Future Rivers Approved Data Science Courses

**Programming/Software Development for Data Science**
- AMATH 583: High Performance Scientific Computing (5 credits)
- ChemE 546: Software Engineering for Molecular Data Scientists (3 credits)
- CSE 583: Software Development for Data Scientists (4 credits)
- CS SS 508: Introduction to R for Social Scientists (1 credit)
- ESS 520: Application in Geophysical Analysis with Python for Earth Sciences (4 credits)
- FISH 497/549: Introduction to Environmental Data Science (3 credits)
- FISH 552: Introduction to R Programming for Natural Scientists (2 credits)
- FISH 553: Advanced R Programming for Natural Scientists (2 credits)
- ME 574: Introduction to Applied Parallel Computing for Engineers (3 credits)
- SMEA 580: Intro to coding in R (3 credits)

**Advanced Statistics and/or Statistical Modeling**
- AMATH 515: Fundamentals of Optimization (5 credits)
- AMATH 563: Inferring Structure of Complex Systems (5 credits)
- AMATH 582: Computational Methods for Data Analysis (5 credits)
- ATM S 552: Objective Analysis (3 credits)
- ATM S 559: Climate Modeling (3 credits)
- ATM S 565: Atmospheric Chemistry Modeling (3 credits)
- ATM S 582: Advanced Numerical Modeling of Geophysical Flows (3 credits)
- CEE 465: Data Analysis in Water Sciences (4 credits)
- CET 521: Inferential Data Analysis for Engineers (3 credits)
- CEWA 599: Geospatial Data Analysis (1-5 credits)
- CSE 546: Machine Learning (4 credits)
- CSE 599: Deep Reinforcement Learning (special topics 1-5 credits)
- FISH 458: Advanced Ecological Modeling (5 credits)
- FISH 507: Applied Time Series Analysis (4 credits)
- FISH 556: Spatio-temporal Models for Ecologists (5 credits)
- FISH 560: Applied Multivariate Statistics for Ecologists (5 credits)
- FISH 576/577 Applied Stock Assessment (4-5 credit)
- GEOG 526: Advanced Quantitative Methods in Geography (5 credits)
- Genome 559: Introduction to Statistical and Computational Genomics
- HCDE 411/511: Information Visualization/Data Visualization and Exploratory Analytics (4 credits)
- ME/EE 578: Convex Optimization (3 credits)
- ME 599: Machine Learning Control (special topics 1-5 credits)
- QERM 514: Analysis of Ecological and Environmental Data I (4 credits)
- QSCI/ESRM 451: Analytical Methods in Wildlife Science (3 credits)
- SEFS 540: Optimization Techniques for Natural Resources (5 credits)
- SEFS 590: Bayesian Modeling for Ecologists (1-5 credits)
- STAT/CSE 416: Introduction to Machine Learning (4 credits)
- STAT 435: Introduction to Statistical Machine Learning (4 credits)
- STAT 509: Introduction to Mathematical Statistics: Econometrics I (5 credits)
- STAT 512-513: Statistical Inference (4 credits each)
- STAT 535: Statistical Learning: Modeling, Prediction, and Computing (3 credits)
Data Management and/or Data Visualization

- **CEWA 565**: Data Analysis in Water Science (4 credits)
- **CSE 412**: Introduction to Data Visualization (4 credits)
- **CSE 414**: Introduction to Database Systems (4 credits)
- **CSE 442/512**: Data Visualization (4 credits)
- **CSE 544**: Principles of DBMS (4 credits)
- **ENVH 590**: Special Topics: Scientific Programming, Modeling, and Data Visualization with Environmental Health Applications
- **FISH 546**: Bioinformatics for Environmental Sciences (3 credits)
- **FISH 554**: Beautiful Graphics in R (2 credits)
- **HCDE 411/511**: Information for Visualization (4 credits)
- **INFX 562**: Interactive Information Visualization (4 credits)
- **INFO474**: Interactive Information Visualization (5 credits)
- **OCEAN 502**: Marine Geospatial Information Science (3 credits)
- **SEFS 520**: Geographic Information Systems in Forest Resources (5 credits)
- **SEFS 532/ CEE 432**: Advanced Remote Sensing (4 credits)