### Course Competency: Nuclear Medicine Pre-Clinical

**Course Description:**
This nuclear medicine technology course prepares students to attend to patients, and evaluate data from patient records, make dose calculations, prepare radio-pharmaceuticals, perform in-vivo and in-vitro diagnostic studies, and perform quality control procedures. Prerequisites: BSC 2085/L, BSC 2086/L, CHM 1033/L; Corequisites: NMT 1002L, NMT 1312C, NMT 2613. (1 hr. lecture, 3 hr. clinical)

<table>
<thead>
<tr>
<th>Course Competency</th>
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| **Competency 1:** Students will be able to observe and Radiation safety procedures by: | - Communication  
- Critical thinking  
- Information Literacy |
| 1. Applying appropriate radiation safety theory for the use and storage of radionuclides  
2. Observing the use of nuclear medicine instruments to detect and measure radiation  
3. Witnessing the completion of quality control on gas detecting instruments |  |
| **Competency 2:** Students will be able to demonstrate and understanding of nuclear instrumentation by: | - Communication  
- Numbers / Data  
- Critical thinking  
- Information Literacy |
| 1. Identifying equipment and instruments used in nuclear medicine |  |
| **Competency 3:** Students will be able to calculate various radiopharmacy equations including generators, radiopharmaceutical kit preparation and patient dose preparation by: | - Communication  
- Numbers / Data  
- Critical thinking  
- Information Literacy  
- Computer / Technology Usage |

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1. Utilizing scientific notation in performing algebraic operations.
2. Performing radioactive dilution calculations.
3. Defining the units of radioactivity, radiation exposure, radiation absorbed dose, and radiation dose equivalent.
4. Performing calculations with logarithms and exponents using a calculator.
5. Discussing numeric accuracy, significant digits, and rounding.
6. Calculating quantities of radioactivity using the general form of the decay equation and decay factors.
7. Using tables of decay factors to calculate remaining radioactivity.
8. Calculating concentration and volume and radioactivity for patient doses.
9. Computing the concentration of 99Mo in 99mTc.
10. Computing effective half-life and biological half-life.
11. Calculating intensity with half-value layers.

**Competency 4:** Students will be able to discuss elements of patient and hospital safety by:

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<tbody>
<tr>
<td>1. Listing the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) national patient safety goals</td>
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<td>2. Discussing the JCAHO’s role in enabling specific improvements in patient safety</td>
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<td>3. Describing with the physiological effects of electrical current</td>
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<td>4. Describing strategies for the avoidance of electrical shock hazards</td>
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<td>5. Discussing the conditions needed for fire to exist</td>
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<td>6. Describing strategies for the avoidance of fires</td>
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<td>7. Describing the different types of fire extinguishers</td>
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<td>8. Describing the steps involved in using fire extinguishers</td>
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</table>
9. Discussing the general procedure for responding to a fire emergency

**Competency 5:** Students will be able to discuss elements of patient and hospital infection safety by:

1. Describing the process of cross-infection between patients and healthcare personnel
2. Describing infection control strategies that decrease host susceptibility, eliminate the source of pathogens and interrupt routes of transmission
3. Discussing the processing of contaminated Nuclear Medicine Care equipment (e.g., cleaning, disinfection, sterilization)

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**Competency 6:** Students will be able to conduct a patient interview and document patient history by:

1. Discussing the importance of patient interviews
2. Discussing the principles of conducting a patient interview
3. Discussing the techniques used in conducting a patient interview
4. Describing the format for the medical history
5. Discussing how the medical history is used for evaluating the patients problem and in determining the preparation and application to Nuclear Medicine Exams related to the following organs or systems: cardiovascular, central nervous system, endocrine, genitourinary hepatobiliary, respiratory, skeletal, and soft tissue

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