



## PLTW Medical Intervention

### Course Syllabus

Instructor Ms. Ninfa Matiase M.Ed.

[Ninfa.Matiase@slps.org](mailto:Ninfa.Matiase@slps.org)

Yearlong course 2024- 25 School year

1 High school Credit

3 College credits, Through St louis Community College

Equivalent to BIO 104

### Office hours:

Tuesday 3:30 p.m. - 5:15 p.m. (Subject to change due to covid-19)

### Tutoring:

Wednesday during planning time (subject to change due to covid-19)

### ***Coronavirus (COVID-19) Information***

Students must be prepared for any, and all, classes to be moved online in response to changes in the coronavirus status. Please visit the [COVID-19 website](#) for the latest update. If you are sick Please stay home I will record the lessons and post them in teams

### Course Description

In the Medical Intervention course, students will investigate the variety of interventions involved in the prevention, diagnosis and treatment of disease as they follow the lives of a fictitious family. A “How-To” manual for maintaining overall health and homeostasis in the body, the course will explore how to prevent and fight infection; how to screen and evaluate the code in our DNA, how to prevent, diagnose and treat cancer, and how to prevail when the organs of the body begin to fail. Through these scenarios, students will be exposed to the wide range of interventions related to Immunology, Surgery, Genetics, Pharmacology, Medical Devices, and Diagnostics. Each family case scenario will introduce multiple types of interventions and will reinforce concepts learned in the previous two courses, as well as present new content.

Interventions may range from simple diagnostic tests to treatment of complex diseases and disorders. These interventions will be showcased across the generations of the family and will provide a look at the past, present and future of biomedical science. Lifestyle choices and preventive measures are emphasized throughout the course as well as the important roles scientific thinking and engineering design play in the development of interventions of the future.

### **CO-Curricular Opportunity:**

Students in our biomedical sciences program are highly encouraged to become members of our student organization called HOSA Future Health professionals. HOSA is considered to be “co-curricular” to the biomedical program and the class will incorporate lessons and leadership

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training related to HOSA. Additionally, members in HOSA are eligible to attend and compete at the State and National Leadership Conferences. Why join HOSA? Becoming a part of the quickest expanding organization in the fastest growing career field is nothing but beneficial to the students that choose to get involved. HOSA truly is healthcare training for students that have the desire to enter medicine. Competitive events featured at conferences include knowledge and skills that are sure to be seen again in future education. Offering internships and scholarships, HOSA also gives members the chance to connect to health professionals that they aspire to be like one day. Additionally, leadership and communication skills are vital to success in any career, and HOSA provides just that. With symposiums by prosperous entrepreneurs, professional leadership developers, and eloquent public speakers, HOSA hands you all the tools necessary to be successful in whatever you choose to do.

### ***Technology Requirements***

- Your **my.stlcc.edu** student e-mail account is official means of communication with St. Louis Community College. All communication from the college to students will be sent to my.stlcc.edu student e-mail.
- Communications at collegiate will be done via TEAMS
- Technology requirements for the course,
  - Microsoft Office products,
  - TEAMS
  - PLTW access.
  - All students have free access to Microsoft 365 through their MySTLCC account, which includes software such as Word, PowerPoint, Excel, OneDrive, a calendar, and e-mail. See the link [STLCC Student Email and Office 365](#) for more information.

**REFERENCES:** This course was developed by **Project Lead the Way, Inc.** and all materials and information originated from their curriculum development. **NO materials from this course may be posted or shared online. If you post any material online you will be subjected to disciplinary actions**

### ***Topics to be covered:***

- How to fight infection: virology, microbiology, audiology, epidemiology
- How to screen what is in your genes: molecular genetics, prenatal screening, gene therapy, bioethics
- How to conquer cancer: oncology, biostatistics, prosthetics, nanotechnology
- How to prevail when organs fail: genetic engineering, organ transplantation, bio-manufacturing

### ***Expectations:***

Students are expected to meet all the course goals by demonstrating their understanding of the basic concepts of each topic area.

All students will take an end of course exam administered in May

All students will the Laboratory assistant credentialing exam BACE in May

## **HAWKS - Honest, Accountable, Welcoming, Knowledgeable, School-Spirited**

### **Delivery Method:**

Instruction will consist of individual hands-on activities and projects, group work, lecture, discussion, reading, writing, self-assessment, and heavy use of technology.

### **Assessments:**

Students will be graded on the following items: presentations, written reports, tests, daily work, group work, and individual projects.

### **Required Materials:**

In order to be successful in this class, you will need the following materials daily. Please let me know **IMMEDIATELY** if you will have difficulty getting any of the materials and I will find a way to help you get what you need:

- Laboratory Notebook
- 2 inch 3-ring binder
- Dividers
- Notebook Paper (College Ruled preferred)
- Pencils
- Blue or Black Pen
- Colored Pencils
- Graph paper
- Laptop computer (school provided)
- Post it notes

### **Diversity & Inclusion, Non-Discrimination Statement**

St. Louis Community College is committed to creating inclusive, welcoming, and respectful learning and working environments focused on the needs of our diverse communities. The College does not discriminate based on race, color, national origin, ancestry, religion, sex, pregnancy, sexual orientation, gender identity, gender expression, age, disability, protected veteran status, and any other status protected by applicable state or federal law. The College's Nondiscrimination policies apply to any phase of its employment process, any phase of its admission, or financial aid programs, and all its educational programs or activities.

Student inquiries concerning discrimination or harassment, and the procedure for complaints of discrimination or harassment may be made to: Mary Zabriskie, Director, Student Conduct/Title IX Coordinator, 314-539-5345, mzabriskie@stlcc.edu.

### **Disability Resources and Access Office Information**

STLCC is committed to providing all students equal access to learning opportunities. Access Office staff, available on each campus, work with students who have disabilities to provide and/or arrange academic accommodations. Students who have, or think they may have, a disability are encouraged to contact the campus Access Office:

- Florissant Valley: 314-513-4551 or [FVAccess@stlcc.edu](mailto:FVAccess@stlcc.edu)
- Forest Park & Harrison Center: 314-644-9039 or [FPAccess@stlcc.edu](mailto:FPAccess@stlcc.edu)
- Meramec & South County: 314-984-7673 or [MCAccess@stlcc.edu](mailto:MCAccess@stlcc.edu)
- Wildwood: 636-422-2000 or [WWAccess@stlcc.edu](mailto:WWAccess@stlcc.edu)
- Online: 314-513-4771 or [SFoster@stlcc.edu](mailto:SFoster@stlcc.edu)

Students with academic accommodations are responsible for providing their professors with Instructor Memos and should do so early in the course. For more information, see [Access services](https://www.stlcc.edu/student-support/disability-services/) (<https://www.stlcc.edu/student-support/disability-services/>).

## Title IX

Discrimination includes any form of unequal treatment on the basis of sex, sexual orientation or gender expression such as denial of opportunities, harassment, and violence. Sex based violence includes sexual assault, sexual harassment, dating violence, domestic violence and stalking. If you experience discrimination in any of these forms, you are encouraged to report the incident to the Title IX Coordinator, or campus-based Title IX Investigators. To learn more, including information on campus and community resources, go to [STLCC's Sexual Misconduct Policy](https://www.stlcc.edu/docs/policies-and-procedures/sexual-misconduct-guidelines.pdf) (<https://www.stlcc.edu/docs/policies-and-procedures/sexual-misconduct-guidelines.pdf>).

## Classroom Policies

The following policies will be in place throughout the course of the year. Electronic devices

- **Personal Phones may not be used**
- Electronic devices such as smartphones will be permitted for use in class **WHEN THE TEACHER SAYS IT IS ACCEPTABLE phones must be put away at all times!**
- ALL Electronic Devices will be confiscated if they especially if become a distraction in class. Students may pick up their device after class. If a student's electronic device becomes a chronic issue the device will be collected and turned into the administrator

## Late work

**Late work will need to be submitted within 7 days of its official due date; this does include weekends. The penalty is 20% as per school wide policy.**

## Attendance

The key to your success in medical interventions is attending class each day. If you experience absences, you will fall behind and need to spend time after school to catch up.

It is my expectation that you are in your desk working on the daily do now by the time class begins

## Tutoring

If a student would like extra help on an assignment or is having difficulty with the current topic, s/he may come in for tutoring after school. Remember it is your responsibility to seek help, I will make myself available to you should you need additional help.

## Student Conduct

Students are expected to behave as adults. Behavior that is disruptive to the learning environment will not be tolerated. The following consequences will be implemented.

- First Instance – Verbal reminder \*
- Second Instance – Parent/Guardian contact \*
- Third Instance – Administrative referral and loss of extra credit points
- Depending on the severity of the behavior, administrative referral may be prior to the third instance.
- Profanity will not be tolerated.

**Absolutely no food or drink (except water) in a closed container**

**Classroom environment**

All individuals have a right to an educational environment free from bias, prejudice and bigotry. As members of the Collegiate School of Medicine and Bioscience educational community, students are expected to refrain from participating in acts of harassment that are designed to demean another student’s race, gender, ethnicity, religious preference, disability or sexual orientation.

**\*\*\* All school rules and consequences in the student handbook will be enforced\*\*\***

**Grading**

**Semester grades will be calculated as follows:**

- |  |             |
|--|-------------|
| <b>1. Labs</b>                         | <b>30%</b>  |
| <b>2. Writing assignments/do now’s</b> | <b>10%</b>  |
| <b>3. Test</b>                         | <b>40%</b>  |
| <b>4. Projects/quizzes</b>             | <b>20%</b>  |
| <b>5. Total</b>                        | <b>100%</b> |

**a. The above formulas as shown will calculate progress grades and termgrades ONLY**

6. Final semester grades calculation

- a. 20% Final exam**
- b. 80% 3rd term grade for first semester or 4th term grade or second semester**

**Grading Scale**

<b>Grade</b>	<b>Scale</b>	<b>Description of Work</b>
<b>A</b>	<b>90-100%</b>	Consistently demonstrates an exceptional level of quality and effort. Having all work in on time and completed to exceed expectations. Mastery in evaluating, synthesizing, and applying the knowledge.
<b>B</b>	<b>80-89%</b>	Consistently demonstrates proficient knowledge with a good effort and quality of work. All assignments are complete and on time. Demonstrates the ability to evaluate, analyze, synthesize and apply the principles.

<b>C</b>	<b>70-79%</b>	Demonstrates proficient knowledge and the ability to apply knowledge. Work shows average effort. A few assignments may be missed or late.
<b>D</b>	<b>60-69%</b>	Work shows minimal effort, and some assignments are late. Demonstrates a basic understanding of recalling or comprehending knowledge
<b>F</b>	<b>Below 59%</b>	Understanding is below basic. Work is of poor quality and does not meet standards or expectations.

## School year at a glance

### Unit 1: How to Fight Infection (± 40 Days subject to change)

<b>Lesson 1.1: The Mystery Infection (14 Days)</b>		
	Activity 1.1.1 – Medical Interventions Inventory	Student Goal:
	Activity 1.1.2 – Investigating an Outbreak	
	Activity 1.1.3 – Using DNA to Identify Pathogens	
	Lab 1.1.5 – ELISA	
	Activity 1.1.6 – Final Diagnosis	
<b>Lesson 1.2: Antibiotic Treatment (9 Days)</b>		
	Activity 1.2.1 – Antibiotic Therapy	Student Goal:
	Lab 1.2.2 – Which Antibiotic is the Best Choice?	
	Lab 1.2.3 – Attack of the Superbugs	
	Activity 1.2.4 – When Antibiotics Fail	
<b>Lesson 1.3: The Aftermath: Hearing Loss (9 Days)</b>		
	Activity 1.3.1 – Good Vibrations	Student Goal:
	Lab 1.3.2 – Can You Hear Me Now?	
	Activity 1.3.3 – Cochlear Implant Debate	

<b>Lesson 1.4: Vaccination (8 Days)</b>		
	Activity 1.4.1 – Disease Prevention Through Vaccination	Student Goal:
	Activity 1.4.2 – Vaccine Development	
	Activity 1.4.3 – Life of an Epidemiologist	

## **Unit 2: How to Screen Your Genes (± 21 Days subject to change)**

<b>Lesson 2.1: Genetic Testing and Screening (15 Days)</b>		
	Activity 2.1.1 – Chronicles of a Genetic Counselor	Student Goal:
	Lab 2.1.2 – Copying Our Genes	
	Lab 2.1.3 – Testing Your Own Genes	
	Activity 2.1.5 – Maternal and Child Health	
<b>Lesson 2.2: Our Genetic Future (6 Days)</b>		
	Activity 2.2.1 – Gene Therapy	Student Goal:
	Activity 2.2.2 – Reproductive Technology	

## **Unit 3: How to Conquer Cancer(±52 Days Subject to change)**

<b>Lesson 3.1: Detecting Cancer (14 Days)</b>		
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	Activity 3.1.1 – Who is Affected by Cancer?	Student Goal:
	Activity 3.1.2 – Diagnostic Imaging	
	Activity 3.1.3 – When Cells Lose Control	
	Lab 3.1.4 – DNA Microarray	
	Activity 3.1.5 – Unlocking the Secrets in Our Genes	

### **Lesson 3.2: Reducing Your Risk (14 Days)**

	Activity 3.2.1 – Am I at Risk?	Student Goal:
	Lab 3.2.2 – Skin Cancer Prevention	
	Lab 3.2.3 – Breast Cancer Screening and Prevention	
	Activity 3.2.4 – Virology	
	Activity 3.2.5 – Routine Screenings	

### **Lesson 3.3: Treating Cancer (11 Days)**

	Activity 3.3.1 – Diary of a Cancer Patient	Student Goal:
	Lab 3.3.2 – Biofeedback Therapy	
	Lab 3.3.3 – Rx – Design of Prosthetic Arm	
	Activity 3.3.4 – Occupational and Physical Therapy Careers	



<b>Lesson 3.4: Building a Better Cancer Treatment (13 Days)</b>		
	Activity 3.4.1 – Precision Medicine	Student Goal:
	Activity 3.4.2 – Nanofuture	
	Activity 3.4.3 – Clinical Trials	
	Activity 3.4.4 – Tiny Treatments	

## **Unit 4: How to Prevail When Organs Fail (±39 Days subject to change)**

<b>Lesson 4.1: Manufacturing Human Proteins (14 Days)</b>		
	Activity 4.1.1 – All About Insulin	Student Goal:
	Lab 4.1.2 – Protein Factories	
	Lab 4.1.3 – Protein Purification	
	Activity 4.1.5 – Careers in Biomanufacturing	

<b>Lesson 4.2: Organ Failure (2 Days)</b>		
	Activity 4.2.1 – Medical Detectives	Student Goal:

<b>Lesson 4.3: Transplant (14 Days)</b>		
	Activity 4.3.1 – Who Should Receive the Organ?	Student Goal:
	Lab 4.3.2 – Finding a Match	
	Activity 4.3.3 – Kidney Donation	
	Lab 4.3.4 – You Be the Surgeon	
	Activity 4.3.5 – Transplant Team	
	Activity 4.3.6 – Are All Transplants the Same?	

<b>Lesson 4.4: Building a Better Body (9 Days)</b>		
	Project 4.4.1 – Replacement Parts	Student Goal:
	Project 4.4.2 – Bionic Human	
	Problem 4.4.4 – Putting it All Together	

