

 **Medical Interventions Syllabus**

 **Central Academy of Technology and Arts**

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Welcome to Project Lead the Way and the Biomedical Sciences Program! Project Lead the Way is a national, not-for-profit educational program that assists high-school students in developing strong backgrounds in science and engineering. The following is the link to Project Lead the Way online for more information: <http://www.pltw.org/Biomedical/biomedical.cfm>.

## **Course Description:**

In the Medical Interventions 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

role scientific thinking and engineering design play in the development of interventions

of the future.

**What does it mean to take a Project Lead the Way course?**

 The teacher proposes essential questions for the students to think about before each activity. Each student reads a short introduction to the activity that presents important information and vocabulary words necessary for completion of the activity. Each activity is hands-on learning approach that emphasizes critical thinking, creativity, innovation and real-world problem solving. Students are exposed to methods of researching, processing, and organizing information. Most importantly students learn how to take an active role in learning that has been proven to prepare students for a post-secondary training and career success in STEM-related fields. Students conclude activities with questions that summarize key learning objectives and prepare them for future activities. There are no textbooks in the Biomedical Sciences program. Students learn by lab experiments, group activities, lab analysis, and research.

## **Medical Interventions Topic Summaries:**

**Unit 1**

Students are introduced to Sue Smith, the eighteen-year-old daughter of Mr. and Mrs.

Smith. Sue is a college freshman who is presenting symptoms of an unknown infectious

disease which students eventually identify as bacterial meningitis. Sue survives the

infection, but is left with hearing impairment. Through this case, students will explore the

diagnostic process used to identify an unknown infection, the use of antibiotics as a

treatment, how bacteria develop antibiotic resistance, how hearing impairment is

assessed and treated, and how vaccinations are developed and used to prevent

infection.

**Unit 2**

Students are introduced to Mr. and Mrs. Smith, the head of the Smith family. Mr. and

Mrs. Smith are very excited because they just found out they are expecting a new baby.

Because the couple is in their early 40s, the doctor has suggested genetic screening

and testing. Through this case, students will explore how to screen and evaluate the

code in our DNA, the value of good prenatal care, and the future of genetic technology.

**Unit 3**

Students are introduced to Mike Smith, the sixteen-year-old son of Mr. and Mrs. Smith.

Mike is diagnosed with osteosarcoma, a type of bone cancer that often affects

teenagers. Mike’s treatments put him into remission; in order to remove all of the

cancerous tissue, he had to have most of his arm amputated and he needs a

prosthesis. Through this case, students will explore the diagnostic process used to

determine the presence of cancerous cells, the risk factors and prevention of cancer,

rehabilitation after disease or injury, and the design process for new medications,

prosthetics, and nanotechnology.

**Unit 4**

Students are introduced to Mrs. Jones, the forty-four-year-old sister of Mrs. Smith. Mrs.

Jones has been struggling with Type 1 Diabetes Mellitus for twenty years. Over the

years, Mrs. Jones did not take good care of herself or properly control her diabetes. She

eventually began using an insulin pump and changed her lifestyle to regulate her blood

sugar levels, but the damage had already been done. Mrs. Jones is now dealing with

end stage renal failure and needs a kidney transplant. Through this case, students will

explore protein production, blood sugar regulation, dialysis, organ donation and

transplantation, non-invasive surgery techniques, as well as creation of a bionic human.

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**Textbook: None – curriculum is online with very strict copyright laws and is password protected. Students will be given individual username and passwords.**

**Materials:** 3-ring binder (1.5-2 inch) with dividers, notebook paper, pencils, pens, index cards and highlighters

**Notebook:**

Students are required to keep and maintain a notebook for this class. The notebook should be a three-ring binder (1.5-2 inch). It is my advice to use only one binder for this class and not share it with any other classes. The notebook will be set up as part of the first activity for the class.

**Grades:**

The following scale will be used to determine grading.

40%- Tests

30%- Projects/ Presentations

20%- Quizzes, Classwork (Activities), and Lab Participation

10%- Lab Conduct, Safety and Homework

 **Grading Scale**

|  |  |
| --- | --- |
| 100-90 | A |
| 89-80 | B |
| 79-70 | C |
| 69-60 | D |
| 59-0 | F |

**Tutoring**I am available for tutoring before school (8:00am-8:30am), during 3rd block planning (12:00pm-2:00pm), or after school by appointment only.

**Academic Integrity**

Do not copy another student’s work even if you are assigned a partner or in groups. Copying, or copying and pasting material from online or elsewhere is absolutely not acceptable and constitutes academic dishonesty, or plagiarism. Assignments should not contain the same wording. Critical thinking is the main goal. A grade of a **0** will be given on any work a student submits if it is not completely his or her work and parents will be notified. The student whose name appears on the work must have completed the entire assignment.

**Dress Code Recommendation:**

Closed toe shoes, capri/long pants are **required** for your safety in lab activities. Hair will need to be up when working with bunson burner and chemicals. Each student will be provided personal protective equipment depending on the lab experiment such as goggles or gloves.

**Attendance/Tardiness**:

Students are expected to attend and be on time for each and every class. Students who are late to class must present a pass in order to enter.

**Assessments and Assignments**Students will be assessed through group projects, labs, quizzes, unit tests and classwork activities. PLTW curriculum is self-paced with multi-step daily activities. These activities require great attention to detail and encourage self-guided exploration of resource links. To be successful in a PLTW class, the student will be learn to take responsibility as an independent learner.

**Late Work**:

Homework, projects, lab assignments, and etc. are due at the beginning of class on the assigned due date. Late work will be docked 10 points each day with a “**0”** given on day 3.

**Make-up Work:**

**It is the student’s responsibility to find out what material and work that was missed on days they were absent**. If you are absent due to illness on the day that homework is due, you are expected to hand in the work as soon as you return. **If you are absent due to a field trip, all work is still due the assigned day.** It is up to students to arrange times for make-ups if they are absent for tests, quizzes, or labs. Students will be given advanced notice of upcoming tests, therefore students are expected to be prepared to make up missed test and quizzes.

**Classroom Procedures**

Students should ask permission to leave the room. If students are granted permission to leave the room they should take a hall pass. Students should practice time management and return as quickly as possible. Students who arrive late should have a tardy pass to enter class. Students will be held accountable to the **UCPS** Behavior Policies and **UCPS** Student Handbook.

**Classroom Expectations**

1. **Come to class!**
2. Bring all classroom materials and a **good attitude** to class with you each day.
3. **Be ready** to learn when the bell rings.
4. **Respect** yourself, your teacher, your classmates, and your school.
5. Wear your **safety equipment** at all required times.
6. Do not speak out of turn. **Raise your hand** if you would like to speak.
7. Remain in seat until the teacher dismisses you.
8. **No food, drink, candy, or gum in the lab!**
9. **Display personal integrity at all times –** Be honest and do not plagiarize.
10. Pull your own weight always being a good listener and following directions.
11. Never **talk** while **I’m** talking**!**

**Consequences of Non-compliance**

1. Verbal Warning
2. Parent notification
3. Administrative involvement

Immediate parent phone call or referral to Principal/Assistant Principal may be needed for extreme disrespect, cheating, fighting, profanity, disruptions and for alcohol/tobacco offenses.

Remember, safety in the laboratory setting is number one. Students please read the Central Academy of Technology and Arts Laboratory Contract and sign below that you have read it. We will have a great semester!

**MI Syllabus Contract**

Please sign and return to Ms. Turner by Friday, September 2, 2016.

I have read the syllabus and understand the way that I will be graded and the expectations that are set forth for me and all students in this class.

Student Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Parent/Guardian Email: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Parent Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_