

My recommended courses for the Biomath stream --- Theme: Complexity

1) Major electives (15 to 18 units)

- a. AMAT 180 – introduction to deterministic biomath
- b. AMAT 115 – useful for evolutionary games etc.
- c. MATH 182 – biosystems are stochastic in nature
- d. Thesis option (for DOST) or Math 111 (for graduate studies)
- e. MATH 152 (PDE, focus on DE) or AMAT 163 (Metaheuristics, focus on simulation)
- f. AMAT 185 – Technomathematics in Life and Social Sciences (to be instituted; includes discussion in data mining with bioinformatics, and complex systems; for now this will be offered in Special Topics; with laboratory/tutorial time) PR: Junior standing
Special Topics (AMAT 191 special section for biomath)

Lunch journal-reading session (faculty-student rotation once a week for 1-2 hrs, 11:30am-1:30pm; SP and graduate students are required to attend): “Biomathematics Exploration” --- this is literature scrutiny focusing on specialized topics, such as molecular/cellular systems biology, mathematical neuroscience/cognition, agent-based modeling, evolutionary games, stochastic simulation, algebraic models, from theory to experiments, drug discovery, complex networks robustness, bioinformatics, etc.) PR: Senior standing

2) Electives (12 units)

Possible courses: (this needs to be updated because of K-12 and there are already required Physics, Chemistry and Biology courses)

- a. General Biology
 - i. BIO 30 – Genetics (offered 1st and 2nd sem; PR. BIO 2 or BIO 3 or BOT 1 & ZOO 1)
 - ii. BIO 140 – Evolutionary Biology (offered 1st and 2nd sem; PR. BIO 30)
 - iii. BIO 150 – Ecology (offered 1st and 2nd sem; PR BIO 2 or BIO 3 or BOT 1 & ZOO 1)
 - iv. BIO 70 – Earth’s Processes and Biological Systems (offered 1st and 2nd sem; PR. BOT 1 & ZOO 1 & CHEM)
 - v. BIO 102 – Cytology (offered 1st and 2nd sem; PR. BIO 30)
 - vi. BIO 131 – Cytogenetics (offered 2nd sem; PR. BIO 30)
 - vii. BIO 130a – Advanced Genetics I (offered 1st and 2nd sem; PR. BIO 30)
 - viii. BIO 130b – Advanced Genetics II (offered 2nd sem; PR. BIO 30)
 - ix. BIO 151 – Environmental Management (offered 1st and 2nd sem; PR. BIO 150)
 - x. BIO 155 – Biology of Pollution (offered 1st; PR. BIO 150)
 - xi. BIO 159 – Conservation Biology in the Tropics (offered 2nd sem; PR. BIO 150)
- b. Plant Biology
 - i. BOT 1 (offered 1st and 2nd sem)
 - ii. BOT 110 – Morphology and Anatomy of Plants (offered 1st; PR. BOT 1)
 - iii. BOT 20 – Elementary Plant Physiology (offered 1st and 2nd sem; PR. BOT 1 and CHEM)

- iv. BOT 132 – Plant Growth (offered 1st and 2nd sem; PR. BOT 20)
- v. BOT 142 – Economic Botany
- c. Microbio
 - i. MCB 1 (offered 1st and 2nd sem)
 - ii. MCB 102 – General Virology (offered 1st and 2nd sem)
 - iii. MCB 103 – Medical Microbio (offered 1st and 2nd sem; PR MCB 1)
 - iv. MCB 150 – Microbial Ecology (offered 1st and 2nd sem; PR MCB 1)
 - v. MCB 180 – Food Microbio (offered 1st and 2nd sem; PR MCB 1)
 - vi. MCB 181 – Dairy Microbio (offered 1st and 2nd sem; PR MCB 1)
- d. Zoology
 - i. ZOO 1 (offered 1st and 2nd sem)
 - ii. ZOO 117 – Developmental Zoo (offered 1st and 2nd sem; PR ZOO 1 or ZOO 3)
 - iii. ZOO 122 – Animal Behavior (offered 1st sem; PR ZOO 1 or ZOO 3)
 - iv. ZOO 150 – Animal Ecology (offered 1st and 2nd sem; PR ZOO 1 or BIO 2 or BIO 3)
 - v. ZOO 173 – Parasitology (offered 1st and 2nd sem; PR ZOO 1 or BIO 2 or BIO 3)
 - vi. ZOO 177 – Vertebrate Pests (offered 1st and 2nd sem; PR ZOO 1 or BIO 2 or BIO 3)
 - vii. ZOO 185 – Aquaculture (offered 1st and 2nd sem; PR ZOO 1 or BOT 1 or BIO 3 or COI)
- e. Forestry
 - i. FBS 26 or 126 – Forest Entomology (offered 1st / 2nd sem; PR ZOO 1)
 - ii. FRM 100 – Forest Resource Management (offered 1st and 2nd sem)
 - iii. FRM 104 – GIS (offered 1st and 2nd sem)
 - iv. FRM 167 – Experimental Design in Forestry
- f. Statistics (choose only one) – highly recommended
 - i. STAT 162 – Experimental Designs I
 - ii. STAT 175 – Analysis of Multivariate Data
- g. Agriculture
 - i. ASYS 101 – Sustainable Agri Systems (offered 1st sem)
 - ii. CRPT 1 – Crop Protection (offered 1st and 2nd sem)
 - iii. CRPT 2 – Pest Management (offered 1st and 2nd sem; PR CRPT 1)
 - iv. SOIL 1 – Principles of Soil Science
 - v. SOIL 111 – Soil and Land Use (PR. SOIL 1)
 - vi. SOIL 120 (Microbio), SOIL 130 (Physics), SOIL 140 (Chemistry), SOIL 142 (Fertilizers)
 - vii. ANSC 1 (Intro), ANSC 2 (Livestock and Poultry Production), ANSC 70 (Feeding), ANSC 101 (Anatomy and Physiology) [others: ANSC 111, 116, 121, 122]
 - viii. CRSC 1, CRSC 2
 - ix. AGR 110 (Grains), AGR 133 (Weeds), HORT 20 (Vegetables), HORT 30 (Fruits and crops), HORT 132 (Growth)
- h. Entomology (from CA)
 - i. ENT 101 (offered 1st and 2nd sem; PR BIO 2 or BIO 3 or ZOO 1)
- i. VETMED: ZOOTECHNICS ZOTC 111, ZOTC 113, ZOTC 114, ZOTC 116

j. Social Science

- i. ANTH 10 – Introduction to Social and Cultural Anthropology (offered 1st and 2nd sem)
- ii. ANTH 130 – Ecological Anthropology (offered 2nd sem; PR ANTH 10)
- iii. POSC 10 – Principles of Government and Politics (offered 1st and 2nd sem)
- iv. POSC 112 – Politics of Development (offered 2nd sem; PR POSC 10)
- v. SOC 112 – Sociology of Politics (offered 2nd sem)
- vi. PSY 140 – Psychology of Learning (offered 1st sem)
- vii. PSY 148 – Cognitive Psychology (offered 2nd sem)
- viii. SOC 130 – Social Psychology (offered 1st and 2nd sem)
- ix. PSY 155 – Abnormal Psychology (offered 2nd sem)
- x. SOC 10, **SOC 100 (Social Organization)**, SOC 105, **SOC 114 (Sociology of Economic Life)**, SOC 115, SOC 119, **SOC 120 (Urban Sociology)**, SOC 129, SOC 135, **SOC 140 (Introduction to Demography)**, **SOC 160 (Social Change)**, **SOC 165 (Sociology of Development)**, **SOC 180 (Collective behavior)**
- xi. ECON 11 – General Economics

ETC... ETC... ETC...

Please double check the updated course catalogue.

I also suggest to have co-adviser/resource person from IBS, CA, SESAM, CFNR, CVM or DSS.

Sample Combinations:

- 1) Genetics: (BOT 1 and ZOO 1), Bio 30, BIO 130a and BIO 131
- 2) *,**Genetics and Evolution: (BOT 1 and ZOO 1), Bio 30, BIO 130b and BIO 140
- 3) *,**General Ecology and Environment: (BOT 1 and ZOO 1), BIO 70, BIO 150 and (BIO 151 or BIO 155 or BIO 159)
- 4) *Medical Microbio: (MCB 1), MCB 102, MCB 103, MCB 150 and ZOO 173
- 5) *Food Microbio: (MCB 1), MCB 180, MCB 181, MCB 150 and ZOO 173
- 6) *Ethology (Animal behavior): (ZOO 1), ZOO 122, ZOO 150 and ZOO 117 + STAT 175
- 7) *Animal developmental biology: (ZOO 1 and BOT 1), ZOO 117, BIO 30 and BIO 102
- 8) Botany: (BOT 1), BOT 20, BOT 110, BOT 132 and BOT 142
- 9) Zoo Parasitology: (ZOO 1), ZOO 173, MCB 1, ZOO 177 and MCB 103
- 10) *Plant Pest Control: (BOT 1 and ZOO 1), CRPT 1, CRPT 2, (ENT 101 or FBS 26/126)
- 11) **Agri and Aquaculture: (ZOO 1 and BOT 1), ZOO 185, ASYS 101 and ANSC 1
- 12) Soil Science: SOIL 1, SOIL 111 + 2 other SOIL courses
- 13) Forestry Management: (ZOO 1 and BOT 1), FRM 100 and FRM 104 + (STAT 162 or FRM 167)
- 14) **General Social Science: ANTH 10, ECON 11, SOC 100, SOC 160
- 15) Social Science (Economics): SOC 114, SOC 165, ANTH 10, ANTH 130
- 16) Social Science (Population): SOC 100, SOC 180, SOC 140, SOC 120

- 17) Social Science (Politics): POSC 10, POSC 112, SOC 112, SOC 160
- 18) **Social Science (Psychology): PSY 140, PSY 148, SOC 130, PSY 155
- 19) VETMED: (ZOO 1), ZOTC 111, ZOTC 113, ZOTC 114, ZOTC 116
- 20) *Animal Science: (ZOO1), ANSC 1, ANSC 2, ANSC 70, ANSC 101
- 21) *Crop Science: (BOT 1), CRSC 1, CRSC 2, + 2 AGR/HORT courses

*Recommended for thesis students (specialized)

* or **Recommended for SP students

Students should be distributed regularly to promote diversity.