



UNC CHARLOTTE

Application to Offer an Accelerated Master's Program

Originating Department: Physics and Optical Science

Submitted by: Dr. Donald Jacobs

Date Submitted: February 1, 2016

Program

On behalf of the Department/School of Physics and Optical Science, we request permission to implement an Accelerated Master's Program in Physics (BS) and Applied Physics (MS). Exceptional undergraduate UNC Charlotte students enrolled in certain undergraduate programs, as noted below, may be accepted into the Master of Science in Applied Physics and begin work toward a graduate degree before completion of the baccalaureate degree as stipulated below.

Goal

The goal of the Accelerated Master's Program is to recruit academically talented high school students to graduate programs at the University, and to support them through to graduation.

Mechanism

Students will begin *graduate* coursework in their senior year, although they will be mentored throughout their baccalaureate program. The Accelerated Master's Program will allow students to complete the bachelor's degree *and* the master's degree in less time than pursuing them singularly, and *the two degrees will be awarded simultaneously* after successful completion of all program requirements. Students will be eligible to participate in commencement ceremonies upon completing the requirements for both the bachelor's and the master's degrees.

This Accelerated Master's Program may also be accelerated in which up to 12 hours (no more than 12) earned at the graduate level may be substituted for required undergraduate hours. In other words, up to 12 hours of graduate work may be "double counted" toward both the baccalaureate and graduate degrees.

Please attach a degree map/program outline of the Accelerated Master's Program curriculum (the bachelor's and master's programs) to this request. If courses are accelerated and count toward the undergraduate degree, the Department Chair/School Director of the undergraduate program must also support this request. A separate degree map/program outline must be provided for each undergraduate program of study that can align with the graduate program.

Application and Admission Requirements

Students may be considered for admission to the Accelerated Master's Program while enrolled in high school if they have a minimum GPA ≥ 3.75 (on a 4.0 scale) and a minimum score of 1700 on the SAT. Students indicate on the freshman application for admission that they wish to be considered for admission to the Accelerated Master's Program, and the Undergraduate Admissions Office shares the record with the Graduate School (who shares it with the Graduate Program Director). If admitted, the student will receive one letter of admission to the baccalaureate and graduate program from the

Undergraduate Director of Admissions and the Associate Dean of the Graduate School. Enrollment will be based on program capacity, and certain programs may have more stringent admission policies or application deadlines.

Continuing Enrollment Requirements

Students must:

- maintain a strong academic record at the undergraduate and graduate levels, respectively (Cumulative GPA ≥ 3.0)
- maintain the minimum GPA or they will be placed on probation (from the graduate program) after the first semester of enrollment in the Accelerated Master's Program and will be dismissed from the graduate program at the end of the second semester
- meet all deadlines for licensure (if relevant) and graduation
- exhibit stellar performance in all field experiences, research, and coursework

Financial Aid and Tuition

Students may:


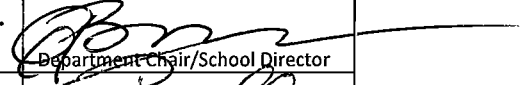

- be considered for undergraduate financial aid and funding prior to completion of 121 semester hours of undergraduate credit
- be considered for graduate financial assistance after completion of 120 semester hours of undergraduate credit
- be charged graduate tuition and fees after completion of all baccalaureate courses, generally beginning in the fifth year of study

Support

The academic program is expected to engage students continuously throughout their undergraduate and graduate programs. Towards this end, the following advising, mentoring, research, and financial support will be provided to participants in the Accelerated Master's Program:

- Advising: Dr. Donald Jacobs, MS Applied Physics graduate coordinator, will serve as advisor.
- Mentoring: Dr. Donald Jacobs will serve as initial mentor, and a research mentor will be sought.
- Research: All participating students will be required to do research (internal or external to UNCC).
- Financial: Internal scholarship funds will be sought, external scholarship awards will be aggressively sought.

Program Approval

Date Received	Date Considered	Date Forwarded	Action	Signature
2/1/16	2/1/16	2/1/16	support	 Graduate Program Director
2/1/16	2/1/16	2/1/16	support	 Department Chair/School Director
	2/29/16		Approve	 Graduate Dean

Application Submission

Please submit this Accelerated Master's Program application to: Dr. Thomas Reynolds, Dean of the Graduate School, 210 Cato Hall.

PROGRAM SUMMARY

- **Credit Hours:** 138 hours
- **Concentrations:** No
- **Declaring the Major:** Students should declare a Physics major in their freshman year, and enroll in the accelerated program.
- **Advising (For the Major and accelerated program):** Dr. Donald Jacobs email: djacobs1@uncc.edu, 704.687.8143
- **Advising (For General Education):** CLAS Advising Center
- **Minimum Grades/GPA:** Students must have a cumulative GPA of 3.0 or higher. All undergraduate minimums in the normal Physics B.S. program must be achieved, but it is expected that all participating students in this program will obtain a B or better in all Physics courses.
- **Teacher Licensure:** Yes: Physics
- **Evening Classes Available:** Yes (lower level only)
- **Weekend Classes Available:** No
- **Other Information:** The Department offers Honors in Physics where students must complete a research-based project. All the students in the accelerated Masters Applied Physics program will be required to obtain undergraduate research experience, and can participate in the undergraduate Honors distinction. All students in this program are expected to graduate with a M.S. thesis. If a student opts to submit an Honors undergraduate thesis in addition to a M.S. thesis, the Honors undergraduate thesis and M.S. thesis must be sufficiently distinct, however, the M.S. thesis can build upon the undergraduate Honors thesis if appropriately planned. All students participating in this program will have the same opportunities as other Physics majors that commonly seek dual undergraduate degrees with Electrical and Computer Engineering, Mechanical Engineering or Mathematics.
- **Contact(s):** Dr. Donald Jacobs, djacobs1@uncc.edu, 704.687.8143

PROGRAM REQUIREMENTS

The B.S./M.S. accelerated degree program is intended for students interested in working in a technical industry or attending graduate school for a PhD in physics or a related field. This 5-year program is highly structured where classes build upon another. Mentorship/advising is in place for students to develop professionally. A key aspect of the program is for students to actively build strong resumes (Curriculum Vita) by developing leadership skills, participating in research, and learning how to actively seek fellowships and paid research opportunities, including industrial internships. High achieving high school students will be recruited directly into this program. The minimum unweighted high school GPA is 3.75 and the minimum combined SAT score is 1700. Although the program is difficult to get into, the cohort of students in this program will be involved in both informal and formal functions together over the program that includes community service.

Areas	Credit Hours	Description
Pre-Major/ Prerequisites	-	AP credits can reduce time to graduation, but they are likely to free up time for professional development activities, undergraduate research experiences and to broaden possible electives.
Major	36-51	Some of the required courses in the major will count towards University General Education requirements for Natural Sciences, Oral Communications and Writing Intensive courses.
General Education (not satisfied by other major requirements)	21-24	These hours do not include those requirements which are satisfied within the major. Students with an associate's degree are exempt from most General Education requirements.
Related Work	16	Courses that are required pre-requisites for PHYS courses taken by all majors. These include CHEM and MATH courses.
Foreign Language	0-8	Students must demonstrate competence at the 1202 level. Competence can be demonstrated by transfer courses, placement exam, or courses at UNC Charlotte.
Electives	24-36	As needed to complete 120 hours total.
Graduate courses	18	18 credits must come from graduate level courses only, and 12 credits can be double counted.
Total Credit Hours	138	Most students require 5 years for a B.S. in Physics, especially if they double major. Over the same time span, this program allows a student to earn a M.S. in Applied Physics as well.

SUGGESTED PLAN OF STUDY – B.S. IN PHYSICS

Freshman Year					
Course Number	Course Title	Credit Hours	General Education	W/O Course	Notes
<i>Fall Semester</i>					
PHYS 1000	New Student Seminar	1			
MATH 1241	Calculus I	3	X		AP credit is possible
CHEM 1251 & 1251L	Principles of Chemistry I	4	X		AP credit is possible
UWRT 1101	Writing and Inquiry I	3	X		
LBST 11XX	LBST 110X Series: Arts and Society	3	X		
<i>Spring Semester</i>					
PHYS 2101	Physics for Scientists and Engineers I	3	X		AP credit is possible
PHYS 2101L	Physics for Scientists and Engineers I Laboratory	1			AP credit is possible
MATH 1242	Calculus II	3	X		
UWRT 1102	Writing and Inquiry II	3	X		
LBST 2101	Western Cultural and Historical Awareness	3	X		
XXXX XXXX	Social Science (General Education)	3	X		

30 Credit Hours for Year

Sophomore Year					
Course Number	Course Title	Credit Hours	General Education	W/O Course	Notes
<i>Fall Semester</i>					
PHYS 2102	Physics for Scientists and Engineers II	3			AP credit is possible
PHYS 2102L		1			AP credit is possible
MATH 2171	Differential Equations	3			
LBST 2102	Global and Intercultural Connections	3	X		
XXXX 1201	Foreign Language 1201	4			AP credit is possible
<i>Spring Semester</i>					
PHYS 3101	Topics and Methods of Physics	3			
PHYS 3141	Modern Physics	3			
MATH 2241	Calculus III	3			
PHYS 3210	Introduction to Computational Physics	3			
XXXX 1202	Foreign Language 1202	4			

30 Credit Hours for Year

Junior Year					
Course Number	Course Title	Credit Hours	General Education	W/O Course	Notes
<i>Fall Semester</i>					
PHYS 3121	Classical Mechanics I	3			
PHYS 3283	Advanced Lab in Classical Physics	3	X	W	
PHYS 3220	Mathematical Methods in Physics	3			
LBST 22XX	LBST 221X Series: Ethical Issues and Cultural Critique	3	X		
XXXX XXXX	Elective	3			
<i>Spring Semester</i>					
PHYS 4231	Electromagnetic Theory I	3			
PHYS 3282	Advanced Lab in Modern Physics	3	X	W,O	
PHYS 5222	Classical Mechanics II	3			Double counted toward M.S. in Applied Physics
XXXX XXXX	Elective	3			
XXXX XXXX	Elective	3			

30 Credit Hours for Year

Senior Year					
Course Number	Course Title	Credit Hours	General Education	W/O Course	Notes
<i>Fall Semester</i>					
PHYS 4241	Quantum Mechanics I	3			
PHYS 4232	Electromagnetic Theory II	3			Double counted toward M.S. in Applied Physics
PHYS XXXX	PHYS elective at 3000 or 4000 level	3			
XXXX XXXX	Elective	3			
XXXX XXXX	Elective	3			
<i>Spring Semester</i>					
PHYS 5151*	Thermal and Statistical Physics	3			Double counted toward M.S. in Applied Physics
PHYS XXXX	PHYS elective at 3000 or 4000 level	3			
PHYS 5242	Quantum Mechanics II	3			Double counted toward M.S. in Applied Physics
XXXX XXXX	Elective	3			
XXXX XXXX	Elective	3			

30 Credit Hours for Year

* A new class that planned to be offered starting in spring 2017, but is currently being offered as a special topics course.

List of courses for graduating year is on next page:

Graduating Year

Course Number	Course Title	Credit Hours	General Education	W/O Course	Notes
<i>Fall Semester</i>					
PHYS 6991	M.S. thesis research	3			
XXXX XXXX	Elective at 6000 level (any PHYS/OPTI, or up to 3 non PHYS/OPTI)	3			
XXXX XXXX	Elective at 6000 level (any PHYS/OPTI, or up to 3 non PHYS/OPTI)	3			
<i>Spring Semester</i>					
PHYS 6992	M.S. thesis research	3			
XXXX XXXX	Elective at 6000 level (any PHYS/OPTI, or up to 3 non PHYS/OPTI)	3			
XXXX XXXX	Elective at 6000 level (any PHYS/OPTI, or up to 3 non PHYS/OPTI)	3			

18 Credit Hours for Year

ADVISING RESOURCES

- General Education Requirements for ALL Students: ucol.uncc.edu/general-education
- Undergraduate Catalog: catalog.uncc.edu
- Graduate Catalog: catalog.uncc.edu
- Central Advising website: advising.uncc.edu
- College of Liberal Arts & Sciences advising website: clas.uncc.edu/students/Advising-News/
- University Advising Center website: advisingcenter.uncc.edu