

Radiation Biology and Techniques for RI in Biochemistry

Syllabus Number

5G355

Special Subjects

Elective 2 credit

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1. Course Description

In this course you will learn the following themes.

(1) radiation and radioactivity, (2) equipment using radiation, (3) influence of radiation on the human body, (4) basic of safe handling, (5) usage of RI in biochemistry, (6) prevention of radiation damage.

2. Course Objectives

Learning from this course will make it possible to objectively judge the usefulness and danger of radiation.

3. Grading Policy

The final assessment also includes the results of the final exam and the results of the report. The distribution ratio will be 65 points from test results and 35 points from report points.

4. Textbook and Reference

Textbook

Japan Radioisotope Association (ed.) ABC of Radiation (Revised Edition) (ISBN978-4-89073-212-8) Maruzen

5. Requirements(Assignments)

(1) This course requires basic knowledge of physics, chemistry, and mathematics, due this is lecture on radiation.

(2) Basic knowledge of biochemistry is also necessary for lectures on RI usage in biochemistry.

(3) Please use the designated textbook for preparation and review. Although some pages are not touched during classes, the entire scope of the textbook will be tested.

6. Note

(1) We also distribute printed materials every time. The lecture is based on textbooks and those materials.

(2) Education and training videos compiled by the Japan Radioisotope Association are also used.

7. Schedule

- [1] Introduction (What is Radiation)
- [2] Basic knowledge (Part 1: Radioactive isotope (RI) and radiation)
- [3] Basic knowledge (Part 2: Physicochemical influence of radiation)
- [4] Basic knowledge (Part 3: Exercise (decay and half life, etc.))
- [5] Basic knowledge (Part 4: Demonstration experiment)
- [6] Influence of radiation on the human body (Part 1: From physicochemical influence to biological effect)
- [7] Influence of radiation on human body (Part 2: Evaluation of exposure)
- [8] Safe handling of radioisotopes (Part 1: General safety education)
- [9] Safe handling of radioisotopes (Part 2: Safe handling of RI)
- [10] Safe handling of radioactive isotope (Part 3: More specific safety measures in biochemical field)
- [11] Examples of using RI in biochemistry (Part 1: Characterization of radioisotope-labeled compound, detection method, etc.)
- [12] Examples of using RI in biochemistry (Part 2: Amino acids, protein synthesis, etc.)
- [13] Examples of using RI in biochemistry (Part 3: Nucleic acid synthesis etc.)
- [14] Prevention of radiation injury, actualization and management of RI laboratory
- [15] Summary and Exam