



PLTW - BIOMEDICAL INNOVATIONS

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Course Description: **Biomedical Innovations (18 weeks/ 2 credits/ grade 12)**

In this capstone course, students apply their knowledge and skills to answer questions or solve problems related to the biomedical sciences. Students design innovative solutions for the health challenges of the 21st century as they work through progressively challenging open-ended problems, addressing topics such as clinical medicine, physiology, biomedical engineering, and public health. They have the opportunity to work on an independent project and may work with a mentor or advisor from a university, hospital, physician's office, or industry. Throughout the course, students are expected to present their work to an adult audience that may include representatives from the local business and healthcare community. Students must have successfully completed the PLTW Biomedical courses: PBS, HBS, and MI to enroll in BI. All students are encouraged to actively participate in HOSA.

Culminating Product: Upon completion of this course, students will be prepared for further study in an array of health-related fields at the post secondary level or to enter the biomedical workforce.

Available Student Industry Credentials: BLS Instructor with Healthcare Provider, American Lifeguard Association Certification

CTSO: Students are encouraged to participate in HOSA. Competitive events that relate to a specific topic discussed in class will be highlighted. HOSA Competitive Event Guidelines will serve as a reference for these activities.

Course Objectives: The students will be able to:

1. Discuss ten Biomedical careers.
2. Explore biomedical careers through job shadowing during weekly clinical experiences.
3. Discuss the purpose, roles and responsibilities of each health care professional who works in an effective emergency department and other health care settings.
4. Participate in a group project to design an efficient and effective ED.
5. Demonstrate effective communication techniques..
6. Demonstrate employability skills.
7. Recognize ethical behavior and legal implications in the healthcare setting.
8. Utilize correct spelling, pronunciation, and usage of biomedical terminology.
9. Analyze clinical observations and findings using accurate medical terminology and following legal guidelines.
10. Demonstrate leadership skills and community service through clinical and HOSA involvement.



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Goals: To introduce students to the healthcare system.
To assist students in making realistic career decisions.
To develop students' leadership skills.
To prepare students for acceptance in postsecondary healthcare education programs and/or employment in healthcare positions.

Instructional Philosophy: This program supports and incorporates the mission of Bob Jones High School to educate and develop all students to their fullest potential. The belief is held that all students can learn by implementing teaching strategies for diverse learning styles, thereby enhancing lifelong learning. This program will provide opportunities for students to enhance their knowledge of health careers and allow them to visit potential places of employment. Students will be expected to meet the learning outcomes listed below and demonstrate understanding of the underlying concepts.

***Classroom
Expectations:***

You are expected to conduct yourself in a respectful and productive manner. In addition to all the rules and expectations listed in the student handbook, I expect you to have a positive attitude, treat others with respect, practice self-discipline, and demonstrate responsibility. If these conditions are not met, you can expect one-on-one meetings with me, parent/instructor conferencing, and administrative action, if necessary. Students will receive a grade each term for their professional behavior in class.

If a student is absent the 1 or 2 days before a scheduled test is given and there is no new material that has been presented during the absence, the student WILL BE expected to take the exam on the day it is scheduled.

Late work- Accepted with consequences:

Project -1 day late -15%, 2 days late -30%, 3+ days late -50%. Daily grade- Homework is due at the start of class. A deduction of 10% will be taken for each day late to a maximum of -50%.

Students will develop a portfolio of assignments and projects as the semester progresses. THIS IS A REQUIREMENT OF PLTW CERTIFICATION. Portfolios will be checked and graded intermittently. Students will also keep a laboratory manual. Students and parents must sign a Lab Safety contract before they may participate in any laboratory experiments. Students will wear lab coats, safety glasses, long pants and closed toed shoes on lab days.



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Classroom Management Plan:

Classroom Management Plan

- Verbal reprimand
- Conference with student with parent contact
- Withdrawal of privilege(s) with parent contact
- Other consequences determined to be reasonable and appropriate by the school administration.

Cell Phones

ALL electronic devices are prohibited to be used during the instructional day. This is from 8:12-3:28. This includes: cell phones, smart watches, earbuds/headphones/airpods, tablets, and personal computers (school issued laptops will be allowed). Discipline will be given to ANY student who uses an electronic device. If you bring your device to school, it **MUST** be placed in your bookbag. It cannot be on your person.

Numeracy Anchor Assignment: There are a variety of assignments throughout this semester's curriculum that demonstrate the importance of mathematics in a biomedical career.

Literacy Anchor Assignment: Technical reading and writing are a part of each day's activity in PLTW. Students log into the online curriculum and complete their own self-paced research utilizing the resources provided. Each activity also includes reflection and conclusion questions related to the knowledge obtained that day.

Grading Policy: Major assessments will count 70 percent of your grade. Homework and classwork will account for 30 percent of your grade. Grades will be updated weekly in PowerSchools. Each grading period will consist of nine weeks.

Make-up Work Policy:

Make-up tests will **only** be given to a student who has an **excused absence**. **The student must make arrangements with the teacher to take a make-up test. Tests may be taken during Patriot Path with prior arrangement from each teacher.** A student only has two chances (the next two Patriot Paths after the absence) to make up a test. All make-up tests will be administered in the designated classroom on the Patriot Path session roster.

Homework/Classwork: Students who are absent for **excused reasons** will be permitted to make up missed work. **It is the student's responsibility to get their work assignments the day upon return to school and complete the assignments according to a time frame determined by the teacher within two weeks of the date of the last absence.** Grades of zero will be assigned for assignments missed because of unexcused absences.



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***Text and Other
Required
Reading:***

Project Lead the Way Online Curriculum
Other Supplemental Resources

***Materials and
Supplies Needed:***

White leather closed toe shoes, scrubs, wrist watch with second hand (not digital), 2-inch Binder with loose-leaf paper, composition notebook, small notebook for clinical, black pen, highlighter, no. 2 pencil, 9 dividers, box of Kleenex, and roll of paper towels (box of Kleenex and roll of paper towels are optional but appreciated..

Laptops

Concerning laptop utilization: 1. Student laptops should not be hard-wired to the network or have print capabilities. 2. Use of discs, flash drives, jump drives, or other USB devices will not be allowed on Madison City computers. 3. Neither the teacher, nor the school is responsible for broken, stolen, or lost laptops. 4. Laptops and other electronic devices will be used at the individual discretion of the teacher.

***Turnitin Notice
(English Courses)***

The majority of writing assignments in this course will be submitted to Turnitin via the Schoology learning platform. Turnitin generates a report on the originality of student writing by comparing it with a database of periodicals, books, online content, student papers, and other published work. This program will help students discern when they are using sources fairly, citing properly, and paraphrasing effectively - skills essential to all academic work.

Students will have the opportunity to review their Turnitin originality report and will have the opportunity to make revisions before submitting their work for grading. Once their work is submitted, teachers have the opportunity to view the student/s originality report and grade accordingly.

Accommodations

Requests for accommodations for this course or any school event are welcomed from students and parents.



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18 – WEEK PLAN	
Week 1	Orientation to Course; Problem 1: Design of an Effective Emergency Room Activity 1.1.1, 1.1.2, and 1.1.3 Skills lab
Week 2	Problem 1: Design of an Effective Emergency Room Activity 1.1.4 Skills lab
Week 3	Problem 2: Exploring Human Physiology Activity 2.1.1, 2.1.2, 2.1.3 Skills lab
Week 4	Unit 2: Exploring Human Physiology Activity 2.1.3, 2.1.4 Skills lab
Week 5	Problem 3: Design of a Medical Innovation Activity 3.1.1, 3.1.2, 3.1.3 Skills lab
Week 6	Problem 3: Design of a Medical Innovation; Activity 3.1.3 Problem 4: Investigating Water Contamination; Activity 4.1.1, 4.1.2, 4.1.3 Clinical
Week 7	Problem 4: Investigating Water Contamination; Activity 4.1.4, 4.1.5 Problem 5: Combating a Public Health Issue; Activity 5.1.1 Clinical
Week 8	Problem 5: Combating a Public Health Issue Activity 5.1.1, 5.1.2, 5.1.3 Clinical
Week 9	Problem 5: Combating a Public Health Issue; Activity 5.1.3 Problem 6: Molecular Biology in Action; Activity 6.1.1, 6.1.2 Clinical
Week 10	Problem 6: Molecular Biology in Action Activity 6.1.2 Clinical
Week 11	Problem 6: Molecular Biology in Action Activity 6.1.2 Clinical
Week 12	Problem 6: Molecular Biology in Action Activity 6.1.2, 6.1.3 Clinical
Week 13	Problem 6: Molecular Biology in Action Activity 6.1.3
Week 14	Problem 6: Molecular Biology in Action; Activity 6.1.3 Clinical Problem 7: Forensic Autopsy; Activity 7.1.1
Week 15	Problem 7: Forensic Autopsy



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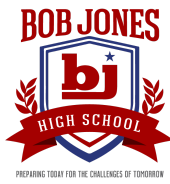
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	Activity 7.1.1, 7.1.2 Clinical
Week 16	Problem 8: Independent Project Activity 8.1.1, 8.1.2, 8.1.3 Clinical
Week 17	Problem 8: Independent Project Activity 8.1.4, 8.1.5, 8.1.6 Clinical
Week 18	Problem 8: Independent Project completion and presentation Final Project

***This is a tentative plan and may change at the discretion of the teacher.**

Healthcare Provider Skills taught in the course-Depends on if in classroom or virtual

- Personal Protective Equipment – donning and doffing
- CPR and First Aid Certification
- Bed making
- Patient Transfer
- Vital Signs – pulse, blood pressure, respirations, temperature
- Dietary analysis
- X-Ray Analysis of bone fractures
- HIPAA
- Standard Precautions / Handling of blood borne pathogens / Isolation
- Handwashing
- Suturing
- Two Patient Identifiers
- Recognizing and reporting abuse
- Legal and Ethical Behaviors and Responsibilities
- Patient Rights
- Advanced directives
- Fire Safety
- Body Mechanics
- Wheelchair / Stretcher / Side Rail Safety
- Hazardous Materials



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Please sign below to acknowledge that you have received, read, and understood the syllabus.

Student name: _____

Student signature: _____

Parent/guardian name: _____

Parent/guardian signature: _____

Parent/guardian, please provide two ways for me to contact you (email address, phone numbers):

Parent/guardian Email:

Parent/Guardian Phone number:
