BCB 555. Bioalgorithms. 3 Credits.
Bioinformatics algorithms. Topics include DNA restriction mapping, clustering and evolution, tree construction, Hidden Markov Models, finding regulatory motifs, genome rearrangements, sequence alignments, gene prediction, graph algorithms, DNA sequencing, protein sequencing, combinatorial pattern matching, approximate pattern matching, approximate pattern matching, approximate pattern matching, approximate pattern matching, approximate pattern matching, approximate pattern matching, approximate pattern matching, approximate pattern matching, approximate pattern matching, approximate pattern matching, approximate pattern matching, approximate pattern matching, approximate pattern matching, approximate pattern matching, approximate pattern matching, approximate pattern matching, approximate pattern matching, approximate pattern matching, approximate pattern matching, approximate pattern matching, approximate pattern matching, approximate pattern matching, approximate pattern matching, approximate pattern matching, 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BCB 725. Introduction to Statistical Genetics. 3 Credits.
Covers statistical methods for the analysis of family and population-based genetic data. Topics include classical linkage analysis, population-based and family-based association analysis, haplotype analysis, genome-wide association studies, basic principles in population genetics, imputation-based analysis, pathway-based analysis, admixture mapping, analysis of copy number variations, and analysis of massively parallel sequencing data.

Rules & Requirements
Grading Status: Letter grade.

BCB 730. Fundamentals of Quantitative Image Analysis for Light Microscopy. 1 Credits.
This course is a practical introduction to quantitative analysis of light microscopy images. During the class students will follow tutorials that will guide them through common tasks in analysis of biological images. They will be introduced to basic concepts of image processing like image registration, filtering, object detection etc.

Rules & Requirements
Grading Status: Letter grade.

BCB 784. Introduction to Computational Biology. 3 Credits.
Molecular biology, sequence alignment, sequence motifs identification by Monte Carlo Bayesian approaches, dynamic programming, hidden Markov models, computational algorithms, statistical software, high-throughput sequencing data and its application in computational biology.

Rules & Requirements
Requisites: Prerequisites, BIOS 661 and 663; Permission of the instructor for students lacking the prerequisites.
Grading Status: Letter grade.
Same as: BIOS 784.

BCB 785. Statistical Methods for Gene Expression Analysis. 3 Credits.
Clustering algorithms, classification techniques, statistical techniques for analyzing multivariate data, analysis of high dimensional data, parametric and semiparametric models for DNA microarray data, measurement error models, Bayesian methods, statistical software, sample size determination in microarray studies, applications to cancer.

Rules & Requirements
Requisites: Prerequisites, BIOS 661 or 663, and 663; Permission of the instructor for students lacking the prerequisites.
Grading Status: Letter grade.
Same as: BIOS 785.

BCB 850. Training in Bioinformatics and Computational Biology Teaching. 3 Credits.
Principles of bioinformatic and computational biology pedagogy. Students are responsible for assistance in teaching BCB and work under the supervision of the faculty, with whom they have regular discussion of methods, content, and evaluation of performance.

Rules & Requirements
Repeat Rules: May be repeated for credit.
Grading Status: Letter grade.

BCB 870. Writing Fellowship Proposals. 1 Credits.
Provides practical experience to predoctoral students in writing fellowship proposals, using the NIH F31 as a template. Students will have weekly writing assignments, with feedback given by students and faculty. Open to 2nd and 3rd year students in the Curriculum or by permission of the instructor.

Rules & Requirements
Grading Status: Letter grade.
Same as: GNET 870.

BCB 888. Responsible Conduct of Research. 1 Credits.
Classroom-based graduate level course covering critical topics for ethical and responsible conduct of experimental research. There are both classroom lecture, workshop-type discussion components, in addition to assigned outside of class readings. Case studies and hypothetical situations involving the most likely scenarios confronting graduate students will be covered, these topics include: mentor and mentee relationships, publication authorship, collaboration, peer review, conflicts of interest, intellectual property, plagiarism, data acquisition and data processing. Restricted to students in good standing as a graduate student at UNC; In the unlikely event that classroom space is limited, preference will be given to graduate students who have previously received external federal funding sources and may require a refresher course in RCR.

Rules & Requirements
Repeat Rules: May be repeated for credit. 2 total credits. 1 total completions.
Grading Status: Letter grade.
Same as: BIOC 888.

BCB 891. Special Topics. 1-3 Credits.
Advance topics in current research in statistics and operations research.

Rules & Requirements
Repeat Rules: May be repeated for credit; may be repeated in the same term for different topics.
Grading Status: Letter grade.
Same as: MATH 891, GNET 891.

BCB 899. Special Topics in Bioinformatics and Computational Biology. 1-6 Credits.
Special topics course in the Bioinformatics and Computational Biology Curriculum. Topics will vary.

Rules & Requirements
Repeat Rules: May be repeated for credit. 9 total credits. 9 total completions.
Grading Status: Letter grade.

BCB 905. Research in Bioinformatics and Computational Biology. 1-8 Credits.
Credit awarded to students for research in bioinformatics and computational biology.

Rules & Requirements
Repeat Rules: May be repeated for credit.
Grading Status: Letter grade.

BCB 993. Master's Research and Thesis. 3 Credits.
Students are not accepted for master's program.

Rules & Requirements
Repeat Rules: May be repeated for credit.
BCB 994. Doctoral Research and Dissertation. 3 Credits.
Credit for work done towards doctorate.

Rules & Requirements
Repeat Rules: May be repeated for credit.