MAJOR IN BIOTECHNOLOGY (2013-2014)
Fermentation/Microbiology

Date: __________ ID: __________________ Name: _______________________________________

E-mail: __________________________ Phone: __________________________

☐ English Composition Requirement ................................................................. 0-8
(See College requirement) __________________________ ______________________

☐ Upper Division Composition (may overlap with English Composition Requirement)....... 4
One of: UWP 101, 102A, 102B, 102C, 102D, 102E, 102F, 102G, 102H, 102I, 102J, 102K,
102L, 104A, 104B, 104C, 104D, 104E, 104F, 104I, 104T

☐ Breadth/General Education ........................................................................ 24-36
(See University requirement)

☐ General Education II
☐ General Education III
☐ IGETC

☐ Preparatory Subject Matter ........................................................................ 58-66
☐ PLS 120 (4), Applied Statistics in Ag. Science (F); or STA 100 (4), Applied Statistics for
  Bio. Sciences (FWSU)
☐ BIT 1 (4), Introduction to Biotechnology (S)
☐ BIS 2A (5), Intro. Biology (FWSU)
☐ BIS 2B (5), Intro. Biology (FWSU)
☐ BIS 2C (5), Intro. Biology (FWSU)
☐ CHE 2A (5), General Chemistry (FWU)
☐ CHE 2B (5), General Chemistry (WSU)
☐ CHE 2C (5), General Chemistry (FWSU)
☐ Organic Chemistry, select one of the following groups:
  ☐ CHE 8A (2), Organic Chem.: Brief Course (FSU); and
    ☐ CHE 8B (4), Organic Chem.: Brief Course (FWU); or
  ☐ CHE 118A (4), Organic Chem. For Health and Life Sciences (FWSU); and
    ☐ CHE 118B (4), Organic Chem. For Health and Life Sciences (FWSU); and
    ☐ CHE 118C (4), Organic Chem. For Health and Life Sciences (FWSU); or
  ☐ CHE 128A (3), Organic Chem. (FW); and
    ☐ CHE 128B (3), Organic Chem. (WS); and
    ☐ CHE 128C (3), Organic Chem. (FS); and
    ☐ CHE 129A (2), Organic Chem. Lab (FW)
☐ Math, select one from the following groups:
  ☐ MAT 16A (3), Short Calculus (FWSU); and
    ☐ MAT 16B (3), Short Calculus (FWSU); or
  ☐ MAT 17A (4), Calculus for Bio and Med (FWS); and
    ☐ MAT 17B (4), Calculus for Bio and Med (FWS); or
  ☐ MAT 21A (4), Calculus (FWSU); and
    ☐ MAT 21B (4), Calculus (FWSU)
☐ PHY 7A (4), General Physics (FWSU)
☐ PHY 7B (4), General Physics (FWSU)
Depth Subject Matter..................................................................................................................16-20

- BIS 101 (4), Genes and Gene Expression (FWSU) BIS 2C; CHE 8B or 118B or 128B
- BIS 104 (3), Regulation of Cell Function (FWSU) BIS 101 and (102 or 105)
- MCB 121 (3), Molecular Biology of Eukaryotic Cells (FWS) BIS 101 and (103 or 105)
- BIT 171 (3), Professionalism and Ethics in Genomics and Biotechnology (FWS) UD standing/natural science major
- 192, Internship; and/or 199, Independent Research; and/or BIT 189L, Laboratory Research in Genomics and Biotechnology; (3 total) (FWSU) consent of instructor
- BIT 188 (3), Undergraduate Research Proposal (S) upper div. standing (Optional)
- BIT 194H (1), Honor's Undergraduate Thesis (Optional)

Specific Course Requirements........................................................................................................23-30

- Biochemistry, select one of the following groups:
  - BIS 102 (3), Structure and Function of Biomolecules (FWSU) CHE 8B or 118B or 128B;
    - BIS 103 (3), Bioenergetics and Metabolism (FWSU) BIS 102
  - ABI 102 (5), Animal Biochemistry and Metabolism (F) CHE 8B or 118B or 128B; and
    - ABI 103 (5), Animal Biochemistry and Metabolism (W) ABI 102
- MIC 104 (4), General Microbiology (F) BIS 101;103
- Select two of the following courses:
  - MIC 140 (3), Bacterial Physiology (not being offered) BIS 101,103/105 (concurrently ok) MIC 102 or 104 recommended
  - MIC 150 (3), Bacterial Genetics (not being offered) BIS 101; 102 or 105; MIC 102 or 104 recommended (may be taken concurrently)
  - PLP 130 (3), Fungal Biotechnology and Biochemistry (W) BIS 103
  - MIC 170 (3), Yeast Molecular Genetics (not being offered) BIS 101; 102 or 105; MIC 102 or 104 recommended (may be taken concurrently)
  - MIC 115 (3), Recombinant DNA Cloning and Analysis (F) BIS 101 or equivalent
  - MCB 182 (3), Principles of Genomics (W) BIS 101
  - BIS 181 (3), Comparative Genomics (F) BIS 101
  - BIS 183 (3), Functional Genomics (S) BIS 101; BIS 102 or 105 recommended
  - MIC 104L (3), General Microbiology Lab (F), MIC 104 (may be taken concurrently); or FST 104L (4), Food Microbiology Lab (S) BIS 2A, FST 104
  - BIT 161A (6) Genetics and Biotechnology Lab (WU) PLS 152 or BIS 101; or MCB 160L (4), Principles of Genetics Laboratory (FWS) BIS 101
Restricted Electives

Note: No course may be used to satisfy more than one requirement.

Select from:

☐ BIS 132 (4) Dynamic Models in Modern Biology BIS 2A, MAT 16C, STA 13
☐ BIS 181 (3) Comparative Genomics (F) BIS 101
☐ BIS 183 (3) Functional Genomics (S) BIS 101; course 102 or 105 recommended
☐ BIT 150 (4), Applied Bioinformatics (Not offered) ECS 10 or 15, or PLS 21; BIS 101 and 104; PLS 120, or STA 13 or 100
☐ BIT 188 (3), Undergraduate Research Proposal (S) Upper division standing
☐ BIT 161B (4), Plant Genetics and Biotechnology Lab (S) PLS 152 or BIS 101
☐ CHE 107A (3), Physical Chemistry for the Life Sciences (F) CHE 2C, MAT 16C or 21C, one year of physics
☐ CHE 107B (3), Physical Chemistry for the Life Sciences (W) CHE 107A
☐ CHE 130A (3), Pharmaceutical Chemistry (W) CHE 118C or 128C
☐ CHE 130B (3), Pharmaceutical Sciences (S) CHE 130A
☐ ECH 161C (4), Biotechnology Facility Design and Regulatory Compliance (W) ECH 161A & 161B (may be taken concurrently)
☐ ECH 161L (4), Bioprocess Engineering Lab (S) ECH 161A and 161B, or BIS 103 and MCB 120L
☐ ECS 124 (4) Theory and Practice of Bioinformatics (F) ECS 10 or 30, or ENG 6; STA 100
☐ EVE 100 (4), Introduction to Evolution (FWSU) BIS 2C, BIS 101, MAT 16ABC, STA 13 or 100
☐ FST 102A (4), Malting and Brewing Science (W) BIS 103; senior standing recommended
☐ FST 102B (4), Practical Malting and Brewing (S) FST 102A and analytical experience beyond CHE 2C, such as VEN 123, FST 103 and 123L, MCB 120L
☐ FST 104 (3), Food Microbiology (W) BIS 2A, 102
☐ FST 104L (4), Food Microbiology Lab (S) BIS 2A, FST 104
☐ FST 110A (3), Physical Principles in Food Processing (F) PHY 7A-7B-7C or equiv., calculus recommended
☐ FST 110B (3) Heat and Mass Transfer in Food Processing (W) FST 110A or equiv.; ABT 110L recommended (may be taken concurrently)
☐ FST 123 (3), Intro. to Enzymology (S) BIS 103
☐ FST 123L (2), Enzymology Lab (S) BIS 103, FST 123 (concurrently)
☐ MIC 105 (3), Bacterial Diversity (W) MIC 102 or 104, BIS 102, BIS 103 recommended
☐ MIC 105L (2), Bacterial Diversity Laboratory (W) MIC 102, 102L or 104, 104L, BIS 105, MIC 105 (may be taken concurrently), BIS 103 recommended
☐ MIC 115 (3), Recombinant DNA Cloning and Analysis (F) BIS 101
☐ MIC 140 (3), Bacterial Physiology (F) BIS 101, 102, 103 (may be taken concurrently) or BIS 101 and 105; MIC 102 OR 104 recommended (may be taken concurrently)
☐ MIC 150 (3), Bacterial Genetics (W) BIS 101; 102 or 105; MIC 102 or 104 recommended (may be taken concurrently)
☐ MIC 155L (4), Bacterial Physiology Lab (not currently offered) MIC 140 or 150, 102L or 104L, consent of instructor
☐ MIC 162 (4), General Virology (W) BIS 102 or 105
☐ MIC 170 (3), Yeast Molecular Genetics (S) BIS 101 and 102, MIC 102 or 104 strongly recommended (may be taken concurrently)
☐ MCB 120L (6), Biotechnology Lab (FWSU) BIS 103 (may be taken concurrently)
☐ MCB 164 (3), Advanced Eukaryotic Genetics (S) MCB 161 or 121
☐ PLP 130 (3), Fungal Biotechnology and Biochemistry (W), BIS 103
☐ PLP 140 (4), Agricultural Biotechnology, Ethics and Public Policy (S) none
☐ PLS 174 (3), Microbiology and Safety of Produce (not currently offered) PLS 2 or BIS 2C
☐ VEN 124 (2) Wine Production (F) VEN 3, 123 (may be taken concurrently), BIS 102 (requires PTA from department)
☐ VEN 124L (3), Wine Production Lab (F) VEN 124 (may be taken concurrently) (requires PTA from department)
☐ VEN 128 (2), Wine Microbiology (W) VEN 123 and 124; Microbiology 102 and 102L, or FST 104 and 104L; VEN 125 and 126 recommended (requires PTA from department)
☐ VEN 135 (4), Wine Technology and Winery Systems (S) VEN 124 (requires PTA from department)
☐ MCB 182 (3), Principles in Genomics (W) BIS 101, MCB 121

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