

## **Bachelor of Science in Biomedical Science**

### **Introduction**

This program prepares graduates for entry into a variety of professional healthcare programs. The student is well prepared to compete successfully for admission to professional schools in medicine, chiropractic medicine, veterinary medicine, pharmacology and physician assistant programs as well as graduate studies in science and biomedical sciences. The biomedical sciences program prepares the student for careers in the business world that focus on biomedical processes. Biomedical science graduates will be well prepared for entrance into careers such as a pharmaceutical industry representative, medical equipment manufacturer's representative and laboratory support positions in both the biomedical and academic fields.

The biomedical sciences program offers individualized attention to students in the program. Small classes and personalized guidance by the faculty help each student achieve his or her goals in the biomedical field. Students are required to participate in a research course and project in an area of biomedical sciences that interests the student.

### **Mission Statement**

The mission of the Biomedical Sciences Program at JCHS is to prepare graduates with a solid foundation in the natural sciences, to inspire lifelong learning and to facilitate the acquisition of knowledge and necessary skills to enter graduate studies or the marketplace in the biomedical or healthcare field.

### **Program Outcomes**

Upon completion of the Biomedical Sciences program, graduates will be able to

1. demonstrate familiarity with a broad knowledge base of the natural sciences that includes human biology, chemistry and physics,
2. understand and apply basic concepts of research design, implement study design, perform analysis of data and interpret research findings,
3. demonstrate the use of critical thinking skills, skeptical inquiry and the scientific approach to problem-solving and reasoning,
4. demonstrate an understanding of the anatomical and physiological basis of human disease,
5. understand the function and mechanism of action of basic cellular processes,

6. understand the application of fundamental biochemical processes of normal cellular function and of abnormal function,
7. demonstrate familiarity with fundamental concepts of genetics, gene activation and aspects of protein production,
8. be well prepared for graduate studies or entry level employment in the biomedical field,
9. demonstrate effective professional communication and a commitment to lifelong learning.

### Academic Policies

In addition to those policies published in the JCHS Catalog and JCHS Student Handbook, students are expected to follow the program policies as published in the *Biomedical Sciences Handbook*. This handbook is available electronically on the program blackboard site and may be requested from the program secretary.

### Program Progression

An unsatisfactory evaluation is a final grade report of "D" or "F" in any Biomedical Sciences program specific course. Courses required by the Biomedical Sciences curriculum where a grade of at least "C" is required are:

BIO 211	Anatomy and Physiology I
BIO 212	Anatomy and Physiology II
BIO 253	Microbiology
BIO 312	Research Methodology
BIO 407	Seminar in Biology
BIO 410	Research

**Any BIO course used to meet the 40 credit hours BIO requirement.**

CHM 111	General Chemistry I
CHM 112	General Chemistry II
CHM 241	Organic Chemistry I
CHM 360	Biochemistry I

**Any CHM course used to meet the 20 credit hours CHM requirement.**

PHY 201	General Physics I
PHY 202	General Physics II
MTH 165	College Algebra
MTH 210	Introduction to Statistics <b>or</b>
MTH 301	Statistics for Healthcare

If a student in the Biomedical Sciences program receives a grade of D or F in a program-specific course (listed above), the student will be placed on

programmatic probation. The student will be required to repeat the course for which they received the unsatisfactory grade in order to improve their grade and in order to continue in the established curriculum. Until the student receives a satisfactory grade for the repeated course, the student will not be able to enroll in any additional courses for which that course is a prerequisite. **Please note that the accumulation of two unsatisfactory final grades (D or F) in any Biomedical Sciences program specific courses will result in dismissal from the Biomedical Sciences program (see JCHS Catalog for professional Program Probation).**

Students that have been dismissed from the Biomedical Sciences program may petition in writing for re-admission to the program. The petition for re-admission will be considered on an individual basis by the Program Director. (A student that petitions for re-admission to a program from which they have been dismissed must go through the College's general admission procedure for re-admission to the College if the student has not attended in 12 months or more.)

### **Biology Minor**

Required:

- A minimum of 17 hours, 9 of which must be earned at JCHS
- BIO 211/211L Anatomy and Physiology I
- BIO 212/212L Anatomy and Physiology II
- BIO 321/321L Gross Anatomy I
- 6 hours of BIO courses at 300/400 level

### **Medical Laboratory Science Concentration (MLS)**

Medical Laboratory Scientists are healthcare professionals who perform diagnostic testing, usually in a clinical laboratory setting. Our profession has previously been referred to as Clinical Laboratory Science and as Medical Technology. Students who successfully complete this program will qualify for a Bachelor of Science with a concentration in Medical Laboratory Science.

Students who wish to pursue this option must contact their faculty advisor to develop an appropriate, individualized plan of study that will satisfy the requirements of the College and of the Medical Laboratory Science Program. The Plan of Study **MUST** be approved by the Biomedical Sciences program director and the JCHS registrar in advance. Upon completion of this program, students will be granted credit for CLS 400A, B, & C Medical Laboratory Sciences.

**Students must apply and be accepted into the Medical Laboratory Science Program. JCHS does not guarantee acceptance into the MLS program.**

## Bachelor of Science in Biomedical Science Program of Study (127 credit hours)

The following plan of study is a sample plan of study. The actual order in which classes are taken may vary depending on transfer credit and course availability.

1. A minimum of 40 hours of BIO credit are required, including 20 credits from upper division courses (300 or 400 level courses)
2. A minimum of 20 hours of CHM credit are required.
3. A minimum of 40 hours of 300 or 400 level credits are required.
4. MTH 210 or MTH 301 is required in order to satisfy the Statistics requirement. IDS 302 will not be accepted.
5. A total of 127 hours are required for graduation.

PREFIX	COURSE TITLE	CREDITS
<b>Semester 1: Fall</b>		
BUS 131	Computer Concepts and Applications	3
CHM 111/111L	General Chemistry I	4
ELE (BIO)	Biology Elective	4
ENG 111	Grammar and Composition I	3
GEN 100	Academic Seminar	1
HPE 131	Physical Fitness and Wellness	1
<b>Total Credits:</b>		<b>16</b>
<b>Semester 2: Spring</b>		
CHM 112/112L	General Chemistry II	4
ELE (BIO)	Biology Elective	4
ENG 112	Grammar and Composition II	3
IDS 215	Bioethics	3
MTH 165	College Algebra (Math courses at the sophomore (200) level or above may be substituted. MTH 210 and MTH 301 do not meet this requirement)	3
<b>Total Credits:</b>		<b>17</b>
<b>Semester 3: Fall</b>		
BIO 211/211L	Anatomy and Physiology I	4
CHM 241/24L	Organic Chemistry I	4
ELE (ENG)	English Elective	3
SOC 213	Social Issues in Healthcare Delivery	3
PHY 201/201L	General Physics I	4
<b>Total Credits:</b>		<b>18</b>

PREFIX	COURSE TITLE	CREDITS
<b>Semester 4: Spring</b>		
BIO 212/212L	Anatomy and Physiology II	4
ELE (CHM)	Chemistry Elective	4
IPE 200	Fundamentals of Teamwork	1
MTH 210	Introduction to Statistics (or MTH 301)	3
PHY 202/202L	General Physics II	4
<b>Total Credits:</b>		<b>16</b>
<b>Semester 5: Fall</b>		
BIO 253/253L	Microbiology	4
CHM 360/360L	Biochemistry I	4
ELE (BIO)	Biology Elective	3
ELE (BIO)	Biology Elective	3
IPE 300	Interprofessional Healthcare Discovery & Collaboration	1
<b>Total Credits:</b>		<b>15</b>
<b>Semester 6: Spring</b>		
ELE (BIO)	Biology Elective	3
ELE (Soc Sc)	Social Science Elective (PSY 201, 202, or 238, or Intro to Sociology)	3
ELE	Elective	3
ELE	Elective	3
ELE	Elective	3
<b>Total Credits:</b>		<b>15</b>
<b>Semester 7: Fall</b>		
BIO 312	Research Methodology	3
ELE (BIO)	Biology Elective	4
ELE	Elective	3
ELE	Elective	3
ELE	Elective	3
IPE 400	Interprofessional Healthcare Experiences Lab	1
<b>Total Credits:</b>		<b>17</b>
<b>Semester 8: Spring</b>		
BIO 407	Seminar in Biology	1
BIO 410	Capstone Research	3
ELE	Elective	3
ELE	Elective	3
ELE	Elective	3
<b>Total Credits:</b>		<b>13</b>
<b>Total Credits:</b>		<b>127</b>
<b>Credits from Non-Science/Math Courses:</b>		<b>62</b>
<b>Credits from Interprofessional Education Courses:</b>		<b>3</b>
<b>Credits from Science/Math Courses:</b>		<b>62</b>