

# Applied Molecular Biology and Biotechnology (AMBB) Major

## Curriculum for 2021-2022 Academic Year

122 Credits & ≥2.0 Cumulative GPA Required for Graduation

### University Requirements:

- ENGL110 Seminar in Composition\*
- First Year Seminar (FYS) 0-4 cr (UNIV101)
- Discovery Learning Experience (DLE) 3 cr (satisfied by MMSC444)
- Multicultural Requirement 3 cr \_\_\_\_\_ (may simultaneously satisfy breadth)
- University Breadth Requirements\* (these must be from **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\* 3cr \_\_\_\_\_
  - Math, Natural Science & Technology\* 3 cr (satisfied by ≥ C- in BISC207 or 208 or CHEM103 or 104)
- Capstone Experience (satisfied by MMSC444)

### MAJOR REQUIREMENTS (minimum 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)

- |   |   |
|---|---|
| <input type="checkbox"/> BISC207 Introductory Biology I:4             | <input type="checkbox"/> CHEM321/325 Org Chem I Lecture/Lab: 3/1 <b>OR</b>  |
| <input type="checkbox"/> BISC208 Introductory Biology II: 4           | <input type="checkbox"/> CHEM213/215 Elem Org Chem Lec/Lab: 3/1             |
| <input type="checkbox"/> CHEM103/133 or 107 Gen Chem Lecture/Lab I: 4 | <input type="checkbox"/> CHEM322/326 Org Chem II Lecture/Lab: 3/1 <b>OR</b> |
| <input type="checkbox"/> CHEM104/134 or 108 Gen Chem Lecture/Lab II:4 | <input type="checkbox"/> CHEM214/216 Elem Biochem Lec/Lab: 3/1              |

#### Science Sequence (8 credits). Complete one of the following sequences:

##### Option 1:

- KAAP309 Human Anatomy & Physiology I:4 **AND**
- KAAP310 Human Anatomy & Physiology II: 4

##### Option 2:

- PHYS201/221L Introductory Physics I: 4 **AND**
- PHYS202/222L Introductory Physics II: 4

#### Core \* (63 credits; minimum grade of C- required in all courses):

- |   |  |
|---|--|
| <input type="checkbox"/> ANFS449 Food Biotechnology: 4                                    | <input type="checkbox"/> MMSC441 Biotechnology Practicum I: 3              |
| <input type="checkbox"/> HLTH241 Ethical Aspects of Healthcare: 3                         | <input type="checkbox"/> MMSC442 Biotechnology Practicum II: 3             |
| <input type="checkbox"/> MMSC100 Intro to Medical Laboratory Science: 1                   | <input type="checkbox"/> MMSC443 Biotechnology Practicum III: 3            |
| <input type="checkbox"/> MMSC200 The Language of Medicine 3                               | <input type="checkbox"/> MMSC444 Biotechnology Practicum IV: 3             |
| <input type="checkbox"/> MMSC301 Introduction to Biotechnology: 2                         | <input type="checkbox"/> MMSC450 Medical Biochemistry: 4                   |
| <input type="checkbox"/> MMSC360 Clinical Immunology & Medical Virology: 3                | <input type="checkbox"/> MMSC451 Cell and Tissue Culture Techniques: 4     |
| <input type="checkbox"/> MMSC375 Stats & Rsrch for Med Lab Scientists: 2                  | <input type="checkbox"/> MMSC461 Laboratory Practice & Leadership I: 1     |
| <input type="checkbox"/> MMSC408 Molecular Preparatory Techniques: 2                      | <input type="checkbox"/> MMSC471 Laboratory Practice & Leadership II: 1    |
| <input type="checkbox"/> MMSC425 Basic Molecular Techniques: 4                            | <input type="checkbox"/> MMSC490 Clinical and Molecular Cell Biology: 3    |
| <input type="checkbox"/> MMSC426 Protein Purification and Characterization: 3             | <input type="checkbox"/> MMSC491 Human Molecular Genetics: 3               |
| <input type="checkbox"/> MMSC427 Flow Cytometry: 2  | <input type="checkbox"/> MMSC492 Application Molecular Diagnostic          |
| <input type="checkbox"/> MMSC435 Introduction to Genomics, Proteomics & Bioinformatics: 3 | <input type="checkbox"/> Techniques: 3                                     |
|   | <input type="checkbox"/> ≥ 122 credits/2.0 Cum GPA required for graduation |

Student Name: \_\_\_\_\_ Student Signature: \_\_\_\_\_

MMSC Program Director: \_\_\_\_\_ Date: \_\_\_\_\_

√ - indicates that this requirement will be satisfied by a course within the required major/core courses

\* ≥ C- required

*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.*

# Applied Molecular Biology and Biotechnology (AMBB) Major

## Curriculum for 2021-2022 Academic Year

122 Credits &  $\geq 2.0$  Cumulative GPA Required for Graduation

### 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 2020-21 academic year but is subject to change. Refer to Course Descriptions at <https://udapps.nss.udel.edu/CourseDescription/> for associated course Prerequisites and Corequisites.

#### First Year

30 credits

##### FALL – 16 credits

BISC207 Intro Biology I: 4  
CHEM103/133 or 107 Gen Chemistry: 4  
Mathematics: 3  
MMSC100 Intro to Med Lab Science: 1  
UNIV101 First Year Seminar: 1  
Elective: 3

##### SPRING – 14 credits

BISC208 Intro Biology II: 4  
CHEM104/134 or 108 Gen Chemistry: 4  
ENGL110 Seminar in Composition: 3  
MMSC200 The Language of Medicine: 3

#### Second Year

32 credit

##### 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

##### SPRING – 16credits

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

#### Third Year

32 credits

##### FALL – 15 credits; MMSC courses below Fall only

MMSC360 Clin Immunology & Medical Virology: 3  
MMSC408 Molecular Preparatory Techniques: 2  
MMSC425 Basic Molecular Techniques: 4  
MMSC490 Clinical and Molecular Cell Biology: 3  
Elective: 3

##### 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: 3  
MMSC492 Application of Molecular Diagnostics Techniques: 3

#### Fourth Year

28 credits

##### FALL – 12 credits; MMSC courses below Fall only

MMSC375 Stats and Research for Med Lab Science: 2  
MMSC435 Practical Genomics, Proteomics and  
Bioinformatics: 3  
MMSC441 Biotechnology Practicum I: 3  
MMSC442 Biotechnology Practicum II: 3  
MMSC461 Laboratory Practice & Leadership I: 1

##### 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

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**Total of 122 credits**

Students are strongly advised to refer to their **Degree Audit** regularly (accessed via UDSIS) to confirm progressive completion of graduation requirements as designated in the UD online Undergraduate Catalog. Applied Molecular Biology & Biotechnology 21-22 program requirements can be found at [https://catalog.udel.edu/preview\\_program.php?catoid=47&moid=34903&returnto=8860](https://catalog.udel.edu/preview_program.php?catoid=47&moid=34903&returnto=8860)

Please be sure to select the correct academic year for your program requirements.