Major Progress Tracker: Computational Biology
You must earn a grade of 'C' or better in all courses for the major.
This includes elective courses taken in CHEM, MATH, NROSCI, PHYS, and STAT

Name		PS #		Date	

TARGET GRADUATION DATE:

Biology Core (BIOSC)	Cr	Grade	Notes
0150 Foundations Bio 1 (UHC0155)	3		
0160 Foundations Bio 2 (UHC0165)	3		
0350 Genetics	3		
1000 Biochemistry	3		

Computer Science Core	Pre-Req	Cr	Grade	Notes
0011 Intro to Computing for Scientists (Python)	None	4		
CMPINF 0401 Intermediate Comp Prog	None	4		
0441 Discrete Structures	MATH 0220	3		
0445 Algorithms Data Structures 1	CMPINF 0401	3		
1501 Algorithms Data Structures 2	CS 0441 & 0445	3		
1656 Introduction to Data Science	CS 1501	3		

Required Computational Biology Courses	Cr	Grade	Notes
BIOSC 1542, 1544, 1630, & 1640 require a C or higher in BIOSC 1540			
BIOSC 1540 Computational Biology (F)	3		
BIOSC 1542 Computational Genomicsº (Sp†even) **OR** BIOSC 1544 Simulation and Modelingº (Sp†odd)	3		
BIOSC 1640 Comp Bio Research∞ (Sp)	3		
(Comp Bio Elect) See next page for a list of approved courses	3-4		

Capstone	Cr	Grade	Notes
1630 Sr Seminar Comp Bio *(WRIT) (F)*	2		

General Education Requirements *(Fall 2018 & later)*

Wrkshp Comp _____   Sem in Comp _____

Writ #1 _____   Writ #2 ____ (in BIOSC)

Algebra _____   Quant Formal Reas. _____

2nd Language _____

Diversity Course _____
The Diversity course may be used to fulfill another General Education Requirement.

Division Requirements (Humanities, Arts, Social Sciences, Natural Sciences)

Literature _____

The Arts _____

Creative Work _____

Philosophical Thinking/Ethics _____

Social Science _____

Historical Analysis _____

Natural Sciences   *Fulfilled by Major*

Global Awareness & Cultural Understanding

Global Issues _____

Geographic Region _____

Cross-Cultural Awareness _____

120 TOTAL credits required for degree	Date	Co-req GPA	Core GPA (BIOSC + CS)

See p.2 for GPA calculation details

CO-REQUISITES for Major (Chem, Math, Stat):							
You must average a 2.000 GPA in your co-requisite courses.							
Chemistry	Cr	Grade	Notes	**Math & Statistics**	Cr	Grade	Notes
CHEM 0110 General Chemistry 1 (must include lecture and lab)	4			MATH 0220 Calculus I	4		
CHEM 0120 General Chemistry 2 (must include lecture and lab)	4			STAT 1000 Applied Statistics	4		
CHEM 0310 Organic Chemistry 1	3						

NOTES on Courses for the Major			
BIOSC 1000	May substitute BIOSC 1810 + 1820 for 6 credits (including 3 elective credits)	CS 0011 requirement	Students may test out of CS 0011 OR substitute CS 0010 or 0012. Email BioAdv@pitt.edu for details.
BIOSC 1542 and 1544 Pre-reqs	C or higher in BIOSC 1540 + CS 0011	CMPINF 0401	While this course does not have a pre-requisite, it is crucial that students have some programming experience. If you don't, you should take CS 0011 first.
BIOSC 1640 Pre-reqs	C or higher in BIOSC 1540 + CS 0011		
BIOSC 1640 Alternative	You may substitute CS 1640 but we recommend that DSAS students take BIOSC 1640. CS 1640 requires BIOSC 1540 + CS 1501.	S/NC Grade Option	Only ONE BIOSC/CS/COMPINF/Elective class may be taken with the Satisfactory/No Credit (S/NC) grade option.
STAT 1000 Alternative	MATH 0280 or 1180 (Linear Algebra) + CS 1503 (Mathematical Foundations of Machine Learning) can be substituted for STAT 1000. CS 1503 also requires CS 0441 as a pre-req.		

Major Progress Tracker: Computational Biology
You must earn a grade of 'C' or better in all courses for the major.
This includes elective courses taken in CHEM, MATH, NROSCI, PHYS, and STAT

Note on Major Timeline
This major is designed to be completed in 4 academic years. Specific course sequencing cannot be changed. If you are looking for a major that can be completed in fewer than 4 academic years, we offer a BS in Biological Sciences which is much more flexible in course sequencing. Occasionally a student bringing in transfer credit may have a different timeline; please see a Bio Advisor to discuss.

Notes About Grades:

If a C- or lower is earned in the Comp Bio elective course for the major and is not repeated, the course will not be counted toward the major, but will be used to calculate the overall GPA and the GPA for the major.

Only ONE BIOSC/CS Core class may be taken with the Satisfactory/No Credit (S/NC) grade option.

Approved Computational Biology Electives:

Course	Credits	Pre-Req
$BIOSC 0351 Genetics Lab	1	BIOSC 006X
BIOSC 0370 Ecology	3	BIOSC 0160
$BIOSC 1005 Introduction to Biochemistry Lab	1	BIOSC 1000; BIOSC 006X
BIOSC 1130 Evolution	3	BIOSC 0350
$BIOSC 1285 Genomics Lab	1	BIOSC 0350; BIOSC 006X
BIOSC 1320 Population Biology	3	BIOSC 0370
BIOSC 1470 Biophysical Chemistry	3	BIOSC 1000 or 1810
BIOSC 1500 Cell Biology	3	BIOSC 1000 or 1810
BIOSC 1520 Developmental Biology	3	BIOSC 0350
BIOSC 1545 Mathematics of Biology	3	BIOSC 0160; MATH 0220
BIOSC 1760 Immunology	3	BIOSC 0350
BIOSC 1820 Metabolic Pathways and Regulation	3	BIOSC 1810
BIOSC 1850 Microbiology	3	BIOSC 0160; CHEM 0120
BIOSC 1940 Molecular Biology	3	BIOSC 0350, 1000
CHEM 0250 Analytical Chemistry	3	CHEM 0120
CHEM 0320 Organic Chemistry 2	3	CHEM 0120
CHEM 1460 Intro to Modern Computational Sci	3	CHEM 0320
CHEM 1830 Synthetic Biology	3	BIOSC 1000/1810 or CHEM 1810
CS 1502 Formal Methods in Computer Science	3	CS 0441, 0445
CS 1520 Programming Languages for Web Apps	3	CS 0445
CS 1555 Database Management Systems	3	CS 1501
CS 1566 Introduction to Computer Graphics	3	CS 0447; MATH 0280
CS 1675 Introduction to Machine Learning	3	CS 1501; STAT 1000
MATH 0230 Analytical Geometry and Calculus 2	4	MATH 0220
MATH 0280 Intro to Matrices and Linear Algebra	3	MATH 0220
NROSCI 1000 Introduction to Neuroscience	3	BIOSC 0160; CHEM 0120
PHYS 0174 Basic Physics, Science & Engineering 1	4	MATH 0220
STAT 1221 Applied Regression	3	STAT 1000 Min Grade B-

$*Need 005X, 006X, and one upper division lab to count as a Computational Biology elective.*

BIOSC 1690 and 1900-1909 are not usable as elective credits for major.

Grade and GPA Requirements:

a) Your corequisite GPA (chem, math, stat) must *average* to 2.000 or better. [Thus, a grade lower than C in Math, Chemistry or Statistics can be used if the co-req GPA still averages to 2.000. See **exceptions** below.]

- **Exceptions**:
  i. Students must earn a grade of C (not C-) or better in CHEM 0110 and CHEM 0120 for the major.
  ii. If a chem, math, stat class is a pre-requisite with a grade minimum for a higher level class.

Questions should be directed to BIOSC (bioadv@pitt.edu) or SCI (sciadvising@pitt.edu)