

1. ER460 Introduction to Health Physics
2. Credit Hours (3)/Contact Hours (3)
3. Course Director – Stephen R. McHale
4. Atoms, Radiation, and Radiation Protection, 3rd ed., by J. Turner; John Wiley, 2007 – ISBN 978-3-527-40606-7

5. Specific course information

- a. Broad and quantitative overview of health physics, including radiation sources, measurement and dosimetry, exposure, interaction in the body, biological effects, imaging and medical applications, protection, accidents, and regulations.
- b. Prerequisites: ER301
- c. Elective course

6. Educational objectives for the course

- a. apply physical concepts and principles to solve relevant problems related to nuclear physics and radiation dosimetry
- b. comprehend radiation safety standards and regulations published by international and U.S. regulatory agencies
- c. incorporate modern computing tools to estimate external and internal radiation doses due to an exposure to radioactive material.
- d. communicate effectively, both verbally and in writing, the critical examination and analysis of engineering problem
- e. demonstrate knowledge of contemporary nuclear issues

7. Specific program outcomes addressed by this course

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|------------|-----|-----|-----|-----|-----|-----|-----|
| Reinforced | | | X | X | X | | X |
| Mastered | X | | | | | | |

8. Brief list of topics to be covered

- a. Nuclear models, radioactivity, and decay
- b. Radiation interactions (electrons, photons, neutrons, heavy charged particles)
- c. Methods of external and internal dosimetry
- d. Cellular radiation biology
- e. Stochastic and deterministic effects of radiation
- f. Radiation shielding and standards of safety
- g. Background radiation exposure, risk, and mitigation
- h. Medical uses of radiation