# Medical Interventions Course No. 14105 Credit: 1.0

|  |  |  |  |
| --- | --- | --- | --- |
| **Student name:** |  | **Graduation Date:** |  |

Pathways and CIP Codes:Biomedical (14.0501); Health Science (51.9999)

Course Description: **Technical Level:** Students explore and identify the wide area of medical interventions and how health care professionals and researchers have identified causes and solutions to improve overall public healthcare. Such practitioners in allied health, dentistry, midwifery (obstetrics), medicine, nursing, optometry, pharmacy, psychology, and other health professions are all involved in medical interventions. Students will explore such areas at infections, genes, cancer, organ failure, immunization, transplants, blood types, medical drugs, legal issues in health care, emerging technology, careers that use medical interventions, and safety.

Directions:The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.

**RATING SCALE:**

4. Exemplary Achievement: Student possesses outstanding knowledge, skills or professional attitude.

3. Proficient Achievement:Student demonstrates good knowledge, skills or professional attitude. Requires limited supervision.

2. Limited Achievement:Student demonstrates fragmented knowledge, skills or professional attitude. Requires close supervision.

1. Inadequate Achievement:Student lacks knowledge, skills or professional attitude.

0. No Instruction/Training:Student has not received instruction or training in this area.

## Benchmark 1: Understanding Infection

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | List medical interventions to create a classroom display. |  |
| 1.2 | Illustrates connections between individuals in a disease outbreak. |  |
| 1.3 | Calculate serial dilutions and calculate resultant concentrations. |  |
| 1.4 | Describe the applications of bioinformatics in health and wellness. |  |
| 1.5 | Explain how bacteria can be identified using their DNA sequences. |  |
| 1.6 | Propose a plan to treat patients in an outbreak as well as prevent future spread. an outbreak as well as prevent. |  |
| 1.7 | Draw and label a diagram of a bacteria cell. |  |
| 1.8 | Explain the importance of taking antibiotics as described and infer the results of not taking antibiotics as prescribed. |  |
| 1.9 | Create a model of the structure of the ear. |  |
| 1.10 | Explain what causes hearing loss. |  |
| 1.11 | Recommend appropriate interventions for particular types of hearing loss. |  |
| 1.12 | Explain how sound waves are produced, travel and are interpreted by the ear. |  |
| 1.13 | Summarize how vaccines work. |  |
| 1.14 | Explain what recombinant DNA is and why it is important to vaccine creation. |  |

## Benchmark 2: Understand genes and genetics

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Show how the process of PCR amplifies a specific gene amplifies a specific gene. |  |
| 2.2 | Interpret gel electrophoresis results to determine genotype. |  |
| 2.3 | Predict how restriction enzymes will cut DNA based on single nucleotide polymorphisms (SNPs) at restriction sequences. |  |
| 2.4 | Compare amniocentesis and chorionic villus sampling. |  |
| 2.5 | Explain how gene therapy can treat a genetic disorder. |  |
| 2.6 | Debate the safety and overall effectiveness of gene therapy. |  |
| 2.7 | Describe medical interventions available to parents who wish to choose the gender of their next child. |  |
| 2.8 | Outline the process of reproductive cloning. |  |

## Benchmark 3: Understand terms and concepts about cancer

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 3.1 | Describe the differences in the appearance of normal cells and cancer cells. |  |
| 3.2 | Describe the different uses for X- rays, CT scans, and MRIs. |  |
| 3.3 | Describe the potential risk factors for different types of cancer as well as the ways to reduce the risks. |  |
| 3.4 | Outline the various cancer screenings they should have performed throughout their lives. |  |
| 3.5 | Consider the implications of genetic tests that detect hereditary breast cancer. |  |
| 3.6 | Describe the differences between chemotherapy and radiation. |  |
| 3.7 | Describe how specific chemotherapy drugs interact with and destroy cancer cells. |  |
| 3.8 | Explain how SNP (Single- nucleotide polymorphism) profiles may factor in to the decision to prescribe a specific medication. |  |
| 3.9 | Describe how cases of human abuse have led to strict regulations of human participation in clinical trials. |  |
| 3.10 | Describe an application of nanotechnology in medicine. |  |

## Benchmark 4: Understand signs and symptoms of organ failure

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 4.1 | Outline the evolution of the methods used to diagnose and treat diabetes from the 1800s to today. |  |
| 4.2 | Predict results of a bacterial transformation. |  |
| 4.3 | Outline the steps required to produce a protein in the laboratory. |  |
| 4.4 | Summarize the options available to patients with ESRD (End Stage Renal Disease). |  |
| 4.5 | Explain how dialysis machines work to remove wastes from the blood and adjust fluid and electrolyte imbalances. |  |
| 4.6 | Describe the procedures involved in a live donor laparoscopic nephrectomy. |  |
| 4.7 | Compare and contrast heart and kidney transplants. |  |
| 4.8 | Summarizes what factors need to be taken into account when deciding which patient should receive an organ donation. |  |
| 4.9 | Describe how xenotransplantation or tissue engineering work, as well as their potential risks, benefits, challenges, and ethical or moral concerns. |  |
| 4.10 | Evaluate current methods of disease prevention. |  |

I certify that the student has received training in the areas indicated.

Instructor Signature:

For more information, contact:

CTE Pathways Help Desk

(785) 296-4908

[pathwayshelpdesk@ksde.org](mailto:pathwayshelpdesk@ksde.org)



900 S.W. Jackson Street, Suite 102

Topeka, Kansas 66612-1212

[https://www.ksde.org](https://www.ksde.org/)

The Kansas State Department of Education does not discriminate on the basis of race, color, national origin, sex, disability or age in its programs and activities and provides equal access to any group officially affiliated with the Boy Scouts of America and other designated youth groups. The following person has been designated to handle inquiries regarding the nondiscrimination policies: KSDE General Counsel, Office of General Counsel, KSDE, Landon State Office Building, 900 S.W. Jackson, Suite 102, Topeka, KS 66612, (785) 296-3201.