



Grandview High School

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Medical Interventions Syllabus

Course Description

In the Medical Interventions (MI) 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.

Course Content

Unit One – How to Fight Infection

Sue Smith is a college freshman who is presenting symptoms of an unknown infectious disease, which you will need to identify. Sue survives the infection but is left with hearing impairment. Through this case, you 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 Two – How to Screen What Is In Your Genes

Mr. and Mrs. Smith – Sue Smith’s parents - 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, you 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 Three – How to Conquer Cancer

Mike Smith – Sue’s brother - 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, you 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 Four – How to Prevail When Organs Fail

Mrs. Diana Jones, the 40-year-old sister of Mrs. Smith, 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, and now Diana is experiencing some strange symptoms. 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.

Course Goals Students will:

- think critically and problem solve
- write scientifically and analyze scientific writing
- master technology skills including internet, presentation & spreadsheet software, and other computer programs
- master relevant lab skills using proper lab equipment
- use proper medical terminology
- gain a deeper understanding of the Biomedical Sciences field including content and career aspects through HOSA.

Future Health Professionals, formerly known as Health Occupations Students of America (HOSA), is a national career and technical student organization endorsed by the U.S. Department of Education and the Health Science Technology Education Division of Association for Career and Technical Education. HOSA is a great opportunity for **PBS** students to use the skills they learn to compete at the state and international level. In HOSA, students will volunteer on and off campus as well as implement awareness campaigns for the student body. There is a \$30 membership fee, which includes state and national memberships, and competition testing materials. HOSA t-shirts are \$20. Students have an option to only pay HOSA membership fees for \$30 or pay the membership fee and purchase a t-shirt for \$50. Please make checks payable to GHS HOSA. HOSA membership is not a requirement for MI.

Required Course Materials

- Three ring binder with tabbed dividers
- Pen/Pencil
- Laboratory Journal – spiral notebook or composition book (separate from your class binder)
- Recommended: USB / Flash Drive (for saving work on our laptops)

Course Policies

Attendance / Absences / Makeup Work: You must arrange, within one week of your return, to make up class work, tests, quizzes, and laboratory work missed due to documented, excused absences. Make a point of talking to me about your situation so that we're both on the same page!

Unexcused or undocumented absences will result in a zero for missed classwork assignments, which may not be made up.

Take responsibility for your work - it is up to YOU to get your make up work - not for me to give it to you.

Classroom Rules / Expectations :

- Be on time and ready to learn
- Be your best self
- Be respectful

- Be responsible

By Permission:

- Food/drink
- Cell phones
- Headphones

Assignment Policy: All class assignments will be submitted online using the course website on **Canvas**. Late work will receive only partial credit (after the FIVE day rule), and you are **expected** to keep up-to-date on your work and **be aware of all due dates**. Cheating will not be tolerated and will result in a zero on that assignment (for both the copier and anyone who allows the other to copy).

Grading Policy & Distribution

- **Assessment** - 45% (lab report, quizzes, exams)
- **Activities**- 30% - (labs, projects)
- **Assignments**- 15% (classwork and homework)
- **Participation**- 10% (entry task, exit task, leadership, discussion)

4 (A)= 93-100 3.7 (A-) = 90-92.99

3.3 (B+) = 87-89.99 3 (B) = 83-86 2.7 (B-) = 80-82.99

2.3 (C+) = 77-79.99 2 (C) = 73-76.99 1.7 (C-) = 70-72.99

1.3 (D+) = 67-69.99 1 (D) = 60-66.99 F- Failing is not an option

Earning College Credit Students enrolled in this course will have the opportunity to earn college credit from several colleges and universities if they earn no grade lower than a “C”, maintain at least a 3.0 GPA in the 4 PLTW courses, and earn at least a score of 6 on the PLTW End Of Course Assessment. All students are required to take the MI EOC test, which is administered online through the PLTW website.