

## Mathematical Analytics and Operations Research (B.S.) 2019-2020 Requirements

**PREPARATORY COURSEWORK (39-43):** 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 and 108) or 67:				
<input type="checkbox"/> MAT 22A (Linear Algebra) <b>AND</b>	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"/> 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)	3	F W S SSI SSII		22A or 67 with C- or above
<input type="checkbox"/> Choose between ENG 6 or (ECS 32A and MAT 22AL):				
<input type="checkbox"/> ENG 6 (Engineering Problem Solving), <b>OR</b>	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"/> MAT 22AL (MATLAB) <b>AND</b>	1	F W S SSI SSII		16C, 17C, or 21CH
<input type="checkbox"/> ECS 32A (Intro to Programming)***	4	F W S		Please wait to take this class until after your first quarter.
<input type="checkbox"/> ECN 1A (Microeconomics)	4	F W S SSI SSII		
<input type="checkbox"/> ECN 1B (Macroeconomics)	4	F W S SSI SSII		
<input type="checkbox"/> STA 32 or STA 100	4			

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

### 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.

### RESOURCES

**Calculus Room:** Free tutoring for MAT 21A, 21B, 21C, and 21D. Located in MSB 1118 and typically open MTWR from 10-7PM and F from 10-6PM.

More info: <https://tutoring.ucdavis.edu/>

**Academic Assistance and Tutoring Centers (AATC):** Free tutoring and assistance with MAT 21A, 21B, 21C, 21D, 22A, and 22B. Hours and locations vary and can be found here: <http://success.ucdavis.edu/services/mathematics.html>

**STEM Cafe:** A friendly, collaborative, and informal setting for students of all gender identities in math and other science classes to work on homework and discuss the subject. Assistance is available for a variety of classes, sometimes including upper division classes. STEM Café is hosted by the Women's Resources and Research Center (WRRRC) in North Hall 125. Time and day varies by quarter. More info: <http://wrrc.ucdavis.edu/stem.html>

**DEPTH COURSEWORK (51 units):** Plan to complete these during your junior and senior years.

Course	Units	Qtr(s) Offered	Year	Prerequisites & Enrollment Restrictions
<input type="checkbox"/> MAT 127A (Real Analysis) - <i>or former MAT 25</i>	4	F W S SSI		21C or 21CH; and (22A and 108) or 67
<input type="checkbox"/> MAT 127B (Real Analysis) - <i>or former MAT 125A</i>	4	F W S SSII		127A
<input type="checkbox"/> MAT 127C (Real Analysis) - <i>or former MAT 125B</i>	4	F W S SSI		127B
<input type="checkbox"/> MAT 135A (Probability)	4	F W S SSI		21C; and (MAT 108 or MAT 025)
<input type="checkbox"/> MAT 135B (Stochastic Processes)	4	S		135A
<input type="checkbox"/> Choose any <u>1</u> of the following classes:	4			
<input type="checkbox"/> MAT 128A (Numerical Analysis)	4	F	SSII	21C and programming course
<input type="checkbox"/> MAT 128B (Numerical Analysis in Solution of Equations)	4	W		21C and 22A and programming course
<input type="checkbox"/> MAT 128C (Numerical Analysis in Differential Equations)	4	S		21C and 22A and 22B and programming course
<input type="checkbox"/> MAT 150A (Modern Algebra)	4	F W SSII		(22A and 108) or 67
<input type="checkbox"/> MAT 160 (Math for Data Analytics & Decision Making)	4	S		167
<input type="checkbox"/> MAT 168 (Optimization)	4	F W		(22A and 108) or 67; 21C
<input type="checkbox"/> Enrichment A (e.g. MAT 167)	4	See below for more information about Enrichment A options.		
<input type="checkbox"/> Enrichment A	4			
<input type="checkbox"/> Enrichment B	4			
<input type="checkbox"/> Enrichment B	4	See below for more information about Enrichment B options.		
<input type="checkbox"/> Enrichment B	4			
<input type="checkbox"/> Capstone	3	See below for more information about Capstone options.		

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### ENRICHMENT A OPTIONS

You are required to take 2 Enrichment A Classes. Approved Enrichment A classes include the following: any class from **MAT 111 through MAT 185B** (excluding MAT 180 and any core classes); **STA 131B, 131C, 137, 141A, 141B, 141C**.

◦ 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/>

◦ Find out when the classes you're interested in are offered:

- Academic Year: <https://www.math.ucdavis.edu/courses/academic-schedule>

- Summer:

<https://www.math.ucdavis.edu/courses/summer>

### ENRICHMENT B OPTIONS

You are required to take 2 Enrichment B Classes. Approved Enrichment B classes include the following: **ECN 100A, 100B, 121A, 121B, 122, 134; ARE 100A, 100B, 155, 156, 157**.

◦ 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 192 (Internship in Applied Math). Requires faculty advisor approval and 90 hours of internship. You must find internship; ICC can help.
- 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/>