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| **2022-2023** | **Bachelor of Science (B.S.) Degree – Biology Major – Molecular and Biochemistry Concentration  Name:** **ID:** | | | | | | | |
| Courses in **BOLD** are required by this major  *Courses in ITALIC are strongly recommended*  +denotes courses offered only every other year  § Indicates general education requirement.  \*Indicates course satisfies general education requirement.  Students must choose one 3-hour course in each of the following areas: Art,  History, Humanities,  Natural Science  and  Social Sciences  ALSO REQUIRED FOR GRADUATION:   * 120 credit hours * 39 Upper division credits * 2.00 GPA * Completion of all requirements   Key:  GE##=General Education  LL=Life & Leadership  SS=Strategic Skills  Updated:  10-4-2022 |
| **First Year Fall** | **Learning Outcome** | **Sem Hours** | **Date Met** | **First Year Spring** | **Learning Outcome** | **Sem Hours** | **Date Met** |
| **BIOL1500 Biology I** **w/ lab** \*§ | **GE3D** | **4** |  | **BIOL1520 Biology II w/ lab** |  | **4** |  |
| **CHEM1410 General** Chemistry **I Workshop\*** |  | **4** |  | **CHEM1420 General Chemistry II Workshop** |  | **4** |  |
| **MATH1510 Calculus I\* or**  **MATH1500 Applied Calculus\*** | **GE2B** | 3-4 |  | **CHEM1450 Introduction to Organic and Biochemistry** |  | 1 |  |
| UNIV1100 Digital fluency and citizenship | SS | 3 |  | ENGL1100 – Composition I | GE1A | 3 |  |
| LEAD1100 Self leadership I | LL | 2 |  | LEAD1200 Self Leadership II | LL | 2 |  |
|  |  |  |  | UNIV1200 Health and Wholeness | SS | 3 |  |
| **Total Hours** |  | **16 -17** |  | **Total Hours** |  | **17** |  |
| **Notes:** Join clubs and organizations on campus (Science club etc). Start your networking circle by signing up for GU4U - <https://my.graceland.edu/ICS/Alumni_and_Friends/GU4U/> Find winter break or summer job shadowing and volunteer opportunities. Students who are considering, or are currently, a double major in chemistry, will need to take MATH1510. If you have transferred in a composition course, take a liberal learning course in its place. | | | | | | | |
| **Second Year Fall** | **Learning Outcome** | **Sem**  **Hours** | **Date Met** | **Second Year Spring** | **Learning Outcome** | **Sem Hours** | **Date Met** |
| **BIOL2100 Cell Biology and Genetics w/ lab** |  | **4** |  | **BIOL2360 Microbiology w/ lab** |  | **4** |  |
| **CHEM3410/3411 Org Chem I w/lab** |  | **4** |  | **CHEM3420/3421 Org Chem II w/lab** |  | **4** |  |
| **PHYS1410 Elements of Physics I w/lab** |  | **4** |  | **PHYS1420 Elements of Physics II w/lab** |  | **4** |  |
| COMM1100 – Foundations of Public Speaking | GE1B | 3 |  | ENGL2110 – Composition II | GE1C | 3 |  |
| LEAD2100 Group Leadership I | LL | 2 |  | LEAD2200 Group Leadership II | LL | 2 |  |
| **Total Hours** |  | **17** |  | **Total Hours** |  | **17** |  |
| **Notes:** Find student leadership positions or join a club or organization on campus (Science club, etc.). Check in with faculty regarding any standardized tests/requirements for grad school. Find winter break or summer job-shadowing and volunteer opportunities. If you have transferred in a composition course, take a liberal learning course in its place. | | | | | | | |
| **Third Year Fall**  ***(check your degree audit!)*** | **Learning Outcome** | **Sem**  **Hours** | **Date Met** | **Third Year Spring** | **Learning Outcome** | **Sem Hours** | **Date Met** |
| **+BIOL/CHEM4310 Biochemistry w/ lab** |  | **4** |  | **+BIOL4460 Cell and Cancer Biology** |  | **3** |  |
| MATH1370 Statistics for Sciences | GE2A | **3** |  | **BIOL/CHEM4111 Capstone Research I** |  | **1** |  |
| *BIOL3420 Human Anatomy* w/ lab or Liberal learning course Art § | GE3A | 3-4 |  | *BIOL3440 Human Physiology w/ lab* and/or upper division elective(s) |  | 3-7 |  |
| UNIV2100 Social Responsibility | SS | 3 |  | Liberal learning course- Humanities § | GE3C | 3 |  |
| LEAD3100 Organizational Leadership I | LL | 2 |  | LEAD3200 Organizational Leadership II | LL | 2 |  |
|  |  |  |  |  |  |  |  |
| **Total Hours** |  | **15-16** |  | **Total Hours** |  | **12-16** |  |
| **Notes:** Research and apply for internships fall of the junior year to be completed summer after junior year. Connect with your faculty advisor for assistance with navigating this process. Connect with your faculty advisor in the fall of the junior year to learn more about graduate school applications and standardized test requirements for professional school. If you want to attend graduate school right after senor year, many applications open during the summer. Check in with your advisor during your junior year about career opportunities outside graduate programs. *If you are under 15 hours, consider taking an elective course.* | | | | | | | |
| **Fourth Year Fall**  ***(apply for graduation!)*** | **Learning Outcome** | **Sem**  **Hours** | **Date Met** | **Fourth Year Spring** | **Learning Outcome** | **Sem Hours** | **Date Met** |
| **+BIOL3310 Molecular Genetics w/lab** |  | **4** |  | **+BIOL4400 Immunology** |  | **3** |  |
| **BIOL/CHEM4120 Capstone Research II** |  | **1-2#** |  | **BIOL/CHEM4130 Capstone Research III** |  | **2** |  |
| Liberal learning course – Social Science § | GE3E | 3 |  | Liberal learning course - History § | GE3B | 3 |  |
| *BIOL3420 Human Anatomy* w/ lab **or** upper division elective § |  | 3-4 |  | *BIOL3440 Human Physiology with lab* **or** upper division elective § |  | 3-4 |  |
| LEAD4100 Life and Leadership Practicum I | LL | 2 |  | LEAD4200 Life and Leadership Practicum II | LL | 2 |  |
| **Total Hours** |  | **13-15** |  | **Total Hours** |  | **13-14** |  |
| **Notes:** Check in with your advisor during your senor year about career opportunities outside graduate programs, including opportunities for a gap year that help make you a more competitive graduate school applicant. #Capstone Research II and III can be taken for 1 **or** 2 credits depending on how robust of a project you and your mentor design. *If you are under 15 hours, consider taking an upper division elective course.* | | | | | | | |
| DISCLAIMER: These plans are to be used as guides only and are subject to changes in curriculum requirements. Refer to your Graceland Catalog for complete and accurate information. Some courses listed on the plans may have prerequisites that have not been stated. **The student has the ultimate responsibility for scheduling and meeting the graduation requirements**  .-For students planning to attend professional or graduate school, check with your graduate program of additional requirements (including anatomy physiology, nutrition, sociology and/or psychology course). Please meet with your faculty advisor to discuss.    -For students planning on attending medical school, PA school or dental school it is recommended to also take *BIOL3420 Human Anatomy* w/ lab and *BIOL3440 Human Physiology.*  -For students planning on attending veterinary school to also, take *BIOL3420, BIOL3440 and* **+***BIOL2430 Animal Biology*.  -For students whose graduate school contains a cadaver lab, a pottery course is highly recommended to fulfill their arts liberal learning course.  -For students looking to get a laboratory job is highly recommended to also take **+**CHEM3300 Analytical Chemistry and/or **+**CHEM4300 Instrumental analysis. | | | | | | | | |