

## B.S in Mathematics - Applied Math Emphasis 2021-22

|  | Course             | Title                            | Cr. | When      | Prerequisites                               |
|--|--------------------|----------------------------------|-----|-----------|---|
| Required GE Courses  | Quantitative Lit.  | Math 1210 - Calculus I *         | 4   | F/S/SU    | Math 1050 & 1060 or ACT 26+                 |
|  | Ph. Sci. Option 1  | CHEM 1210/15, Chem 1/Lab         | 5   | F/S/SU    | Math 1050, 1210, or ACT 26+                 |
|  | Ph. Sci. Option 2  | PHYS 2210/15, Physics 1/Lab      | 5   | F/S/SU    | Math 1210                                   |
| Other GE courses are required to graduate with a Bachelor's Degree from SUU. The above-listed courses count for both GE and Major Requirements |                    |                                  |     |           |   |
| Math Common Core   | CS 1400            | Fundamentals of Programming      | 3   | F/S       | CSIS 1030 or MATH 1050 (within 4 Years)     |
|  | CS 1410            | Object Oriented Programming      | 3   | F/S/SU    | CS 1400                                     |
|  | MATH 1220          | Calculus II                      | 4   | F/S/SU    | MATH 1210                                   |
|  | MATH 2210          | Calculus III                     | 4   | F/S/SU    | MATH 1220                                   |
|  | MATH 2270          | Linear Algebra                   | 3   | F/S/SU    | MATH 1220                                   |
|  | MATH 3120          | Transition to Advanced Math      | 3   | F/S       | MATH 1220 & 2270                            |
|  | MATH 3250          | Complex Variables                | 3   | S-ODD     | MATH 2210                                   |
|  | MATH 3600          | Numerical Analysis               | 3   | S-EVEN    | MATH 2250 or 2280 and programming knowledge |
|  | MATH 3700          | Probability and Statistics       | 4   | F/S/SU    | MATH 1220                                   |
| Diff. Eq. Option   | MATH 4400          | Advanced Calculus I              | 3   | F         | MATH 2210 & 3120                            |
|  | MATH 2250          | Lin. Alg. and Diff. Equations    | 4   | F/S       | MATH 1220                                   |
| Support Courses (Choose 1)   | MATH 2280          | Differential Equations           | 3   | S         | Math 1220 & 2270 (2270 concurrent)          |
|  | CHEM 1220/25       | Principles of Chemistry II/Lab   | 4/1 | F/S/SU    | CHEM 1210/15                                |
| Emphasis Elective Credits (12 Credits Required)  | PHYS 2220/25       | Physics II/Lab                   | 4/1 | F/S/SU    | PHYS 2210/15 & MATH 1220                    |
|  | CHEM 3610/15       | Physical Chemistry I/Lab         | 3/1 | F         | Chem 1220/25 & Math 1220                    |
|  | CHEM 3620/25       | Physical Chemistry II/Lab        | 3/1 | S         | CHEM 3610/15                                |
|  | CS 2420            | Intro to Algs. & Data Structures | 3   | F/S/SU    | CS 1410                                     |
|  | CS 3550            | Found. of Computation Theory     | 3   | S         | CS 2300                                     |
|  | ENGR 2250/55       | Electric Circuits/Lab            | 3/1 | F/S/SU    | MATH 2250**, PHYS 2220/25, ENGL 2010        |
|  | ENGR 3000          | Thermodynamics                   | 3   | F         | PHYS 2220                                   |
|  | ENGR 3050/55       | Fluid Mechanics/Lab              | 3/1 | S/SU      | MATH 1220 & PHYS 2210                       |
|  | ENGR 4010          | Heat Transfer                    | 3   | F         | ENGR 3050/55 & MATH 2250**                  |
|  | ENGR 4300          | Vibrations                       | 3   | F         | ENGR 2030, 2140, 2170 & MATH 2250 or 2280   |
|  | MATH 3770          | Mathematical Modeling            | 3   | S-ODD     | MATH 3700                                   |
|  | MATH 3800          | Partial Differential Equations   | 3   | F-ODD     | MATH 2210 & MATH 2250 or 2280               |
|  | MATH 4220          | Abstract Algebra I               | 3   | F         | MATH 3120                                   |
|  | MATH 4410          | Advanced Calculus II             | 3   | S-ODD     | MATH 4400                                   |
|  | PHYS 3310          | Quantum Physics I                | 3   | F         | PHYS 2210/15 & PHYS 2220/25                 |
| PHYS 3320  | Quantum Physics II | 3                                | S   | PHYS 3310 |   |

**Additional Degree Requirements:** To complete a Bachelor's Degree at SUU, students must have a total of 40 upper-division credits. Applied Math majors

may need up to 14 additional upper-division electives outside of their major requirements. They may also need as many as 35 elective credits to meet the 120 credit degree requirement.

The Math Department highly recommends that those seeking an Applied Math degree seek a minor in Chemistry, Computer Science, or Physics. Information on each of those minors is included in the tables on the following page.

| <b>Minor in Chemistry</b>             |              |                                   |     |        |   |
|---------------------------------------|--------------|-----------------------------------|-----|--------|---|
|                                       | Course       | Title                             | Cr. | Sched. | Prerequisites/Notes                     |
| Required Courses                      | CHEM 1210/15 | Principles of Chemistry I/Lab     | 4/1 | F/S/SU | MATH 1050, MATH 1210, or ACT 26         |
|                                       | CHEM 1220/15 | Principles of Chemistry II/Lab    | 4/1 | F/S/SU | CHEM 1210/15                            |
| Chemistry Option 1                    | CHEM 2310/15 | Organic Chemistry I/Lab           | 4/1 | F/S/SU | CHEM 1220/25                            |
|                                       | CHEM 2320/25 | Organic Chemistry II/Lab          | 4/1 | F/S/SU | CHEM 2310/15                            |
| Chemistry Option 2                    | CHEM 3610/15 | Physical Chemistry I/Lab          | 3/1 | F      | CHEM 1220/25 & MATH 1220                |
|                                       | CHEM 3620/25 | Physical Chemistry II/Lab         | 3/1 | S      | CHEM 3610/15                            |
| Chemistry Option 3                    | CHEM 4110    | Biochemistry I                    | 4   | F      | CHEM 2320/25                            |
|                                       | CHEM 4120/25 | Biochemistry II/Lab               | 4/1 | S      | CHEM 4110                               |
| <b>Minor in Computer Science</b>      |              |                                   |     |        |   |
|                                       | Course       | Title                             | Cr. | Sched. | Prerequisites/Notes                     |
| Required Courses                      | CS 1400      | Fundamentals of Programming       | 3   | F/S    | CSIS 1030 or MATH 1050 (within 4 years) |
|                                       | CS 1410      | Object Oriented Programming       | 3   | F/S/SU | CS 1400                                 |
|                                       | CS 2420      | Intro to Alg's & Data Structures  | 3   | F/S/SU | CS 1410                                 |
| Elective Courses (9 credits required) | CS 2450      | Software Engineering              | 3   | F      | CHEM 1220/25                            |
|                                       | CS 3150      | C and C++ Programming             | 3   | F      | CS 2420                                 |
|                                       | CS 3300      | Mobile App Develop. Android       | 3   | S-ODD  | CS 2420                                 |
|                                       | CS 3550      | Found. of Computation Theory      | 3   | S      | CS 2300 or MATH 3120                    |
|                                       | CS 3600      | Operating Systems                 | 3   | S      | CS 2420                                 |
|                                       | CS 4300      | Mobile App Develop. iOS           | 3   | S-EVEN | CS 2420                                 |
|                                       | CS 4350      | Web Programming                   | 3   | F-ODD  | CS 2420                                 |
|                                       | CSIS 3700    | Introduction to Digital Forensics | 3   | F      | IS 2600 or instructor permission        |
|                                       | CSIS 4540    | Human-Computer Interfaces         | 3   | S-ODD  | CS 2420                                 |
|                                       | CSIS 4700    | Internet Forensics & Cyber Sec    | 3   | S      | CSIS 3700 or instructor permission      |
|                                       | EET 2780     | Digital Electronics I             | 3   | F/SU   | MATH 1050 or higher                     |
| <b>Minor in Physics</b>               |              |                                   |     |        |   |
|                                       | Course       | Title                             | Cr. | Sched. | Prerequisites/Notes                     |
| Required Courses (20 credits)         | MATH 1210    | Calculus I                        | 4   | F/S/SU | Math 1050 & 1060 or ACT 26+             |
|                                       | MATH 1220    | Calculus II                       | 4   | F/S/SU | MATH 1210                               |
|                                       | MATH 2250    | Lin. Alg. and Diff. Equations     | 4   | F/S    | MATH 1220                               |
|                                       | PHYS 2210/15 | Physics for Sci./Engr. I/Lab      | 4/1 | F/S/SU | MATH 1210                               |
|                                       | PHYS 2220/25 | Physics for Sci./Engr. II/Lab     | 4/1 | F/S/SU | PHYS 2210/15 & MATH 1220                |
|                                       | PHYS 3310    | Quantum Physics I                 | 3   | F      | PHYS 2210/15 & 2220/25                  |
|                                       | PHYS 3320    | Quantum Physics II                | 3   | S      | PHYS 3310                               |
| Electives (4 credits)                 | EE 2250/55   | Electric Circuits/Lab             | 3/1 | F/S/SU | MATH 2250**, PHYS 2220/25, ENGL 2010    |
|                                       | CHEM 3610/15 | Physical Chemistry I/Lab          | 3/1 | F      | CHEM 1220/25 & MATH 1220                |
|                                       | CHEM 3620/25 | Physical Chemistry II/Lab         | 3/1 | S      | CHEM 3610/15                            |

\* If not Calculus-ready, students must take MATH 1050 and MATH 1060 before taking MATH 1210.

If not Calculus ready, students must take MATH 1000 and MATH 1000 before taking MATH 1210.

\*\* MATH 2270 and 2280 can be substituted for MATH 2250.

Indicates the course will be taught As Needed; work with the designated Department for scheduling.

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