WEBER STATE UNIVERSITY

COMPUTATIONAL STATISTICS AND DATA SCIENCE MAJOR

Program Prerequisite	Not required for Computational Statistics and Data Science major.
Advisement and Admission Requirements	There are no special admission or application requirements for the Regular, Applied Mathematics, or Computational Statistics and Data Science programs. All Mathematics majors should see the department advisor. They should meet at least once a year to help plan their programs and check on their progress.
Grade Requirement	A grade of "C" or better in courses required for this major ("C-" is not acceptable), in addition to an overall 2.0 GPA and a 2.0 GPA in mathematics classes numbered 1210 or above.
Credit Hour Requirements	A Total of 120 credit hours are required for graduation. A total of 40 upper division credit hours are required (courses numbered 3000 and above); at least nine credit hours of upper division mathematics must be completed at WSU.
Minor Requirement	No minor required.

Major Course Requirements for Computational Statistics and Data Science BS Degree

MATHEMATICS AND COMPUTER SCIENCE REQUIRED COURSES (48 credit hours)

- **CS 1400** Fundamentals of Programming (4) Su, F, Sp Prerequisite: CS 1030 or NET 1300
- **CS 1410** Object-Oriented Programming (4) Su, F, Sp Prerequisite: CS 1400 and [ENGL 1010 or ENGL 2020]
- **CS 2420** Intro to Data Structures and Algorithms (4) Su, F, Sp Prerequisite: CS 1410 and coreq (MATH 1080 or [1050 and 1060])
- **CS 2550** Intro to Database Design and SQL (4) Su, F, Sp Prerequisite: CS 1030 or NET 1300
- **CS 3580** Data Science Algorithms (4) Sp Prerequisite: MATH 1040 or QUAN 2600
- **MATH 1210** Calculus I (4) Su, F, Sp Prerequisite: [MATH 1050 and 1060] or MATH 1080
- **MATH 1220** Calculus II (4) Su, F, Sp Prerequisite: MATH 1210
- **MATH 2210** Calculus III (4) Su, F, Sp Prerequisite: MATH 1220
- **MATH 2270** Elementary Linear Algebra (3) F, Sp Prerequisite: (MATH 1210 and [MATH 3110 or 3160]) or MATH 1220
- **MATH 3410** Probability and Statistics I (3) F Prerequisite: MATH 1220
- **MATH 3420** Probability and Statistics II (3) Sp Prerequisite: MATH 3410
- **MATH 3450** Advanced Statistical Methods (4) Sp Prerequisite: [MATH 1040 or MATH 3410] and [any upper division 3 credit course designated $\geq$ 3000 BTNY, CHEM, CS, ECE, ECON, EE, FIN, GEO, MATH, MICR, ME, PHYS, ZOOL] or instructor approval
- **MATH 4400** Statistical Analysis of Big and Small Data (3) Prerequisite: ([MATH 1040 and 1220] or [MATH 3410]) and corequisite [CS 1400 or 2550] or instructor approval

STATISTICAL CONCEPTS ELECTIVES (at least 3 credit hours)

- MATH 1040 Introduction to Statistics (3) Su, F, Sp Prerequisite: MATH 1010
- PSY 3600 Statistics in Psychology (3) Su, F, Sp Prerequisite: QL
- QUAN 2600 Business Statistics I (3) Su, F, Sp Prerequisite: MATH 1050 or 1080 or 1210
- SOC 3600 Social Statistics (3) Su, F, Sp Prerequisite: MATH 1010

BUSINESS COMMUNICATION ELECTIVES (at least 3 credit hours)

- ***COMM 1020 (HU)** Principles of Public Speaking (3) Su, F, Sp
- ***COMM 2110 (HU)** Interpersonal Small Group Communication (3) Su, F, Sp
- MKTG 3010 Marketing Concepts and Practices (3) Su, F, Sp
- PS 3250 Business Communication (3) Su, F, Sp Prerequisite: ENGL 2010

*General education course

WEBER STATE UNIVERSITY MATHEMATICS DEPARTMENT

MATH AND COMPUTING ELECTIVES (at least 6 credit hours)

- **CS 2130** Computational Structures (4) Su, F, Sp Prerequisite: CS 1400
- **CS 3550** Advanced Database Programming (4) Su, F, Sp Prerequisite: CS 2250
- **CS 6600** Machine Learning (4) offered as needed Prerequisite: CS 2420
- **MATH 2280** Ordinary Differential Equations (3) F, Sp Prerequisite: MATH 1220
- **MATH 3550** Math Modeling (3) F even years Prerequisite: [MATH 1200 and 1220] and coreq [MATH 2270 or 2280]
- **MATH 3610** Graph Theory (3) F odd years Prerequisite: (MATH 1210 and [MATH 3110 or 3160]) or MATH 1220
- **MATH 3620** Enumeration (3) Sp even years Prerequisite: (MATH 1210 and [MATH 3110 or 3160]) or MATH 1220
- **MATH 4160** Cryptography (3) offered as needed Prerequisite: CS 1400 and [MATH 3110 or 3160 or 4110]
- **MATH 4210** Introductory Real Analysis I (3) F Prerequisite: MATH 2210 and 2270 and 3110
- **MATH 4220** Introductory Real Analysis II (3) Sp even years Prerequisite: MATH 4210
- **MATH 4610** Numerical Analysis I (3) F even years Prerequisite: MATH 2270
- **MATH 4620** Numerical Analysis II (3) Sp odd years Prerequisite: MATH 4610

OTHER ELECTIVES (**at least 9 credit hours** - choose from BUSINESS PRINCIPLES, HEALTH STATISTICS, COMPUTING, SCIENCE AND MAPPING or department approved alternate elective courses.)

BUSINESS PRINCIPLES

- **ACTG 2010** Survey of Accounting I (3) Su, F, Sp
- **ACTG 2020** Survey of Accounting II (3) Su, F, Sp Prerequisite: ACTG 2010
- **ACTG 3110** Intermediate Financial Accounting (3) Su, F, Sp Prerequisite ACTG 2020
- **ART 2430** Introduction to Graphic Design (3) F, Sp Corequisite: ART 1120
- **BSAD 1010** Introduction to Business (3) F, Sp
- ***ECON 2010 (SS)** Microeconomics (3) Su, F, Sp Prerequisite: MATH 1050 or 1080 or 1210
- ***ECON 2020 (SS)** Macroeconomics (3) Su, F, Sp Prerequisite: ECON 2010 and MATH 1050, 1080, or 1210
- **ECON 4550** Introduction to Econometrics (3) F Prerequisite: ECON 2010, ECON 2020, QUAN 2400, and QUAN 3610
- **MGMT 3010** Organization Behavior and Management (3) Su, F, Sp
- **MKTG 3100** Consumer Behavior (3) F, Sp Prerequisite: MKTG 3010
- **MKTG 3200** Selling and Sales (3) F, Sp Prerequisite: MKTG 3010
- **QUAN 3610** Business Statistics II (3) Su, F, Sp Prerequisite: QUAN 2600
- **SCM 3050** Operations and Supply Chain Management (3) Su, F, Sp Prerequisite: QUAN 2600

COMPUTING

- **^CS 1030** Foundations of Computing (4) Su, F, Sp
- **CS 2450** Software Engineering I (4) Su, F, Sp Prerequisite: CS 1410
- **CS 2705** Network Fundamentals/Design (4) Su, F, Sp Prerequisite: CS 1030 and CS 1400
- **CS 2810** Computer Arch/Organization (4) Su, F, Sp Prerequisite: CS 1410 or [CS 1400 and NET 3200]
- **MIS 2010** Business Computer Skills (1) Su, F, Sp
- **MIS 2110** Software Development I (3) F, Sp Prerequisite: MATH 1050
- **MIS 3210** Database Design/Implementation (3) F, Sp Prerequisite: MATH 1050 and [MIS 2110 or MIS 2020]

^ (CS 1030 Foundations of Computing is recommended to apply for an Institutional Certificate of Proficiency in Programming Essentials provided student has completed CS 1030, CS 1400, CS 1410, and CS 2420.)

HEALTH STATISTICS

- **HIM 3200** Epidemiology & Biostatistics (3) Su, F, Sp Prerequisite: QL
- **HIM 3210** Advanced Epidemiology & Population Health (3) F, Sp Prerequisite: HIM 3200
- **HIM 3300** Introduction to Quality Improved Health Care (3) Su, F, Sp
- **HIM 3500** Biomedical Research Support (2) F
- **HIM 3550** Health Care Data Analytics (3) F, Sp. Prerequisite: HIM 3500 and coreq HIM 3200

SCIENCE AND MAPPING

- **GEO 4210** Intro to Computer Mapping GIS (4) F Prerequisite: MATH 1040 and proficiency in Windows OS
- **GEO 4220** Technical and Applicational Issues in GIS (4) Sp Prerequisite: GEO 4210
- **GEOG 3450** Introduction to Cartography and GIS (3) F, Sp
- ***PHYS 2210 (PS)** Physics for Scientists and Engineers (5) F, Sp Corequisite: MATH 1210
- **PHYS 2300** Scientific Computing (3) F Prerequisite: PHYS 2210, MATH 1210, and [MATH 1200 or CS 1030]

ALTERNATE ELECTIVES **9 elective credits upon approval from Department of Mathematics.** These courses are typically, but not limited to 3000 or 4000 level courses, in the College of Science, College of Engineering, Applied Science and Technology, or Goddard School of Business and Economics.