Applied Molecular Biology and Biotechnology (AMBB) Major <u>Curriculum for 2023-2024 Academic Year</u> 122 Credits & ≥2.0 Cumulative GPA Required for Graduation

| University Requirements: | |
|---|---|
| ENGL110 First Year Writing* | |
| First Year Experience I, 1 cr (UNIV101) $\sqrt{-1}$ Discovery Learning Experience (DLE) 3 cr (satisfied by MMSC444) | |
| | |
| University Breadth Requirements* (these must be fr | om four different areas of study/course rubrics) |
| ✓ Creative Arts & Humanities* 3 cr (satisfied by ≥ | ≥ C- in HLTH241) |
| History & Cultural Change* 3 cr | |
| Social & Behavioral Sciences* 3 cr | |
| $\sqrt{1}$ Math Natural Science & Technology* 3 cr (sat | isfied by \geq C- in BISC207 or 208 or CHEM103 or 104) |
| $\sqrt{-2}$ Canstone Experience (satisfied by MMSC444) | |
| | |
| MAJOR REQUIREMENTS (minimun | n grade C- for all required major courses): |
| Mathematics (one of the following; MATH114, 115, 117, 221 or 241; MATH115 required for PHYS201) | |
| Physical and Biological Foundational Sciences (24 credits) | |
| BISC207 Introductory Biology I:4 | CHEM321/325 Org Chem I Lecture/Lab: 3/1 OR |
| BISC208 Introductory Biology II: 4 | CHEM213/215 Elem Org Chem Lec/Lab: 3/1 |
| CHEM103/133 Gen Chem Lecture/Lab I: 4 | CHEM322/326 Org Chem II Lecture/Lab: 3/1 OR |
| CHEM104/134 Gen Chem Lecture/Lab II:4 | CHEM214/216 Elem Biochem Lec/Lab: 3/1 |
| Salanaa Saguanaa (8 aradita). Complete and of the following apquences | |
| Ontion I: | |
| KAAP300 Human Anatomy & Physiology I:4 AND | DHVS201/2211 Introductory Dhysics I: / AND |
| KAAP310 Human Anatomy & Physiology II:4 | FTTT 520 1/22 TE Introductory Physics 1. 4 AND DHVS202/2221 Introductory Physics II: 4 |
| | |
| Core * (63 credits; minimum grad | e of C- required in all "MMSC" courses): |
| ANFS449 Food Biotechnology: 4 | MMSC441Biotechnology Practicum I: 3 |
| HLTH241 Ethical Aspects of Healthcare: 3 | MMSC442Biotechnology Practicum II: 3 |
| MMSC100Intro to Medical & Molec Sciences (P/F): 1 | MMSC443Biotechnology Practicum III: 3 |
| MMSC200 The Language of Medicine 3 | MMSC444Biotechnology Practicum IV: 3 |
| MMSC301 Introduction to Biotechnology: 2 | MMSC450Medical Biochemistry: 4 |
| MMSC375 Biostats for Biological & Hith Sciences: 2 | MMSC451Cell and Tissue Culture Techniques: 4 |
| MMSC408 Molecular Preparatory Techniques: 2 | MMSC461 Laboratory Practice & Leadership I: 1 |
| MMSC415 Clinical Immunology & Medical Virology: 3 | MMSC471 Laboratory Practice & Leadership II: 1 |
| MMSC425Basic Recombinant DNA Techniques: 4 | MMSC490Clinical and Molecular Cell Biology: 3 |
| MMSC426Protein Purification and Characterization: | 3 MMSC491 Human Molecular Genetics: 3 |
| MMSC427Flow Cytometry: 2 | MMSC492Application Molecular Diagnostic |
| MMSC435Introduction to Genomics Proteomics & | |
| Bioinformatics: 3 | \geq 122 credits/2.0 Cum GPA required for graduation |
| | |
| Student Name: | Student Signature: |
| MMSC Program Director | Date. |
| | Duto |

 $\sqrt{-}$ - indicates that this requirement will be satisfied by a course within the required major/core courses

* \geq C- required (in addition to all "MMSC" courses)

Students are initially admitted to the AMBB Interest major and apply for the AMBB-BS typically at the end of the sophomore year. Preferred Criteria for Admission to the AMBB-BS Major: ≥ 2.9 GPA in first four semesters strongly suggested (exceptions considered on a case by case basis): completion of 60 credits including BISC207, BISC208, CHEM103/133, CHEM104/134, CHEM213/215 or 321/325, CHEM214/216 or 322/326, MATH114 AND THE SEQUENCE OF KAAP309 & KAAP310 OR PHYS201 AND PHYS202. Submit request via Webforms in UDSIS.

Students are strongly advised to refer to their Degree Audit regularly (accessed via UDSIS) to confirm progressive completion of graduation reguirements as

designated in the UD online Undergraduate Catalog. Although every effort is made to accurately reflect curriculum requirements here, students are responsible for utilizing the Degree Audit for official confirmation of the status of degree requirement completion. Applied Molecular Biology & Biotechnology program requirements can be found at <u>www.udel.edu/catalog</u> > Programs > Applied Molecular Biology & Biotechnology (BS). Please be sure to select the correct academic year for your program requirements.

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Suggested AMBB Academic Program Sequence

Consult with your advisor for possible alternative sequencing and term availability of courses. MMSC course term availability listed below is proposed for the 2022-23 academic year but is subject to change. Refer to Course Descriptions at https://udapps.nss.udel.edu/CourseDescription/ for associated course Prerequisites and Corequisites.

SPRING - 14 credits

BISC208 Intro Biology II: 4

CHEM104/134 Gen Chemistry: 4

MMSC200 The Language of Medicine: 3

ENGL110 First Year Writing: 3

First Year

FALL – 16 credits BISC207 Intro Biology I: 4 CHEM103/133 Gen Chemistry: 4 Mathematics: 3 MMSC100 Intro to Med & Molecular Sciences (P/F): 1 UNIV101 First Year Experience I: 1 Elective: 3

Second Year

FALL – 16 credits CHEM321/325 Org Chem I Lecture/Lab: 3/1 OR CHEM213/215 Elem Org Chem Lecture/Lab: 3/1 MMSC301 Introduction to Biotechnology: 2 (fall only) PHYS201/221L Introductory Physics I: 4 OR KAAP309 Human Anatomy & Physiology I: 4 Breadth Requirement (e.g. HCC): 3 Elective: 3

Third Year

FALL – 15 credits; MMSC courses below Fall only MMSC408 Molecular Preparatory Techniques: 2 MMSC415 Clin Immunology & Medical Virology: 3 MMSC425 Basic Recombinant DNA Techniques: 4 MMSC490 Clinical and Molecular Cell Biology: 3 Elective: 3

Fourth Year

FALL – 12 credits; MMSC courses below Fall only MMSC375 Biostats for Biological & Health Sciences: 2 MMSC435 Practical Genomics, Proteomics and **Bioinformatics: 3** MMSC441 Biotechnology Practicum I: 3 MMSC442 Biotechnology Practicum II: 3 MMSC461 Laboratory Practice & Leadership I: 1

32 credits

30 credits

SPRING – 16 credits CHEM322/326 Org Chem II Lecture/Lab: 3/1 OR CHEM214/216 Elem Biochem Lecture/Lab: 3/1 PHYS202/222L Introductory Physics II: 4 OR KAAP310 Human Anatomy & Physiology II: 4 Multicultural: 3 Breadth Requirement (e.g. SBS): 3 Elective: 2

32 credits

SPRING – 17 credits; MMSC courses below Spring only MMSC426 Protein Purification & Characterization: 3 MMSC450 Medical Biochemistry: 4 MMSC451 Cell and Tissue Culture Techniques: 4 MMSC491 Human Molecular Genetics (fall & spring): 3 MMSC492 Application of Molecular Diagnostics Techniques: 3

28 credits

SPRING - 16 credits; MMSC courses below Spring only ANFS449 Food Biotechnology: 4 HLTH241 Ethical Aspects of Healthcare: 3 MMSC427 Flow Cytometry: 2 MMSC443 Biotechnology Practicum III: 3 MMSC444 Biotechnology Practicum IV: 3 MMSC471 Laboratory Practice & Leadership II: 1

Total of 122 credits

4+1 BS/MS Program students substitute: 1) MMSC603 Research Design for MMSC375, and 2) MMSC690 Clinical & Molecular Cell Biology for MMSC490