Quarter-By-Quarter Graduation Plan

For the Applied Concentration: TENTATIVE for the 17/19 catalog

**Directions:** On the following page is a graduation plan template. Use the checklist on pages 3-7 of this handout to fill in the template with your own graduation plan. As you choose classes, pay attention to pre-requisites and make sure that the course you are interested in is actually offered in the quarter in which you plan to take it (this information can be found on the checklist). In the first row, list the courses you have already taken, courses you are currently taking, and courses covered by AP credit (if you need more space, use the second row as well). If you need more years, download another copy of the template. After you have worked out a plan, take it to your math department advisor and have them look it over with you and sign it (you should give yourself some time to do this since your advisor’s schedule and yours might not align immediately). Turn in your completed and signed graduation plan and checklist in class on 11/28.
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**Plan for future quarters**

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List courses already taken or currently taking and courses covered by AP credit.
Check list for the Applied Curriculum: TENTATIVE!

Use these sheets to ensure that you have fulfilled the requirements of the math major under the applied curriculum for the 17-19 catalog. This curriculum has been approved by the department but is still under review at the college level. In addition, information about prerequisites and by quarter offerings for other departments is tentative.

Core Courses: Every math major is required to take each of the following courses. Be sure to note the prerequisites (listed with each course) as well as the quarters in which the course is offered. All courses are 4 credits unless otherwise listed.

- □ 141 Calculus I (Summer, Fall, Winter, or Spring)
- □ 142 Calculus II (Summer, Fall, Winter, or Spring; after C− or better in 141)
- □ 143 Calculus III (Summer, Fall, Winter, or Spring; after C− or better in 142)
- □ 202 Orientation to Math Major (Fall or Spring; after 143) (1 unit)
- □ 206 Linear Algebra I (Summer, Fall, Winter, or Spring; after 143)
- □ 241 Calculus IV (Summer, Fall, Winter, or Spring; after 143)
- □ 248 Methods of Proof (Summer, Fall, Winter, or Spring; after 143)
- □ 306 Lin Algebra II (Fall, Winter, or Spring; after 206, 241, and 248 with C− or better)
- □ 336 Combinatorics (Fall or Winter; after 248 or Junior standing)
- □ 412 Analysis I (Fall or Winter; after 306)
- □ 459 Senior Seminar (Fall or Spring; after 306 and two other 300+ level courses in the major), or 460 Applied Senior Sem (recommended for applied concentration) (TBA, probably Fall or Spring; after 306, 344, and CPE 101 or Math 350), or 461 Senior Project I (2 units) and 462 Senior Project II (2 units)
- □ 481 Abstract Algebra I (Fall or Winter; after 306 or 341)
- □ CPE 101 Comp Sci I (Fall or Spring)
- □ Phys 141 (Summer, Fall, Winter, or Spring; after Math 141 with C− or better and during or after Math 142)
- □ Phys 132 (Summer, Fall, Winter, or Spring; after Phys 141), or 133 (Summer, Fall, Winter, or Spring; after Phys 141 and Math 142)
Applied Concentration Required Courses: Take each of the following courses. Be sure to note the prerequisites (listed with each course) as well as the quarters in which the course is offered.

- □ 304 Vector Calculus (Winter or Spring; after 206 and 241)
- □ 344 Linear Analysis II (Fall or Winter or Spring; after 206 and 242)
- □ 350 Math Software (Spring; after 206, 241 and CPE 101), or CPE 102 Comp Sci II (Fall, Winter, or Spring; after CPE 101 with C− or better and Math 141 with C− or better)
- □ 408 Complex Analysis I (Fall; after 242)
- □ 413 Analysis II (Winter; after 412)
- □ 416 Differential Equations II (Fall 18, 20 or Winter 18, 20; after 206 and 242), or 418 Partial Differential Equations (Fall or Spring; after 344, recommended Math 304)
- □ 451 Numerical Analysis I (Winter; after 206, 242, and CPE 101)
- □ Stat 301 (Fall or Winter; after Math 141), or Stat 305 (for 13-15 catalog was 325) (Fall or Winter; after Math 142 and CPE 101), or Stat 425 (Fall; after Math 241 and 248, recommended Stat 301 and 305)

Applied Concentration Tracks: Choose 12 units from one of the following two tracks. You may not choose classes used above. Be sure to note the prerequisites (listed with each course) as well as the quarters in which the course is offered.

Track A:

- □ 335 Graph Theory (Fall 2017 or Fall 2019; after 248 or Junior standing)
- □ 406 Linear Algebra III (Spring; after Math 306)
- □ 409 Complex Analysis II (Winter; after 408)
- □ 414 Analysis III (Spring; after 413)
- □ 416 Differential Equations II (Fall 18, 20 or Winter 18, 20; after 206 and 242)
- □ 418 Partial Differential Equations (Fall or Spring; after 344, recommended Math 304)
- □ 437 Game Theory (Spring; after 206 and 248 with C− or better)
- □ 452 Numerical Analysis II (Spring 2017 or Spring 2019; after 451)
- □ 453 Numerical Optimization (Spring 2018 or Spring 2020; after 306 and 451)
- □ 460 Applied Senior Sem (TBA, probably Fall or Spring; after 306, 344, and CPE 101 or Math 350; not open to students with credit in 459)
- □ 461 Senior Project I (2 units) and 462 Senior Project II (2 units)
- □ 476 Advanced Topics in Applied Mathematics (TBD; after 306 and consent of instructor)
Track B: (recommended for those pursuing the Data science minor)

- Data 301 (Winter; after CPE 102 and Stat 302)
- Data 401 (Fall; after CSC 365, CSC 466, DATA 301, Stat 331, and Stat 419)
- 335 Graph Theory (Fall 2017 or Fall 2019; after 248 or Junior standing, or
  453 Numerical Optimization (Spring 2018 or Spring 2020; after 306 and 451)

**Applied Concentration Advisor Approved Electives:** Choose at least 12 units
from one of the following categories, with at least once course at the 300-level or above. **You may not choose courses from multiple categories. You may not choose classes used above.** Be sure to note the prerequisites (listed with each course) as well as the quarters in which the course is offered.

**Astronomy and Physics:**

- Astr 301 The Solar System (Winter 18, 20 or 19; after Phys 132 and Math 141) (3 units)
- Astr 302 Stars and Galaxies (Spring; after Phys 132 and Math 141) (3 units)
- Astr 326 Cosmology (Fall 17, 18; after or during Physics 211) (3 units)
- 132 Physics II (Summer, Fall, Winter, or Spring; after Phys 141) (4 units)
- 133 Physics III (Summer, Fall, Winter, or Spring; after Phys 141 and Math 142, recommended Math 241) (4 units)
- 211 Modern Physics I (Fall, Winter, or Spring; after Phys 132, 133, and Math 241) (4 units)
- 301 Thermal Physics I (Winter; after Phys 211) (4 units)
- 302 Classical Mechanics I (Fall; after Phys 141 and Math 241 and Math 242) (4 units)
- 303 Classical Mechanics II (Winter; after Phys 302) (3 units)
- 317 Special Theory Relativity (Winter 18 or 20; after Phys 211) (3 units)
- 322 Vibrations/Waves (Fall; after Phys 132 and Math 242, recommended Math 344) (3 units)
- 323 Optics (Winter; after Phys 133, 322, and Math 241) (4 units)
- 405 Quantum Mechanics I (Spring; after Phys 212, 302, 322 and Math 241, 242, recommended Math 344) (4 units)
- 408 Electromagnetic Fields and Waves I (Fall; after Phys 133 and Math 304) (4 units)
- 412 Solid State Physics (Fall; after Phys 211 and Math 244 (instructor should be petitioned to accept Math 206 and 242 in lieu of 244)) (3 units)
- 417 Nonlinear Dynamical Systems (Spring 18 or 20; after Phys 132, 133, and Math 241, 242) (4 units)

(more on next page)
## Computer Science options:

- CPE 102 Comp Sci II (Fall, Winter, or Spring; after CPE 101 with C− or better and Math 141 with C− or better) (4 units)
- CPE 103 Comp Sci III (Fall, Winter, or Spring; after CPE 102 with C− or better) (4 units)
- CSC 225 Intro to Comp Organization (Fall, Winter, or Spring; after CPE 102) (4 units)
- CSC 349 Algorithms (Fall or Spring; after CPE 103 and Math 248) (4 units)
- CPE 357 Systems Programming (Fall, Winter, or Spring; after CPE 103 with C− or better, and CSC 225) (4 units)
- CPE 448 Bioinformatics Algorithms (Fall; after CSC 349) (4 units)

## Statistics options:

- 302 Stat II (Winter or Spring; after Stat 301)
- 305 Intro to Probability (for 13-15 catalog was 325) (Fall or Winter; after Math 142 and CPE 101)
- 323 Design and Analysis of Exp I (Winter or Spring; after Stat 302)
- 324 Applied Regression Analysis (Fall, Winter (not winter 17), or Spring; after Stat 302)
- 330 Stat Computing with SAS (Fall or Winter; after Stat 302)
- 331 Stat Computing with R (Fall or Spring; after Stat 302 and CPE 101 or Stat 330)
- 416 Stat Analysis of Time Series (Fall; after Stat 324)
- 417 Survival Analysis Methods (Winter; after Stat 302 and Math 142)
- 418 Analysis of Cross-Classified Data (Winter; after Stat 324)
- 419 Applied Multivariate Stat (Spring; after Stat 302 and Math 206)
- 421 Survey Sampling and Methodology (Fall; after Stat 302)
- 423 Design and Analysis of Experiments II (Spring; after Stat 323)
- 425 Probability Theory (Fall; after Math 241 and 248, recommended Stat 301, 305)
- 426 Est and Samp Theory (Winter; after Stat 425, recommended Stat 302)
- 427 Mathematical Stats (Spring; after Stat 426)

## Mechanical Engineering options:

- 211 Engineering Statics (Fall, or Winter or Spring; after Phys 141 or during or after Math 241) (3 units)
- 212 Engineering Dynamics (Fall, or Winter or Spring; after ME 211 and Math 241) (3 units)
- 302 Thermodynamics I (Fall, or Winter or Spring; after Phys 132 and ME 212) (3 units)
- 326 Intermediate Dynamics (Fall or Winter or Spring; after ME 212, CSC 231, or CSC 234 (instructor may accept CPE 101), and after or during Math 244 (instructor may accept Math 206 and 242)) (4 units)
- 341 Fluid Mechanics I (Fall, or Winter or Spring; after ME 212) (3 units)

(more on next page)
Economics options:

□ 311 Intermediate Microeconomics I (Fall, Winter, or Spring; after Econ 201 or Econ 221 and Econ 222, and Math 141) (4 units)

□ 312 Intermediate Microeconomics II (Fall, Winter, or Spring; after Econ 311) (4 units)

□ 313 Intermediate Macroeconomics (Fall, Winter, or Spring; after or during Econ 311) (4 units)

□ 403 Industrial Organization (Spring; after Econ 312) (4 units)

□ 408 Mathematical Economics (Winter; after Econ 313) (4 units)

□ 409 Probability Models for Economic Decisions (Fall; after Econ 312) (4 units)
General Education Requirements:
See http://www.ge.calpoly.edu/studentsandadvisors/allgecourses.html for a complete list of available courses along with the various requirements.

Area A: Communication
- □ A1 Engl 133/134
- □ A2 Coms 101/102
- □ A3 Reason, Arg & Writing

Area B: Science and Math
- □ B2 Life Science

Area C: Arts and Humanities
- □ C1 Literature
- □ C2 Philosophy: Phil 230/231
- □ C3 Fine/Perf Arts

Area D/E: Society and the Individual
- □ D1 American Exp
- □ D2 Political Economy
- □ D3 Comparative Social Inst
- □ D4 Self Development
- □ D5 Upper-division elective

Area F: Technology
- □ Upper division

General Free electives: You must have at least 180 units total to graduate with a Math Major from Cal Poly. For the General Curriculum, this requires 7 more units. These can consist of any Cal Poly courses, AP credits, or transfer credits which are not used above.

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