Committee. The student must also make an oral defense of the Research Plan at a presentation before the Advisory Committee.

After successfully demonstrating competency in the Core Curriculum, preparation of an approved Plan of Study, and approval of the Research Plan by the Advisory Committee, the student is admitted to candidacy. The qualifier, as described, must be completed within two years following admission to the program. A full-time student is normally expected to complete the qualifier prior to the end of the third semester following admission to the program.

Thesis

Each student will complete a minimum of 9 credit hours of thesis research. The student must present a written thesis to the Advisory Committee. The student must defend the thesis at a presentation before the Optics Faculty. Upon approval of the written thesis and oral presentation by the Advisory Committee, the student has successfully completed the thesis requirement. The thesis must be written using a format acceptable to the Graduate School.

Thesis Advisor and Advisory Committee

Each student in the program must have a Thesis Advisor and an Advisory Committee before being admitted to candidacy. The student should select a thesis advisor before the end of the first year of residency. The student and the thesis advisor jointly determine the advisory committee. The Thesis Advisor serves as Chair of the Advisory Committee and must be a member of the Optics Faculty at UNC Charlotte. The advisory committee must have at least 3 members, the majority of which must be members of the Optics Faculty. Composition of the Advisory Committee must be approved by the Optics Program Director.

Comprehensive Examination

The thesis defense is the final examination.

Non-thesis option:

After successfully demonstrating competency in the Core Curriculum, the student is admitted to candidacy. All courses used to satisfy the degree requirements must be approved by the Optics Program Director.

B. Justification

A non-thesis option at the master's level is for students who wish to achieve a broad competency in the field of optics with the desire to be employed in industry or government. The non-thesis option, without a specific research project, is particularly attractive to students who live in the region and are already employed in positions related to optics.

C. Impact

We currently have very few master's level students in optics primarily because there is little internal funding for tuition and assistantships. Faculty prefer awarding scarce research assistantships to Ph.D. students because of the level of scholarly work that they can produce over a longer period of time. We expect to increase our student numbers, in optics at the master's level, threefold over the next 2 years

with this option available. Some potential students would take advantage of this option on a part-time basis.

D. Resources Required

1. There is no requirement for new faculty.
2. There is no requirement for new facilities.
3. There is no equipment requirement.
4. There is no requirement for any extraordinary computing resources.
5. There is no requirement for additional audio-visual resources.

E. Consultation with the Library

1. Library Consultation is attached.
2. Other departments were not consulted.

F. Initiation and consideration of this proposal

1. A committee of the Interdisciplinary Optics Faculty approved this proposal and it was unanimously supported by the Department faculty.

G. Attachments

1. Library Consultation

**J. MURREY ATKINS LIBRARY
LIBRARY CONSULTATION FOR
COURSE AND/OR CURRICULUM PROPOSAL**

Date: February 24, 2009

To: Dr. Robert Tyson
Physics and Optical Science Department

From: Barbara Tierney, Library Liaison to Physics and Optical Science Dept.

Re: M.S. in Optical Science and Engineering (non-thesis option)

The Dept. of Physics and Optical Science proposes to change the degree requirements for the M.S. in Optical Science and Engineering to include a non-thesis option.

The adequacy of library holdings to support the above proposal when it is implemented is evaluated by the Reference Librarian as follows:

1. Holdings are superior:
2. **Holdings are adequate:** **X Please see below comments**
3. Holdings are adequate
only if department
purchases additional materials:
4. Holdings are inadequate:

Comments:

I believe that the UNC Charlotte J. Murrey Atkins Library currently has adequate relevant library resources (indexes and databases, journals and serials, and monographic materials) to support both the non-thesis and thesis options for the M.S. in Optical Science and Engineering.

Specifically I find that:

The UNC Charlotte Atkins Library currently has adequate relevant print and electronic indexes and databases to support this proposed new program.

These relevant index and database resources include:

Compendex
Institute of Physics
Optics Index
Science Direct
Scitation
Springer-Verlag
SPIE Digital Library
Web of Science
Wiley Interscience

In addition, the UNC Charlotte Atkins Library currently provides adequate relevant journal and serial titles--many originating from the OSA (Optical Society of America), the SPIE (Society of Photo-Optical Instrumentation Engineers), the IEEE (Institute of Electrical & Electronics Engineers), and the IOP (Institute of Physics)--- as well as from other individual institutional subscriptions and publisher or aggregator databases (such as Science Direct, Springer-Verlag , Wiley Interscience or

Ebscohost)-- which support both the non-thesis and thesis options for the M.S. in Optical Science and Engineering.

To give reviewers an idea of how the UNC Charlotte Atkins Library journal and serial holdings compare to the “Journal Citation Report” listing of leading journals in the area of Optics, I prepared the following table to illustrate Atkins Library holdings.

Column One of the table shows the “Journal Citation Report” listing of the most frequently cited scholarly and technical journals and serials in the field of Optics.

(Note: “Journal Citation Reports” is a comprehensive resource for journal evaluation, using citation data drawn from over 8,400 scholarly and technical journals worldwide. Coverage is both multidisciplinary and international, and incorporates journals from over 3,000 publishers in 60 nations. The JCR is the only source of citation data on journals, and includes virtually all specialties in the areas of science and technology. The Science Edition of “JCR” contains data from roughly 5,000 journals in the areas of science and technology.)

LEADING OPTICS JOURNALS (LISTED BY: JOURNAL CITATION REPORTS)	Atkins Library
ADVANCED MATERIALS FOR OPTICS AND ELECTRONICS	YES
ADVANCES IN ATOMIC, MOLECULAR, AND OPTICAL PHYSICS	YES
APPLIED OPTICS	YES
APPLIED PHYSICS. B, LASERS AND OPTICS	YES
DISPLAYS	YES
FIBER AND INTEGRATED OPTICS	YES
IEE PROCEEDINGS-MICROWAVES ANTENNAS AND PROPAGATION	YES
IEEE P-OPTOELECTRON	NO
IEEE JOURNAL OF SELECTED TOPICS IN QUANTUM ELECTRONICS	YES
IEEE PHOTONICS TECHNOLOGY LETTERS	YES
IET Optoelectronics	YES
IMAGE AND VISION COMPUTING	NO
INFRARED PHYSICS AND TECHNOLOGY	YES
INTERNATIONAL JOURNAL OF IMAGING SYSTEMS AND TECHNOLOGY	NO
INTERNATIONAL JOURNAL OF INFRARED AND MILLIMETER WAVES	NO
INTERNATIONAL JOURNAL OF MICROGRAPHICS AND OPTICAL TECHNOLOGY	NO
INTERNATIONAL JOURNAL OF OPTOELECTRONICS	YES
JOURNAL OF BIOMEDICAL OPTICS	YES
JOURNAL OF ELECTRONIC IMAGING	YES
JOURNAL OF INFRARED AND MILLIMETER WAVES	NO
JOURNAL OF LASER APPLICATIONS	NO
JOURNAL OF LIGHTWAVE TECHNOLOGY	YES
JOURNAL OF LUMINESCENCE	YES
Journal of Micro-Nanolithography MEMS and MOEMS	YES
JOURNAL OF MICROLITHOGRAPHY MICROFABRICATION AND MICROSYSTEMS	YES

JOURNAL OF MODERN OPTICS		YES
JOURNAL OF NONLINEAR OPTICAL PHYSICS AND MATERIALS		NO
Journal of Optical Networking		NO
JOURNAL OF OPTICS A-PURE AND APPLIED OPTICS		NO
JOURNAL OF OPTICS B-QUANTUM AND SEMICLASSICAL OPTICS		NO
JOURNAL OF THE OPTICAL SOCIETY OF AMERICA A, OPTICS AND IMAGE SCIENCE		YES
JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B, OPTICAL PHYSICS		YES
JOURNAL OF OPTICAL TECHNOLOGY		YES
JOURNAL OF OPTOELECTRONICS AND ADVANCED MATERIALS		NO
JOURNAL OF PHYSICS B, ATOMIC, MOLECULAR AND OPTICAL PHYSICS		YES
JOURNAL OF RUSSIAN LASER RESEARCH		NO
Journal of the Society for Information Display		YES
JOURNAL OF SYNCHROTON RADIATION		NO
Journal of X-Ray Science and Technology		YES
LASERS IN ENGINEERING		NO
LASER FOCUS WORLD		YES
LASER PHYSICS		NO
Leukos : the journal of the Illuminating Engineering Society of North America.		YES
MICROELECTRONIC ENGINEERING		YES
MICROLITHOGRAPHY WORLD		YES
MICROWAVE AND OPTICAL TECHNOLOGY LETTERS		NO
Nature Photonics		NO
OPTICA APPLICATA		NO
OPTICS COMMUNICATIONS		YES
OPTICAL ENGINEERING		YES
OPTICS EXPRESS		YES
OPTICAL FIBER TECHNOLOGY		NO
OPTICS AND LASERS IN ENGINEERING		NO
OPTICS AND LASER TECHNOLOGY		YES
OPTICS LETTERS		YES
OPTICAL MATERIALS		YES
OPTICAL AND QUANTUM ELECTRONICS		NO
OPTICAL REVIEW		NO
OPTIKA I SPEKTROKOPIYA		NO
OPTIK		NO
OPTO-ELECTRONICS REVIEW		YES
Optoelectronics and Advanced Materials-Rapid Communications		NO
PHOTONICS SPECTRA		NO
Photonics and Nanostructures-Fundamentals and Applications		NO
PHOTONIC NETWORK COMMUNICATIONS		NO

PHYSICAL REVIEW A		YES
PROGRESS IN OPTICS		YES
QUANTUM AND SEMICLASSICAL OPTICS		NO

Results: Of the 64 optics journals listed by “Journal Citation Reports” Atkins Library subscribes to 34 (or 53 %) of the journals. Articles in journals that we do not have subscriptions for we can be obtained for patrons through our Interlibrary Loan service.

A search of the ‘Atkins Library Online Catalog’ reveals the following holdings with regard to relevant monographic literature (books and documents) in the collection. **The following is not meant to be exhaustive, but rather indicative of library holdings.**

LC Subject Headings or Keywords	Total # of Titles	# of Titles 2004+
Optical Communications (subj.head.)	108	7
Optical Materials (subj.head.)	12	1
Optical Properties Materials (subj.head.)	5	0
Optoelectronic Devices (subj.head.)	42	4
Fiber Optics (subj.head.)	114	5
Wireless Communication Sys.(subj.head.)	154	28

Conclusion: Although it is recommended that the Physics Department continue to purchase additional current monographic titles in the above listed subject areas and to continue subscribing to additional relevant journals and serials—I find that current Library holdings are adequate to support both the non-thesis and thesis options for the M.S. in Optical Science and Engineering Program.

Barbara Tierney *Barbara Tierney, Liaison Librarian to Dept. of Physics*, Feb. 24, 2009

Evaluator’s Signature

Date