QUANTUM COMPUTING, MS

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum degree requirements (https://guide.wisc.edu/graduate/#requirementstext) and policies (https://guide.wisc.edu/graduate/#policiestext), in addition to the program requirements listed below.

MAJOR REQUIREMENTS

MODE OF INSTRUCTION

Face to Face	Evening/ Weekend	Online	Hybrid	Accelerated
Yes	No	No	No	No

Mode of Instruction Definitions

Accelerated: Accelerated programs are offered at a fast pace that condenses the time to completion. Students typically take enough credits aimed at completing the program in a year or two.

Evening/Weekend: Courses meet on the UW–Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the advantages of face-to-face courses with the flexibility to keep work and other life commitments.

Face-to-Face: Courses typically meet during weekdays on the UW-Madison Campus.

Hybrid: These programs combine face-to-face and online learning formats. Contact the program for more specific information.

Online: These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.

CURRICULAR REQUIREMENTS

Requirements	Detail
Minimum Credit Requirement	30 credits
Minimum Residence Credit Requirement	16 credits
Minimum Graduate Coursework Requirement	15 credits must be graduate level coursework. Refer to the Graduate School's Minimum Graduate Coursework (50%) Requirement Policy: https://policy.wisc.edu/UW-1244 (https://policy.wisc.edu/UW-1244/)
Overall Graduate GPA Requirement	3.00 GPA required. Refer to the Graduate School: Grade Point Average (GPA) Requirement policy:https://https://policy.wisc.edu/library/UW-1203 (https://https://policy.wisc.edu/library/UW-1203/)
Other Grade Requirements	n/a
Assessments and Examinations	None.
Language Requirements	None.

REQUIRED COURSES

Code	Title	Credits
Core		
PHYSICS 701	Graduate Introductory Seminars	1
PHYSICS 707	Quantum Computing Laboratory	4
PHYSICS 709	Introduction to Quantum Computing	3
PHYSICS 763	Qubit Tune-Up and Programming	3
PHYSICS 779	Advanced Quantum Computing	3
Core Electives		
Students must complete at least 2 courses from the following:		6
PHYSICS 448	Atomic and Quantum Physics	
PHYSICS 449	Atomic and Quantum Physics	
PHYSICS 531	Introduction to Quantum Mechanics	
PHYSICS 545	Introduction to Atomic Structure	
PHYSICS 551	Solid State Physics	
PHYSICS 731	Quantum Mechanics	
PHYSICS 732	Quantum Mechanics	
Pathway [1]		
Students must complete their selected pathway courses to satisfy the minimum credit requirement. Refer to the appropriate pathway table below for specific requirements.		10
Total Credits		**30**

Software Pathway [1]

Code	Title	Credits
Quantum Algorithms		
Students in the Software Pathway must complete the following course:		
PHYSICS 765	Quantum Algorithms and Error Correction	3
Electives		
Students complete courses from the following:		7
COMP SCI 319	Data Science Programming I for Research	
COMP SCI 412	Introduction to Numerical Methods	
COMP SCI/ E C E 506	Software Engineering	
COMP SCI/ E C E/E M A/E P/ M E 759	High Performance Computing for Applications in Engineering	
PHYSICS 799	Independent Study	
Total Credits		**10**

Hardware Pathway [1]

Students must choose to complete the Atomic Molecular Optical (AMO) Option or the Solid State Option.

Atomic Molecular (AMO) Option

Code	Title	Credits
Fundamentals and Application		
Students in the AMO Option must complete the following courses:		
PHYSICS 623	Electronic Aids to Measurement	4
PHYSICS 625	Applied Optics	4
Elective		
Students complete courses from the following:		2-3
E C E 835	Light Interactions with Quantum Materials (Elective)	
PHYSICS 799	Independent Study	
Total Credits		**10**

Solid State Option

Code	Title	Credits
Fundamentals and Properties		
Students in the Solid State Option must complete the following courses:		
PHYSICS 623	Electronic Aids to Measurement	4
PHYSICS 551	Solid State Physics	3
Elective		
Students complete courses from the following:		3-4
E C E 549	Integrated Circuit Fabrication Laboratory	
PHYSICS 799	Independent Study	
Total Credits		**10**

[1] These pathways are internal to the program and represent different curricular paths a student can follow to earn this degree. Pathway names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

OTHER POLICY

Students in this program may not take courses outside the prescribed curriculum without faculty advisor and program director approval. Students in this program cannot enroll concurrently in other undergraduate or graduate degree programs.