

DEPARTMENT OF MATHEMATICAL, PHYSICAL, AND ENGINEERING SCIENCES

Mission

The Department of Mathematical, Physical, and Engineering Sciences at Texas A&M University-San Antonio strives to provide a rich educational experience for STEM students through face-to-face instruction, on-line learning, and hybrid courses with small class sizes and state-of-the-art technology. We emphasize hands-on experiential learning and critical thinking, and the participation of undergraduate students in research under our faculty's mentorship. We strive to provide our students with leadership skills and values to prepare them for the work-place, for advanced study, and for an ever-changing world.

Contact Information

Dr. Mirley K. Balasubramanya
Department Chair
STEM 311G

Programs

- Biochemistry, Minor (<https://catalog.tamusa.edu/undergraduate/arts-sciences/mathematical-physical-engineering-sciences/biochemistry-minor/>)
- Chemistry with Teacher Certification, Bachelor of Science (<https://catalog.tamusa.edu/undergraduate/arts-sciences/mathematical-physical-engineering-sciences/chemistry-teacher-certification-bs/>)
- Chemistry, Bachelor of Arts (<https://catalog.tamusa.edu/undergraduate/arts-sciences/mathematical-physical-engineering-sciences/chemistry-ba/>)
- Chemistry, Bachelor of Science (<https://catalog.tamusa.edu/undergraduate/arts-sciences/mathematical-physical-engineering-sciences/chemistry-bs/>)
- Chemistry, Minor (<https://catalog.tamusa.edu/undergraduate/arts-sciences/mathematical-physical-engineering-sciences/chemistry-minor/>)
- Electronic Systems Engineering Technology, Bachelor of Science (<https://catalog.tamusa.edu/undergraduate/arts-sciences/mathematical-physical-engineering-sciences/electronic-systems-engineering-technology-bs/>)
- Mathematical Biology, Minor (<https://catalog.tamusa.edu/undergraduate/arts-sciences/mathematical-physical-engineering-sciences/mathematical-biology-minor/>)
- Mathematics with Teacher Certification, Bachelor of Science (<https://catalog.tamusa.edu/undergraduate/arts-sciences/mathematical-physical-engineering-sciences/mathematics-teacher-certification-bs/>)
- Mathematics, Bachelor of Arts (<https://catalog.tamusa.edu/undergraduate/arts-sciences/mathematical-physical-engineering-sciences/mathematics-ba/>)
- Mathematics, Bachelor of Science (<https://catalog.tamusa.edu/undergraduate/arts-sciences/mathematical-physical-engineering-sciences/mathematics-bs/>)
- Mathematics, Minor (<https://catalog.tamusa.edu/undergraduate/arts-sciences/mathematical-physical-engineering-sciences/mathematics-minor/>)

- Water Resources Science & Technology, Bachelor of Applied Arts and Sciences (<https://catalog.tamusa.edu/undergraduate/arts-sciences/mathematical-physical-engineering-sciences/water-resources-science-technology-baas/>)
- Water Resources Science & Technology, Bachelor of Science (<https://catalog.tamusa.edu/undergraduate/arts-sciences/mathematical-physical-engineering-sciences/water-resources-science-technology-bs/>)
- Water Resources Science and Technology, Minor (<https://catalog.tamusa.edu/undergraduate/arts-sciences/mathematical-physical-engineering-sciences/water-resources-science-technology-minor/>)

Courses Chemistry

| Code | Title | Credits |
|-----------|--------------------------------|---------|
| CHEM 1111 | General Chemistry Lab I | 1 |
| CHEM 1112 | General Chemistry Lab II | 1 |
| CHEM 1305 | Introductory Chemistry I | 3 |
| CHEM 1311 | General Chemistry I | 3 |
| CHEM 1312 | General Chemistry II | 3 |
| CHEM 2123 | Organic Chemistry I Lab | 1 |
| CHEM 2125 | Organic Chemistry II Lab | 1 |
| CHEM 2171 | Water & Wastewater Lab | 1 |
| CHEM 2314 | Selected Topics-Chemistry | 3 |
| CHEM 2323 | Organic Chemistry I | 3 |
| CHEM 2325 | Organic Chemistry II | 3 |
| CHEM 2371 | Water & Wastewater Chemistry | 3 |
| CHEM 3100 | Physical Chem for Life Sci Lab | 1 |
| CHEM 3131 | Quantitative Analysis Lab | 1 |
| CHEM 3156 | Topics in Chemistry Laboratory | 1 |
| CHEM 3300 | Physical Chem for Life Sci | 3 |
| CHEM 3304 | Research in Chemistry | 1-3 |
| CHEM 3315 | History of Chemistry/Study Abr | 3 |
| CHEM 3331 | Quantitative Analysis | 3 |
| CHEM 3350 | Advanced Organic Chemistry | 3 |
| CHEM 3365 | Internship in Chemistry | 1-3 |
| CHEM 3451 | Environmental Chemistry | 4 |
| CHEM 4131 | Instrumental Analysis Lab | 1 |
| CHEM 4101 | Physical Chemistry I Lab | 1 |
| CHEM 4102 | Physical Chemistry II Lab | 1 |
| CHEM 4141 | Biochemistry Laboratory | 1 |
| CHEM 4190 | Inorganic Chemistry Laboratory | 1 |
| CHEM 4301 | Physical Chemistry I | 3 |
| CHEM 4302 | Physical Chemistry II | 3 |
| CHEM 4329 | Selected Topics-Organic | 3 |
| CHEM 4331 | Instrumental Analysis | 3 |
| CHEM 4339 | Selected Topics-Analytical | 3 |
| CHEM 4341 | Biochemistry I | 3 |
| CHEM 4342 | Biochemistry II | 3 |
| CHEM 4349 | Selected Topics-Biochemistry | 3 |
| CHEM 4356 | Topics in Chemistry | 3 |
| CHEM 4359 | Selected Topics-Computational | 3 |

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| CHEM 4360 | Separation Science | 3 |
| CHEM 4370 | Enzymology | 3 |
| CHEM 4379 | Selected Topics-Environ/Toxic | 3 |
| CHEM 4390 | Inorganic Chemistry | 3 |
| CHEM 4420 | Computational Chemistry | 4 |

Electronic Systems Engineering Technology

| Code | Title | Credits |
|-----------|--------------------------------|---------|
| ESET 2101 | AC and DC Circuits Lab | 1 |
| ESET 2102 | Analog Circuits Lab | 1 |
| ESET 2301 | AC and DC Circuits | 3 |
| ESET 2302 | Analog Circuits | 3 |
| ESET 3101 | Digital Electronics Lab | 1 |
| ESET 3102 | Found of Wireless Commun I | 1 |
| ESET 3103 | Found of Wireless Commun II | 1 |
| ESET 3104 | Programmable Logic Controllers | 1 |
| ESET 3105 | Near and Far Field Commu Lab | 1 |
| ESET 3205 | Near and Far Field Communicati | 2 |
| ESET 3301 | Digital Electronics | 3 |
| ESET 3302 | Found of Wireless Commun I | 3 |
| ESET 3303 | Found of Wireless Commun II | 3 |
| ESET 3304 | Programmable Logic Controllers | 3 |
| ESET 4101 | Control Systems Lab | 1 |
| ESET 4102 | Electronics Testing Lab | 1 |
| ESET 4103 | Digital Hardware Design Lab | 1 |
| ESET 4105 | Sensors and Instrumentation La | 1 |
| ESET 4106 | Embedded & Connected Smart Dev | 1 |
| ESET 4107 | Electronic Design Smart Card | 1 |
| ESET 4108 | Unmanned Mobile Sys Architectu | 1 |
| ESET 4201 | Control Systems | 2 |
| ESET 4202 | Electronics Testing | 2 |
| ESET 4203 | Digital Hardware Design | 2 |
| ESET 4205 | Sensors and Instrumentation | 2 |
| ESET 4206 | Embedded & Connected Smart Dev | 2 |
| ESET 4207 | Electronic Design Smart Card | 2 |
| ESET 4208 | Unmanned Mobile Systems Archit | 2 |
| ESET 4304 | Electronic Systems Capstone Pr | 3 |

Engineering Technology

| Code | Title | Credits |
|-----------|--------------------------------|---------|
| ENTC 1301 | Principles of Engineering Tech | 3 |

Geography

| Code | Title | Credits |
|-----------|--------------------------------|---------|
| GEOG 1301 | Physical Geography Meteorology | 3 |
| GEOG 1302 | Cultural Geography | 3 |
| GEOG 1303 | World Geography | 3 |
| GEOG 2390 | Selected Topics: Geography | 3 |
| GEOG 3305 | Environmental Geography | 3 |

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| GEOG 3331 | United States and Canada | 3 |
| GEOG 4390 | Advanced Topics: Geography | 3 |

Geology

| Code | Title | Credits |
|-----------|--------------------------|---------|
| GEOL 1101 | Earth Sciences Lab I | 1 |
| GEOL 1102 | Earth Sciences Lab II | 1 |
| GEOL 1301 | Earth Sciences I | 3 |
| GEOL 1302 | Earth Sciences II | 3 |
| GEOL 2390 | Selected Topics: Geology | 3 |
| GEOL 4390 | Advanced Topics: Geology | 3 |

Mathematics

| Code | Title | Credits |
|-----------|--|---------|
| MATH 0114 | Mathematics Support Course for MATH 1314 | 1 |
| MATH 0124 | Mathematics Support Course for MATH 1324 | 1 |
| MATH 0132 | Mathematics Support Course for MATH 1332 | 1 |
| MATH 0142 | Mathematics Support Course for MATH 1342 | 1 |
| MATH 0314 | College Algebra: CoReq Lab | 3 |
| MATH 0324 | Math for Bus & Sci: CoReq Lab | 3 |
| MATH 0332 | Contemporary Math: CoReq Lab | 3 |
| MATH 0342 | Introductory Statistics: CoReq Lab | 3 |
| MATH 1014 | College Algebra Recitation | 0 |
| MATH 1024 | Math Bus/Soc Sci I Recitation | 0 |
| MATH 1025 | Math Bus/Soc Sci II Recitation | 0 |
| MATH 1042 | Intro Statistics Recitation | 0 |
| MATH 1314 | College Algebra | 3 |
| MATH 1316 | Trigonometry | 3 |
| MATH 1324 | Math for Bus/Soc Sci I | 3 |
| MATH 1325 | Math for Bus/Soc Sci II | 3 |
| MATH 1332 | Contemporary Mathematics I | 3 |
| MATH 1342 | Introductory Statistics | 3 |
| MATH 1350 | Fundamentals of Mathematics I | 3 |
| MATH 1351 | Fundamentals of Mathematics II | 3 |
| MATH 2113 | Calculus I Lab | 1 |
| MATH 2114 | Calculus II Lab | 1 |
| MATH 2190 | Topics in Mathematics | 1 |
| MATH 2290 | Topics in Mathematics | 2 |
| MATH 2312 | Pre-Calculus | 3 |
| MATH 2313 | Calculus I | 3 |
| MATH 2314 | Calculus II | 3 |
| MATH 2390 | Topics in Mathematics | 3 |
| MATH 2490 | Topics in Mathematics | 4 |
| MATH 3301 | Biostatistics | 3 |
| MATH 3320 | Differential Equations | 3 |
| MATH 3321 | Applied Partial Differential Equations | 3 |
| MATH 3325 | Intro to Mathematical Proofs | 3 |
| MATH 3340 | Linear Algebra with Appl | 3 |
| MATH 3350 | Probability & Stats for Tchrs | 3 |
| MATH 3360 | Modern Geometry | 3 |
| MATH 3370 | Discrete Mathematics | 3 |
| MATH 3371 | Problem Solving with Computers | 3 |

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|-----------|--------------------------------|-----|-----------|--|---|
| MATH 3372 | Mathematical Biology | 3 | WATR 4191 | Water Resources Science and Technology Seminar | 1 |
| MATH 3373 | Mathematical Physiology | 3 | WATR 4305 | US-Mex Borderlands Wtr Issues | 3 |
| MATH 3415 | Calculus III | 4 | WATR 4310 | Desalination and Emerging Technologies | 3 |
| MATH 4180 | Undergraduate Research in Math | 1 | WATR 4315 | Advanced Wastewater Recycling Systems | 3 |
| MATH 4190 | Advanced Topics in Mathematics | 1 | WATR 4330 | Water Management and Field Investigations | 3 |
| MATH 4280 | Undergraduate Research in Math | 2 | WATR 4340 | Environmental Impact Assessmen | 3 |
| MATH 4290 | Advanced Topics in Mathematics | 2 | WATR 4350 | Adv Topics in Water Sciences | 3 |
| MATH 4303 | Statistical Methods | 3 | | | |
| MATH 4321 | Real Variables | 3 | | | |
| MATH 4325 | Topology | 3 | | | |
| MATH 4330 | Number Theory | 3 | | | |
| MATH 4340 | Modern Algebra | 3 | | | |
| MATH 4341 | Linear Alg and Matrix Theory | 3 | | | |
| MATH 4350 | Probability | 3 | | | |
| MATH 4360 | Introduction to Graph Theory | 3 | | | |
| MATH 4370 | Vector Analysis | 3 | | | |
| MATH 4374 | Numerical Analysis | 3 | | | |
| MATH 4375 | Applied Complex Analysis | 3 | | | |
| MATH 4380 | Undergraduate Research in Math | 1-3 | | | |
| MATH 4390 | Advanced Topics in Mathematics | 3 | | | |
| MATH 4480 | Undergraduate Research in Math | 4 | | | |
| MATH 4490 | Advanced Topics in Mathematics | 4 | | | |

Physics

| Code | Title | Credits |
|-----------|---------------------------|---------|
| PHYS 1101 | General Physics Lab I | 1 |
| PHYS 1102 | General Physics Lab II | 1 |
| PHYS 1301 | General Physics I | 3 |
| PHYS 1302 | General Physics II | 3 |
| PHYS 2125 | University Physics Lab I | 1 |
| PHYS 2126 | University Physics Lab II | 1 |
| PHYS 2325 | University Physics I | 3 |
| PHYS 2326 | University Physics II | 3 |
| PHYS 2390 | Selected Topics-Physics | 3 |
| PHYS 4390 | Advanced Topics-Physics | 3 |

Water Resources Science and Technology

| Code | Title | Credits |
|-----------|---|---------|
| WATR 1301 | Introduction to Water Treatment | 3 |
| WATR 1302 | Introduction to Wastewater Treatment | 3 |
| WATR 2350 | Topics in Water Resources | 3 |
| WATR 3312 | Water Laws, Rules & Policy | 3 |
| WATR 3315 | Inst & Role in Wtr Resrce Mgmt | 3 |
| WATR 3317 | Water Sust Use & Conserv Polcy | 3 |
| WATR 3320 | Pollutants in Environmental System | 3 |
| WATR 3321 | Water Policy Institution Inter | 3 |
| WATR 3325 | Aquatic System Science | 3 |
| WATR 3330 | Green Systems for Wastewater Management | 3 |
| WATR 3331 | Hydrology | 3 |
| WATR 3340 | Water Resources Science and Technology Internship | 3 |
| WATR 4181 | Research | 1 |