

## Mathematical and Scientific Computation B.S. (Biology Emphasis)

### SAMPLE SCHEDULE

YEAR 1	YEAR 2
<u>FALL QUARTER:</u> MAT 21A	<u>FALL QUARTER:</u> MAT 21D, ENG 6
<u>WINTER QUARTER:</u> MAT 21B	<u>WINTER QUARTER:</u> MAT 22A
<u>SPRING QUARTER:</u> MAT 21C, ECS 32A	<u>SPRING QUARTER:</u> MAT 22B, MAT 108
YEAR 3	YEAR 4
<u>FALL QUARTER:</u> MAT 127A, MAT 1XX	<u>FALL QUARTER:</u> MAT 150A, MAT 128A
<u>WINTER QUARTER:</u> MAT 127B, MAT 135A, 1 biology course	<u>WINTER QUARTER:</u> MAT 128B, MAT 1XX
<u>SPRING QUARTER:</u> MAT 127C, MAT 124	<u>SPRING QUARTER:</u> MAT 128C, Capstone

### Requirements

PREPARATORY COURSEWORK (27-31 units): Plan to complete these by the end of sophomore year.				
Course	Units	Qtr(s) Offered	Year	Prerequisites & Enrollment Restrictions
<input type="checkbox"/> MAT 21A (Calculus: Differential Calculus)	4	F W S SSI SSII		Math placement exam score of 35 or higher (& 3 or higher on trig subscore)
<input type="checkbox"/> MAT 21B (Calculus: Integral Calculus)	4	F W S SSI SSII		21A or 21AH with C- or above; or 17A with B or above
<input type="checkbox"/> MAT 21C (Calculus: Partial Derivatives & Series)	4	F W S SSI SSII		21B, 21BH, 16C, or 17C with a C- or above; or 17B with a B or above
<input type="checkbox"/> MAT 21D (Vector Analysis)	4	F W S SSI SSII		21C or 21CH with a C- or above; or 17C with a B or above
<input type="checkbox"/> Choose between (22A/27A and 108) or 67:				
<input type="checkbox"/> MAT 22A (Linear Algebra) <b>OR</b> MAT/BIS 27A (Linear Algebra w/ Applications to Bio)	3	F W S SSI SSII		21C or 21CH with a C- or above; AND ENG 6 or concurrent enrollment in 22AL
<input type="checkbox"/> <b>AND</b> MAT 108 (Intro to Abstract Math)	4	W		17C or 21C or 21CH C- or above
<input type="checkbox"/> <b>OR</b> MAT 108 (Intro to Abstract Math)	4	F W S SSI SSII		21B (but not recommended until you complete 21C)
<input type="checkbox"/> <b>OR</b> MAT 67 (Modern Linear Algebra)**	4	W		21C or 21CH with a C- or above. <i>See note below.</i>
<input type="checkbox"/> MAT 22B (Differential Equations) <b>OR</b> MAT/BIS 27B (Differential Equations w/ Applications to Bio)	3	F W S SSI SSII		22/27A or 67 with C- or above
MAT/BIS 27B (Differential Equations w/ Applications to Bio)	4	S		27A C- or above; or 22A C- or above AND (22AL or ENG 6 OR EME 5 C- or
<input type="checkbox"/> ENG 6 (Engineering Problem Solving)	4	F W S SSII		16A, 17A, or 21A, C- or above; AND 16B, 17B, or 21B with a C- or above (may be taken concurrently)
<input type="checkbox"/> ECS 32A (Intro to Programming)***	4	F W S		Please wait to take this class until after your first quarter.

#### NOTES

\*\* MAT 67 is a more abstract, rigorous version of 22A and 108. Recommended if you earn all A's in MAT 21ABC and like theory.

\*\*\* ECS 32A can be replaced by ECS 10, 30, 40, 32B, 34, 36A, 36B, or 36C.

<b>DEPTH COURSEWORK (51 units):</b> Plan to complete these during your junior and senior years.					
	<b>Course</b>	<b>Units</b>	<b>Qtr(s) Offered</b>	<b>Year</b>	<b>Prerequisites &amp; Enrollment Restrictions</b>
<input type="checkbox"/>	MAT 127A (Real Analysis)	4	F W S SSI		21C; and (22/27A and 108) or 67
<input type="checkbox"/>	MAT 127B (Real Analysis)	4	F W S SSII		127A
<input type="checkbox"/>	MAT 127C (Real Analysis)	4	F W S SSI		127B
<input type="checkbox"/>	MAT 128A (Numerical Analysis)	4	F W SSII		21C and (ECS 32A or ENG 6)
<input type="checkbox"/>	MAT 128B (Numerical Analysis in Solution of Equations)	4	W		21C and 22/27A and (ECS 32A or ENG 6)
<input type="checkbox"/>	MAT 128C (Numerical Analysis in Differential Equations)	4	S		21C and 22/27A and 22/27B and (ECS 32A or ENG 6)
<input type="checkbox"/>	MAT 135A (Probability)	4	F W S SSI		21C; and (108 or 127A)
<input type="checkbox"/>	MAT 150A (Modern Algebra)	4	F W SSI		(22/27A and 108) or 67
<input type="checkbox"/>	MAT 124 (Mathematical Biology)	4	S (even yrs)		22/27B; (22/27A or 67)
<input type="checkbox"/>	Enrichment Class (MAT 111 - 185B, excluding 180)	4	See below for more information about Enrichment options.		
<input type="checkbox"/>	Enrichment Class (MAT 111 - 185B, excluding 180)	4			
<input type="checkbox"/>	Biology Class	4	See below for more information about Computation Class options.		
<input type="checkbox"/>	Capstone	3	See below for more information about Capstone options.		

*Information above is subject to change, based on changes to course offerings, prerequisites, etc.*

### **ENRICHMENT CLASSES**

You are required to take 2 Enrichment Classes. Enrichment classes are any class from **MAT 111 through MAT 185B, excluding MAT 180 and any core classes** (e.g. MAT 127ABC, 135A).

◦ See [catalog.ucdavis.edu/programs/MAT/MATcourses.html](https://catalog.ucdavis.edu/programs/MAT/MATcourses.html) for a list of all possible Math Enrichment classes & their prereqs. Pick ones that look interesting!

Note: your faculty advisor can also help with this. Find their contact info here: <https://www.math.ucdavis.edu/undergrad/advising/advisers/>

### **BIOLOGY CLASS**

Choose any 1 of the following: **ECS 124, 129, 170; EVE 101, 102, 175; EBS 130; ESP 121; MCB 121, 161 162; NPB 105, 163/198**

◦ See [catalog.ucdavis.edu](https://catalog.ucdavis.edu) to learn more about each of these classes. Note that they have prerequisites. Plan accordingly.

### **CAPSTONE**

You are required to complete 1 of the following options before graduation (typically in your last year).

- One of the in-depth math courses: **MAT 115B, 118B, 119B, 135B, 146, 150B, 150C, or 185B.**
- **MAT 180** (Special Topics class). Offered F, W, S. Topic changes every quarter: <https://www.math.ucdavis.edu/courses/syllabi/special-topics/>
- **MAT 189** (Advanced Problem Solving). Offered irregularly (usually spring). Project-based class with written and verbal presentations.
- **MAT 194** (Undergrad Thesis). Requires that you find a faculty member who will work with you. 2 quarter commitment minimum. <https://www.math.ucdavis.edu/undergrad/research/thesis/>