

## Curriculum List (Undergraduate program)

| Classification  | Course No. | Computer Code | Course Name  | Lecture;Lab.; Credit (Assignment) | Semester    | Note   |
|-----------------|------------|---------------|--|-----------------------------------|-------------|--------|
| Mandatory Major | BiS200     | 41.200        | Bioengineering Fundamentals                        | 3:0:3(6)                          | Spring      |        |
|                 | BiS222     | 41.222        | Molecular & Cellular Biology                       | 3:0:3(6)                          | Fall        |        |
|                 | BiS301     | 41.301        | Bioengineering Laboratory I                        | 1:9:4(4)                          | Spring      |        |
|                 | BiS350     | 41.350        | Bioengineering Laboratory II                       | 1:9:4(4)                          | Fall        |        |
| Major Elective  | BiS202     | 41.202        | Cell Biology                                       | 3:0:3(4)                          | Fall        | *BS202 |
|                 | BiS208     | 41.208        | Biochemistry II                                    | 3:0:3(3)                          | Fall        | *BS208 |
|                 | BiS221     | 41.221        | General Biochemistry                               | 3:0:3(6)                          | Spring      |        |
|                 | BiS223     | 41.223        | Physical Principles in Biological Engineering      | 3:0:3(6)                          | Spring      |        |
|                 | BiS225     | 41.225        | Anatomy & Physiology                               | 3:0:3(6)                          | Spring      |        |
|                 | BiS232     | 41.232        | Bio-Data Structures                                | 3:0:3(6)                          | Fall        | *CS206 |
|                 | BiS252     | 41.252        | Bioinstrumentation Fundamentals                    | 3:0:3(6)                          | Fall        |        |
|                 | BiS321     | 41.321        | Systems Biotechnology                              | 3:0:3(6)                          | Spring      |        |
|                 | BiS328     | 41.328        | Brain Science Fundamentals                         | 3:0:3(6)                          | Fall        |        |
|                 | BiS332     | 41.332        | Bio-Information Processing                         | 3:0:3(6)                          | Spring,Fall |        |
|                 | BiS335     | 41.335        | Biomedical Statistics & Statistical Learning       | 3:0:3(6)                          | Spring,Fall |        |
|                 | BiS340     | 41.340        | Interdisciplinary Approach to Network Science      | 3:0:3(6)                          | Fall        |        |
|                 | BiS351     | 41.351        | Bio-Signal Processing                              | 3:0:3(6)                          | Spring      |        |
|                 | BiS352     | 41.352        | System Modeling in Bioengineering                  | 3:0:3(6)                          | Fall        |        |
|                 | BiS354     | 41.354        | Analog Microelectronics Circuits                   | 3:0:3(6)                          | Fall        |        |
|                 | BiS355     | 41.355        | Digital Systems Laboratory and Bio-applications    | 3:0:3(6)                          | Fall        |        |
|                 | BiS371     | 41.371        | Biofluidics  | 3:0:3(6)                          | Fall        |        |
|                 | BiS372     | 41.372        | Dynamic Motion and Response                        | 3:0:3(6)                          | Fall        |        |
|                 | BiS377     | 41.377        | Biomechanics                                       | 3:0:3(6)                          | Spring      |        |
|                 | BiS400     | 41.400        | Special Topics in Bio and Brain Engineering        | 3:0:3(6)                          | Spring,Fall |        |
|                 | BiS401     | 41.401        | Special Topics in Bio and Brain Engineering (1)    | 1:0:1(2)                          | Spring,Fall |        |
|                 | BiS402     | 41.402        | Special Topics in Bio and Brain Engineering (2)    | 2:0:2(4)                          | Spring,Fall |        |
|                 | BiS410     | 41.410        | Bioengineering Senior Project                      | 1:6:3(3)                          | Spring      |        |
|                 | BiS422     | 41.422        | Science Communication & Leadership                 | 3:0:3(6)                          | Fall        |        |
|                 | BiS423     | 41.423        | Molecular Biology                                  | 3:0:3(4)                          | Spring      | *BS433 |
|                 | BiS424     | 41.424        | Instrumental Analysis for Biomaterials             | 3:0:3(6)                          | Fall        | *CH463 |
|                 | BiS425     | 41.425        | Biotechnology Laboratory                           | 1:6:3(3)                          | Spring,Fall |        |
|                 | BiS427     | 41.427        | Computational Neuroscience                         | 3:0:3(6)                          | Spring      |        |
|                 | BiS428     | 41.428        | Introduction to Clinical Neuroscience              | 3:0:3(6)                          | Spring,Fall |        |
|                 | BiS429     | 41.429        | Brain-Inspired Machine Intelligence                | 3:0:3(6)                          | Spring      |        |
|                 | BiS437     | 41.437        | Bio-Data Engineering                               | 3:0:3(6)                          | Spring      |        |
|                 | BiS438     | 41.438        | Bioinformatics                                     | 3:0:3(6)                          | Fall        |        |
|                 | BiS451     | 41.451        | Cognitive Neuroscience                             | 3:0:3(6)                          | Fall        |        |
|                 | BiS452     | 41.452        | Biomedical Imaging                                 | 3:0:3(6)                          | Fall        |        |
|                 | BiS456     | 41.456        | Methods for Neuroimaging                           | 3:0:3(6)                          | Spring,Fall |        |
|                 | BiS470     | 41.470        | BioNano Engineering                                | 3:0:3(6)                          | Spring      |        |
|                 | BiS471     | 41.471        | Bio-inspired Systems                               | 3:0:3(6)                          | Spring      |        |
|                 | BiS472     | 41.472        | Micro Heat & Mass Transfer                         | 3:0:3(4)                          | Fall        |        |
|                 | BiS473     | 41.473        | BioNano Laboratory                                 | 0:9:3(6)                          | Fall        |        |
|                 | BiS481     | 41.481        | Collective Intelligence in Biomedical Applications | 3:0:3(6)                          | Fall        |        |
| Research        | BiS490     | 41.490        | Graduation Research                                | 0:6:3                             |             |        |
|                 | BiS495     | 41.495        | Individual Study                                   | 0:6:1                             |             |        |
|                 | BiS496     | 41.496        | Seminar  | 1:0:1                             |             |        |

※ Notes 1) 400 level courses open to graduate students. (except 41.410)

2) \* stands for substitutable courses

## Curriculum List (graduate program)

| Classification | Course No. | Computer Code                         | Course Name                                       | Lecture;Lab.; Credit (Assignment) | Semester    | Note   |
|----------------|------------|---------------------------------------|---|-----------------------------------|-------------|--------|
| Elective       | BiS500     | 41.500                                | Bioinformation and Bioelectronics                 | 3:0:3(3)                          | Spring      |        |
|                | BiS502     | 41.502                                | Bioanalytical Technology                          | 3:0:3(6)                          | Fall        |        |
|                | BiS510     | 41.510                                | Technology Commercialization and Venture Business | 3:0:3(6)                          | Spring      |        |
|                | BiS521     | 41.521                                | Biology for Engineers                             | 3:0:3(6)                          | Spring      |        |
|                | BiS522     | 41.522                                | Genomics and Proteomics                           | 3:0:3(4)                          | Fall        |        |
|                | BiS523     | 41.523                                | Information and Electronics for Scientists        | 3:0:3(6)                          | Spring      |        |
|                | BiS524     | 41.524                                | Biopharmaceuticals                                | 3:0:3(6)                          | Fall        |        |
|                | BiS525     | 41.525                                | Brain Dynamics                                    | 3:0:3(6)                          | Spring      |        |
|                | BiS526     | 41.526                                | Methods in Neuroscience                           | 3:0:3(6)                          | Spring      |        |
|                | BiS527     | 41.527                                | Theory of Brain Function                          | 3:0:3(6)                          | Spring,Fall |        |
|                | BiS528     | 41.528                                | Cognitive Design and Interface                    | 3:0:3(6)                          | Fall        |        |
|                | BiS529     | 41.529                                | Neural Basis of Spatial Cognition                 | 3:0:3(6)                          | Spring,Fall |        |
|                | BiS531     | 41.531                                | Genome Bioinformatics                             | 3:0:3(6)                          | Spring      |        |
|                | BiS532     | 41.532                                | Bioinformatics Laboratory                         | 2:3:3(6)                          | Fall        |        |
|                | BiS533     | 41.533                                | Computing Technology                              | 3:0:3(6)                          | Spring,Fall |        |
|                | BiS534     | 41.534                                | Systems Biology                                   | 3:0:3(6)                          | Spring      |        |
|                | BiS536     | 41.536                                | Proteome Bioinformatics                           | 3:0:3(6)                          | Fall        |        |
|                | BiS551     | 41.551                                | Medical Image Processing                          | 3:0:3(3)                          | Spring      |        |
|                | BiS552     | 41.552                                | Digital Biomedical Signal Processing              | 3:0:3(6)                          | Fall        |        |
|                | BiS553     | 41.553                                | Biophotonics                                      | 3:0:3(6)                          | Spring,Fall |        |
|                | BiS554     | 41.554                                | Neural Networks                                   | 3:0:3(6)                          | Fall        | *EE538 |
|                | BiS571     | 41.571                                | BioElectroMechanics                               | 3:0:3(6)                          | Spring      |        |
|                | BiS572     | 41.572                                | Microtransducers and Laboratory                   | 2:3:3(6)                          | Fall        |        |
|                | BiS575     | 41.575                                | Nanobiophysics                                    | 3:0:3(6)                          | Fall        |        |
|                | BiS622     | 41.622                                | Metabolic Engineering                             | 3:0:3(3)                          | Fall        |        |
|                | BiS627     | 41.627                                | Clinical Neuroscience                             | 3:0:3(3)                          | Spring      |        |
|                | BiS628     | 41.628                                | Learning and Memory Systems                       | 3:0:3(6)                          | Spring,Fall |        |
|                | BiS631     | 41.631                                | Data Mining                                       | 3:0:3(6)                          | Spring      |        |
|                | BiS632     | 41.632                                | Biostatistics                                     | 3:0:3(6)                          | Spring,Fall |        |
|                | BiS633     | 41.633                                | Bio-Intelligence                                  | 3:0:3(6)                          | Spring      |        |
|                | BiS634     | 41.634                                | Database Construction                             | 3:0:3(6)                          | Fall        |        |
|                | BiS651     | 41.651                                | Hearing and Auditory Model                        | 3:0:3(6)                          | Spring      |        |
|                | BiS652     | 41.652                                | Human Visual Model                                | 3:0:3(6)                          | Fall        |        |
|                | BiS653     | 41.653                                | Advanced MRI Techniques                           | 3:0:3(6)                          | Spring      | *EE737 |
|                | BiS671     | 41.671                                | Nanomaterial Process and Behavior                 | 3:0:3(4)                          | Spring      |        |
|                | BiS672     | 41.672                                | Nano Electro Mechanical Systems                   | 3:0:3(4)                          | Fall        |        |
|                | BiS673     | 41.673                                | Bioelectronic Devices                             | 3:0:3(6)                          | Spring      |        |
|                | BiS675     | 41.675                                | Biomimetics in Biomedical Engineering             | 3:0:3(6)                          | Fall        |        |
|                | BiS721     | 41.721                                | Computational Cell Biology                        | 3:0:3(6)                          | Spring      |        |
|                | BiS722     | 41.722                                | Cell Signaling Network                            | 3:0:3(6)                          | Fall        |        |
| BiS723         | 41.723     | Advanced Cognitive Neuroscience       | 3:0:3(6)  | Fall                              |             |        |
| BiS731         | 41.731     | Bio-Pattern Recognition               | 3:0:3(6)  | Spring                            |             |        |
| BiS732         | 41.732     | Bio-Network                           | 3:0:3(6)  | Spring,Fall                       |             |        |
| BiS735         | 41.735     | Computer Graphics and Bio-Application | 2:3:3(6)  | Spring                            | *CS580      |        |

| Classification | Course No. | Computer Code | Course Name                                       | Lecture;Lab.; Credit (Assignment) | Semester    | Note |
|----------------|------------|---------------|---|-----------------------------------|-------------|------|
| Elective       | BiS752     | 41.752        | Neural Engineering                                | 3:0:3(6)                          | Spring      |      |
|                | BiS771     | 41.771        | Nanobiotechnology                                 | 3:0:3(4)                          | Spring      |      |
|                | BiS772     | 41.772        | Nano-Micro-Machining Process Laboratory           | 2:3:3(4)                          | Fall        |      |
|                | BiS773     | 41.773        | Nanotechnology in Medicine                        | 3:0:3                             | Fall        |      |
|                | BiS800     | 41.800        | Special Lectures in Bio and Brain Engineering     | 3:0:3(6)                          | Spring,Fall |      |
|                | BiS801     | 41.801        | Special Lectures in Bio and Brain Engineering (1) | 1:0:1(2)                          | Spring,Fall |      |
|                | BiS802     | 41.802        | Special Lectures in Bio and Brain Engineering (2) | 2:0:2(4)                          | Spring,Fall |      |
|                | BiS810     | 41.810        | Leadership & Communication                        | 3:0:3(6)                          | Fall        |      |
| Research       | BiS960     | 41.960        | Thesis/Dissertation Research (Master)             |                                   |             |      |
|                | BiS965     | 41.965        | Individual Study (Master)                         |                                   |             |      |
|                | BiS966     | 41.966        | Seminar (Master)                                  | 1:0:1                             |             |      |
|                | BiS980     | 41.980        | Thesis/Dissertation Research (Doctoral)           |                                   |             |      |
|                | BiS986     | 41.986        | Seminar (Doctoral)                                | 1:0:1                             |             |      |
|                | BiS987     | 41.987        | Biofusion Seminar                                 | 1:0:1                             |             |      |

- ※ Notes: 1) 500 level courses open to undergraduate students  
2) \* stands for substitutable courses

## Alternative Course List

| Alternative courses in the department |                           |                      |                               |                          |                  |
|---------------------------------------|---------------------------|----------------------|-------------------------------|--------------------------|------------------|
| Category                              | Courses currently offered |                      | Courses not currently offered |                          |                  |
|                                       | Course no.                | Course title         | Course no                     | Course title             | Remark           |
| Undergraduate                         | BiS437                    | Bio-Data Engineering | BiS331                        | Bio Computer Engineering | course abolished |
| Undergraduate                         | BiS438                    | Bioinformatics       | BiS331                        | Bio Computer Engineering | course abolished |

| Alternative courses offered by other departments |                                   |  |                                      |                                      |                             |
|--|-----------------------------------|--|--------------------------------------|--------------------------------------|-----------------------------|
| Category   | Courses offered by the department |  | Courses offered by other departments |                                      |                             |
|  | Course no.                        | Course no.                             | Course no.                           | Course no.                           | Remark                      |
| Undergraduate                                    | BiS202                            | Cell Biology                           | BS202                                | Cell Biology                         | Bidirectional substitution  |
| Undergraduate                                    | BiS208                            | Biochemistry II                        | BS208                                | Biochemistry II                      | Bidirectional substitution  |
| Undergraduate                                    | BiS232                            | Bio-Data Structures                    | CS206                                | Data Structure                       | unidirectional substitution |
| Undergraduate                                    | BiS423                            | Molecular Biology                      | BS433                                | Molecular Biology of Gene Regulation | unidirectional substitution |
| Undergraduate                                    | BiS424                            | Instrumental Analysis for Biomaterials | CH463                                | Introduction to Analytical Chemistry | unidirectional substitution |
| Graduate   | BiS554                            | Neural Networks                        | EE538                                | Neural Networks                      | unidirectional substitution |
| Graduate   | BiS653                            | Advanced MRI Techniques                | EE737                                | Medical Imaging Technology           | unidirectional substitution |
| Graduate   | BiS735                            | Computer Graphics and Bio-Application  | CS580                                | Interactive Computer Graphics        | unidirectional substitution |