Recommended Academic Plan for Astronomy & Astrophysics - Graduate Studies Option (ASTRO - GRDST at UP)

Effective Summer 2008

Semester 1	Credits	Semester 2	Credits
MATH 140 (GQ) Calculus with Analytic Geometry I	4	**MATH 141** (GQ) Calculus with Analytic Geometry II	4
PHYS 211 (GN) General Physics: Mechanics	4	**PHYS 212** (GN) General Physics: Electricity & Magnetism	4
CHEM 110 (GN) Chemical Principles I	3	CHEM 111 (GN) Experimental Chemistry I	1
General Education course (GA/GH/GS)	3	CHEM 112 (GN) Chemical Principles II	3
First-Year Seminar (ASTRO 020S)	2	*ENGL 015 or 030* (GWS) Composition/Honors Comp.	3
		Health/Kinesiology course (GHA)	1.5
Total Credits:	16	Total Credits:	16.5
Semester 3	**Credits**	**Semester 4**	**Credits**
ASTRO 291 (GN) Astronomical Methods & the Solar System	3	**ASTRO 292** (GN) Astronomy of the Distant Universe	3
MATH 230 Calculus and Vector Analysis	4	MATH 251 Ordinary and Partial Differential Equations	4
PHYS 213 (GN) General Physics: Fluids & Thermal Physics	2	PHYS 237 Introduction to Modern Physics	3
PHYS 214 (GN) Gen. Physics: Wave Motion & Quantum Phys.	2	CMPSC 121 (GQ) Intro to Programming Techniques	3
CAS 100 (GWS) Effective Speech	3	General Education course (IL/US: GA/GH/GS)	3
Total Credits:	14	Total Credits:	16
Semester 5	**Credits**	**Semester 6**	**Credits**
ASTRO 320 (GN) Observational Astronomy Laboratory	2	**ASTRO 4xx** (Select a 3-credit 400-level ASTRO course)	3
ASTRO 4xx (Select a 3-credit 400-level ASTRO course)	3	*ENGL 202C* (GWS) Effective Writing: Technical	3
MATH 405 Advanced Calculus for Engineers & Scientists or MATH 411 Ordinary Differential Equations or MATH 417	3	CMPSC/MATH/STAT (*see Notes 3*) *Select 3 credits of a 300-level or 400-level course*	3
PHYS 419 Theoretical Mechanics	3	PHYS 400 Intermediate Electricity and Magnetism I	3
General Education course (IL/US: GA/GH/GS)	3	General Education course (GA/GH/GS)	3
Health/Kinesiology course (GHA)	1.5		
Total Credits:	15.5	Total Credits:	15
Semester 7	**Credits**	**Semester 8**	**Credits**
ASTRO 4xxW (Select a 3-credit 400-level ASTRO W course)	3	**ASTRO 4xx** (Select a 3-credit 400-level ASTRO course)	3
PHYS 410 Introduction to Quantum Mechanics I	4	PHYS 4xx (Select a 400-level PHYS course - *see Notes 4*)	3
PHYS 4xx (Select a 400-level PHYS course - *see Notes 4)*	3	Supporting Course (Select 3 credits - *see Notes 5*)	3
General Education course (GA/GH/GS)	3	Supporting Course (Select 3 credits)	3
General Education course (GA/GH/GS)	3	Supporting Course (Select 4 credits)	4
Total Credits:	16	Total Credits:	16

-**Bold** type indicates courses requiring a quality grade of C or better.
· *Italics* indicate courses that satisfy both major and General Education requirements.
· ***Bold Italics*** indicate courses requiring a quality grade of C or better and that satisfy both major and General Education requirements.
· GWS, GHA, GQ, GN, GA, GH, and GS are codes used to identify General Education requirements.
· US, IL are codes used to designate courses that satisfy University United States (US) and International (IL) Cultures requirements. These credits can be acquired concurrently with GA, GH, and/or GS courses.
· W is the code used to designate courses that satisfy University Writing Across the Curriculum requirement.

Program Notes:
1. ASTRO 4xx: Choose from ASTRO 400H, 410, 420W, 440, 451, 475W, 480, 485 and 497 courses (except ASTRO 496).
2. For the required writing-intensive coursework we recommend taking ASTRO xxxW courses (e.g., ASTRO 420W, ASTRO 475W).
3. Suggested CSE/MATH/STAT courses: CMPSC 451/MATH 451, CMPSC 455/MATH 455, MATH 318/STAT 318, MATH 406, MATH 411, MATH 412, MATH 461, STAT 301, STAT 401. (MATH 419 cannot be used because it is identical to PHYS 419.)
4. Choose 6-7 credits from PHYS 401, 402, 406, 411, 420, 457 (2-3 credit options), 461, and EE 490.
5. See the Undergraduate Handbook and your advisor for recommended supporting courses.