

Bioprocessing Science (BS) (11BBSBS)

Freshman Year

| Fall Semester | Credit | Spring Semester | Credit |
|---|--------|--|--------|
| ALS 103 Freshman Transitions and Diversity in Agriculture and Life Sciences | 1 | CH 101 – A Molecular Science | 3 |
| BIO 183 or BIO 181 Intro Biology | 4 | CH 102 General Chemistry Lab | 1 |
| ENG 101 Academic Writing & Research | 4 | BBS 201 Intro to Biopharmaceutical Science | 3 |
| COM 110 or COM 112 | 3 | MA 131 Calculus for Life & Mgmt Sciences A | 3 |
| GEP Social Science Requirement ^{*D} | 3 | Free Elective ² | 3 |
| HES_*** Health & Exercise Studies Course ^E | 1 | GEP Humanities Requirement ^{*C} | 3 |
| | 16 | | 16 |

Sophomore Year

| Fall Semester | Credit | Spring Semester | Credit |
|---|--------|---|--------|
| CH 221 Organic Chemistry I | 3 | CH 223 Organic Chemistry II | 3 |
| CH 222 Organic Chemistry I Lab | 1 | CH 224 Organic Chemistry II Laboratory | 1 |
| MA 231 Calculus for Life and Management Sciences B | 3 | FS 231 Principles of Food/Bioprocess Engr | 4 |
| PY 211 College Physics I | 4 | PY 212 College Physics II | 4 |
| BEC 220 Intro to Drug Develop & Careers or FS 290 Careers in Food/ Bioprocessing | 1 | Free Elective ² | 3 |
| GEP Interdisciplinary Perspectives Requirement ^{*G} | 3 | | |
| | 15 | | 15 |

Junior Year

| Fall Semester | Credit | Spring Semester | Credit |
|---|--------|--|--------|
| CH 201 Chemistry – A Quantitative Science | 3 | BCH 351 Elementary Biochemistry | 4 |
| CH 202 Quantitative Chemistry Lab | 1 | BEC 330 Principles of Bioseparations | 2 |
| MB 351 General Microbiology | 3 | BEC/BIT Elective | 2 |
| MB 352 General Microbiology Lab | 1 | BEC 440 Manipulation of Recomb DNA or BIT 410 Expression Systems in Bioman | 3-4 |
| Free Elective ² | 3 | GEP Additional Breadth ^{*F} | 3 |
| Anatomy/Physiology Elective | 4 | | |
| | 15 | | 14-15 |

Senior Year

| Fall Semester | Credit | Spring Semester | Credit |
|---|--------|---|--------|
| ST 311 Introduction to Statistics | 3 | FS 475 Problems & Design in Food/ Bioprocessing | 3 |
| BBS 301 Process Validation Science | 3 | FS 416 Quality Control Food/ Bioprocess | 3 |
| BBS 426 Upstream Biomanufacturing Lab | 2 | FS 403 Analytical Techniques | 4 |
| BEC 480 cGMP Fermentation Ops | 2 | GEP Social Science Requirement ^{*D} | 3 |
| GEP Humanities Requirement ^{*C} | 3 | GEP Interdisciplinary Perspectives Requirement ^{*G} | 2 |
| HES_*** Health & Exercise Studies Course E | 1 | | |
| | 14 | | 15 |

Minimum Credit Hours Required for Graduation*:

120

Major/Program Footnotes

1. Biotechnology electives. Students may select any BIT 4XX or BIT 5XX 2-credit laboratory course to fulfill this requirement. Students may opt for a BIT minor by completing an additional approved 1-credit ethics elective.
2. Students are strongly encouraged to complete a minor in a closely related field, and should consult with an advisor in the minor department for the most current requirements. A list of can be viewed online at <http://oucc.ncsu.edu/minors>. Free elective courses taken as credit only may not apply toward a minor.
3. Genetics or Anatomy/Physiology electives. Students are required to select a 4-credit course from GN 311, BIO 212, or BIO 250.
4. Students must have demonstrated foreign language proficiency at the FL 102 level before graduation.
5. Biomanufacturing electives: Students may select BEC 330 or any BEC 4xx 2-credit laboratory course to fulfill this requirement. Prerequisite requirements must be met.

***General Education Program (GEP) requirements and GEP Footnotes**

To complete the requirements for graduation and the General Education Program, the following category credit hours and co-requisites must be satisfied. University approved GEP course lists for each of the following categories can be found at <https://oucc.dasa.ncsu.edu/general-education-program/>.

A. Mathematical Sciences (6 credit hours – one course with MA or ST prefix)

Choose from the University approved GEP Mathematical Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: *NONE*

B. Natural Sciences (7 credit hours – include one laboratory course or course with a lab)

Choose from the University approved GEP Natural Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: *NONE*

C. Humanities (6 credit hours selected from two different disciplines/course prefixes)

Choose from the University approved GEP Humanities course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: *NONE*

D. Social Sciences (6 credit hours selected from two different disciplines/course prefixes)

Choose from the University approved GEP Social Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: *NONE*

E. Health & Exercise Studies (2 credit hours – at least one 100-level Health & Exercise Studies Course)

Choose from the University approved GEP Health & Exercise Studies course list.

F. Additional Breadth – (3 credit hours to be selected from the following checked University approved GEP course lists)

X Humanities/Social Sciences/Visual and Performing Arts

G. Interdisciplinary Perspectives (5-6 credit hours)

Choose from the University approved GEP Interdisciplinary Perspectives course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: *NONE*

H. Introduction to Writing (4 credit hours satisfied by completing ENG 101 with a C- or better)

The following Co-Requisites must be satisfied to complete the General Education Program requirements

I. U.S. Diversity (USD)

Choose from the University approved GEP U.S. Diversity course list or choose a course identified on the approved GEP course lists as meeting the U.S. Diversity (USD) co-requisite. The following course(s) completed as part of the Major requirements may fulfill this requirement:

J. Global Knowledge (GK)

Choose from the University approved GEP Global Knowledge course list or choose a course identified on the approved GEP course lists as meeting the Global Knowledge (GK) co-requisite. The following course(s) completed as part of the Major requirements may fulfill this requirement:

K. Foreign Language proficiency – Proficiency at the FL_102 level is required for graduation.