Climate and Space Sciences and Engineering
2018-2019 Sample Schedule: B.S.E Space Science and Engineering

	Semester:		1	2	3	4	5	6	7	8
Subjects required by all programs (55 hrs.)		***hrs.***								
Mathematics 115, 116, 215, and 216		**16**	4	4	4	4	–	–	–	–
ENG 100 Intro to Engr		**4**	4	–	–	–	–	–	–	–
ENG 101 Intro to Computers		**4**	–	4	–	–	–	–	–	–
Chemistry 125/126 and 130 or Chemistry 210/211		**5**	5	–	–	–	–	–	–	–
Physics 140/141; 240/241		**10**	–	5	5	–	–	–	–	–
Humanities and Social Sciences		**16**	4	4	4	4	–	–	–	–
Required Core Courses (30 hrs.)										
SPACE 320 Earth and Space System Evolution		**3**	–	–	3	–	–	–	–	–
SPACE 321 Earth and Space System Dynamics		**3**	–	–	–	3	–	–	–	–
SPACE 323 Earth System Analysis		**4**	–	–	–	4	–	–	–	–
SPACE 370 Solar-Terrestrial Relations		**4**	–	–	–	–	4	–	–	–
SPACE 462 Instrumentation for Atmospheric & Space Sciences		**4**	–	–	–	–	–	4	–	–
SPACE 478 Space Environment		**4**	–	–	–	–	–	–	4	–
SPACE 405 Data Analysis and Visualization (Note 1)		**4**	–	–	–	–	–	–	–	4
SPACE 495/595 (Note 2)		**4**	–	–	–	–	–	–	–	4
Total		**85**	**17**	**17**	**16**	**15**	4	4	4	8
Concentrations: (select one)										
Space Science: (43 hrs. total)										
PHYSICS 340 Waves, Heat and Light		**3**	–	–	–	–	**3**	–	–	–
SPACE 380 Introduction to Radiative Transfer		**3**	–	–	–	–	3	–	–	–
PHYSICS 405 Intermediate Electricity and Magnetism (Note 5)		**4**	–	–	–	–	–	4	–	–
PHYSICS 390 Modern Physics (Note 5)		**3**	–	–	–	–	–	3	–	–
PHYSICS 391 Lab		**2**	–	–	–	–	–	2	–	–
NERS 471 Introduction to Plasmas		**3**	–	–	–	–	–	–	3	–
SPACE 499/455 Capstone Research (Note 3) or SPACE584		**4**	–	–	–	–	–	–	–	4
Technical Electives		**11**	–	–	–	–	3	–	4	4
Unrestricted Elective		**10**	–	–	–	–	3	3	4	–
Total		**128**	**17**	**17**	**16**	**15**	16	**16**	**15**	**16**
Space Instrumentation: (43 hrs. total)										
Engineering Breadth (programming or EECS 215 Intro to Electronic Circuits) (Note 4)		**4**	–	–	–	–	**4**	–	–	–
SPACE 310 Small Satellite Design		**3**	–	–	–	–	–	3	–	–
SPACE 405 Astrophysics Engineering (Note 1)/ SPACE 431 Radiowave Propagation (Note 9)		**3/4**	–	–	–	–	–	–	3/4	--
Sensors/Data/Stats Course/AERO 305 (Note 8)		**3/4**	–	–	–	–	–	–	--	3/4
SPACE 405 Space Sciences Instrumentation (Note 1 and 6)		**3**						3		
SPACE 477 Space Weather Modeling		**4**	–	–	–	–	–	–	-	4
Technical Electives		**11/10**	–	–	–	–	4	3	4/3	-
Unrestricted Electives		**12**	–	–	–	–	4	4/3	4	-
Total		**128**	**17**	**17**	**16**	**15**	**16**	**17/ 16**	**15**	**16/ 17**

Note 1. New Course.
Note 2. Students should take one of these courses (each offered every other year).
Note 3. New Course. Student may take either year-long (2 CR each term) SPACE 499 Directed Study as a Senior Thesis option or SPACE 455 Senior Capstone Design.
Note 4. Recommend students minor in another Engineering Discipline. If not, an intro CS, ME, EECS, MATSCI course. CoE Bulletin describing minors: https://bulletin.engin.umich.edu/ug-ed/engin-minors/
Note 5. Students need to request waiver to Physics 351 for 405 or take 351 as a Tech Elective.
Note 6. The Instrumentation course is also useful for our PhD students to learn about techniques and is a “theory” course.
Note 7. Physics no longer offered 341, so need to delete this course. Increase unrestricted.
Note 8. CEE 575 Sensing for Civil Infrastructure Systems (3 cr) and Data; STATS 412 Introduction to Probability and Statistics (3 cr) or AERO 305 Aero Engineering Lab I (4 cr). If AERO 305 is taken reduce Unrestricted Elective from 12 to 11 credits. Have discussed AERO 305 option with instructor.
Note 9. SPACE 405 and 431 are Every-other-year courses. If 431 is taken, reduce Tech Elective requirement from 11 to 10 credits