rev. 11/9/23

Physics Major - Professional Track (BS) Checklist
Students entering before Fall, 2023

Student name: _____ SPIRE #: _____ Advisor name & date: _____

Courses needed to meet departmental graduation requirements (which must be taken for a letter grade, not Pass/Fail) are shown in **boldface**.
This checklist shows departmental requirements - it does *not* show all University, College, and Gen-Ed requirements.
Current Gen-Ed requirements are listed here: https://www.umass.edu/gened/sites/default/files/cpg_admitted_students_f2018_rev.pdf

FRESHMAN COURSES

	Course (sems. offered) pre- and co-requisites	Course title or description	Cr	Sem. taken + grade, or semester planned	Career / professional development
F1	**PHYS 181 (F)** co: M131	Physics I (Mechanics)	4		• Try Handshake • Write resume • Get to know at least one faculty member • Use "career development checklist"
	PHYS 185 (F)	Freshman Colloquium (recommended)	1		
	MATH 131 (F,S)	Calculus I (or higher if have M131 credit)	4		
	Other	• First-year freshman seminar • GenEd DU or DG • ENGWRT112 if available in Fall	1 4 3		
Physics 181 can usually be waived if Physics 151 has been passed at UMass or transferred from another college or university. AP credit for Physics 151 will *not* count in place of Physics 181.					
S1	**PHYS 182 (S)** pre: P181/P151 co: M132	Physics II (E&M)	4		• Apply for summer job/internship: start in Dec., due in Feb. • Consider on-campus research, teaching, or outreach activities. • Meet with CNS career center.
	MATH 132 (F,S) pre: M131	Calculus II (or higher if have M132 credit)	4		
	PHYS 192M (S)	Intro/Measurement *w*/Arduino (recommended)	1		
	Other (optional)	• Practicum (research *w*/ faculty) • PHYS 281 (S1 or F2 – talk to advisor) • GenEd DU or DG if not already taken • ENGWRT112 if not already taken	1-3 3 4 3		
Physics 182 can usually be waived if Physics 152 has been passed at UMass or transferred from another college or university. AP credit for Physics 152 will *not* count in place of Physics 182.					

SOPHOMORE COURSES

Starting AY24-25 P282-P289 are replaced by P271-P277

F2	**PHYS 281 (F,S)** pre: P181/P151 and M132 co: P182 /P152	Computational Physics	3		• Consider on-campus research, teaching, or outreach activities. • Meet with CNS career center.
	PHYS 287 (F) pre: P181/P151 and M132	Physics III: Thermo, Waves, Optics	3		
	PHYS 289 (F) co: P287	Sophomore Physics Lab I	2		
	MATH 233 (F,S) pre: M132	Calculus III, multivariable	3		
	Other (optional)	• MATH 235 (F,S) Linear Algebra • TA, NATSCI 293A, research practicum, or indep. study	3		
S2	**PHYS 282 (S)** pre: M233	Mathematical Methods of Physics	3		• Apply for summer job/internship: start in Dec., due in Feb.
	PHYS 284 (S) pre: P181/151. P182/P152, and M233	Physics IV: Modern Physics	3		
	PHYS 286 (S) co: P284	Sophomore Physics Lab II	2		
	MATH 331 (F,S) pre: M132	Ordinary Differential Equations	3		
	Other (optional)	• Math 235 (F,S) Linear Algebra • PHYS 392P (S) Prof. Development	3 1		

JUNIOR AND SENIOR COURSES

P440 may be taken in the junior year, rather than in the senior year as shown here. In this case one of the four courses P421-P424 should usually be moved to the senior year to balance the course load.

F3	**PHYS 421 (F)** pre: P287	Mechanics	4		● Join on-campus research, teaching, or outreach activities. ● Meet with CNS career center. ● Apply for REU; applications due Jan.-Feb.
	PHYS 424 (F) pre: P282 and P284	Quantum Mechanics	4		
	PHYS 381 (F or S) pre: P284	Writing in Physics Open to junior and senior physics majors only	3		
	Other (optional)	● TA, or research practicum ● MATH 421 (F,S) Complex Variables	1-3		
S3	**PHYS 422 (S)** pre: P182/P152, P282, and M233	Electricity and Magnetism	3		● Apply for summer job/internship: start in Dec., due in Feb.
	PHYS 423 (S) pre: P284 and M233	Statistical Physics	3		
	Other (optional)	● Advanced course from list below ● PHYS 381 if not yet taken ● PHYS 498G if considering PhD ● PHYS 392P Professional Development	3-4 3 1 1		
F4 & S4	**PHYS 440 (F or S)** pre: P286, P381 highly recommended	Intermed. Lab (ILAB) Permission of instructors is always required due to limited space in ILAB	4		● Join on-campus research, teaching, or outreach activities. ● Apply for jobs or graduate programs
	Advanced Course prerequisites vary by course	Choose from the list below	3-4		
	Other (optional)	● Other electives or skills courses ● Research	3 1-3		

Advanced course requirement. One course from:

- 500-level Physics courses: P531 Electronics, P537/P597Q Quantum Computation, P551 Biological Physics, P553 Optics, P556 Nuclei and Elementary Particles, P558 Solid State, P562 Advanced E&M, P564 Advanced Quantum Mechanics, P568 General Relativity, P569/P597G Advanced topics in GR, or other 500-level physics course if approved in advance by UPD.
- Certain upper-level Astronomy courses: A337 Optical and IR Astronomy, or A452H Astrophysics II.
- **Many physics majors will want to take more than one advanced course** to meet their educational goals. For example P562 Advanced E&M and P564 Advanced QM are both useful for students intending to apply to a PhD program.

Most of these advanced courses are only offered in one semester (Fall or Spring), and some are not offered every year. Consult your advisor when planning your advanced course(s).