

## Translational Bioinformatics (TBI) Curriculum - MS 36 hours

### Biomedical Informatics Core: .....(12 hours)

BMIG 5011 Introduction to Biomedical Informatics I and lab (4 hours)

BMIG 5012 Introduction to Biomedical Informatics II and lab (4 hours)

BMIG 5010 Project Rotation in Biomedical Informatics (2 hours)\*

\*two rotations required for the core for a total of 4 credit hours

### Background necessary for research area .....(6 hrs MS)

Translational Bioinformatics students need foundational courses in both the biological and computational sciences. Necessary topics differ according to the research area and student's background. Examples are listed below.

#### (1) Biological sciences

NRDS 5111 Cell Biology, MBIM 6104 Molecular Cell Biology, PHYO 5013 Physiology, NBDS 5093 Cell Biology, BIOC 6102 Special Topics in Biochemistry: Genetics of Human Diseases, BIOC 5101 Biochemistry and Molecular Biology, MBIM 5003 Immunology, MBIM 5023 Microbiology, PHYO 5112 Gene Expression, PATH 5043 Molecular and Biochemical Pathobiology

#### (2) Computational sciences

BIOS 5013 Biostatistics I, BIOS 5212 Biostatistics II, PBHL 5101/5201 Biostatistics I and II Lab Using R, BMIG 5114 Bioconductor for Genomic Scale Data, IFSC 7320 Database Systems and Information Architecture, IFSC 7370 Big Data (includes no-SQL Databases), Python or PERL programming courses

### Specialty Track Course Options: .....(MS 6 hrs)

BMIG 5210 Genomics and Meta Genomics (3 hours)

BINF 5445 Theory and Applications in Bioinformatics<sup>UALR</sup> (3 hours)

PHSC 5143 Molecular Modeling (3 hours)

CPSC 5300 Machine Learning<sup>UALR</sup> (3 hours)

PBHL 9163 Genomics/Genetic Epidemiology (3 hours)

BMIG 6111 Comparative Microbial Genomics (3 hours)

MIBM 5904 Bacterial Genetics and Pathogenesis (4 hours)

IFSC 5345 Information Visualization<sup>UALR</sup> (3 hours)

BMIG 5211 Scientific Data visualization (3 hours)

BIOC 6102 Special Topics in Biochemistry: Proteomics (Varies)

BIOM 5108 Special Topics (3 hours)

BMIG 5016 Clinical and Translational Research (1 hour)

BMIG 5015 Introduction to Biological Network Analysis (1 hour)

### Research Methods and Conduct: .....(MS 9 hours)

BMIG 6050 Research Design (3 hours)

PCOL 5211 – 5241 Scientific Communication and Ethics (MS 0, PhD 4 semesters, 1 credit hour each)

BMIG 5800 Thesis (6 hours MS)

BMIG 6800 Dissertation research ( $\geq$  18 hours PhD)

BMIG 6215 Research (0 hours MS, variable hours PhD)

BIOM 5190 Research and Application Seminar (0 hour MS, 3 hours PhD)

### Free Electives: .....(MS 3 hours)

Chosen based on need to support master's or doctoral research.