**Course Specifications**

Valid as from the academic year 2014-2015

### Course size

<table>
<thead>
<tr>
<th>Credits</th>
<th>Study time</th>
<th>Contact hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0</td>
<td>90 h</td>
<td>15.0 h</td>
</tr>
</tbody>
</table>

### Course offerings and teaching methods in academic year 2016-2017

- **A (semester 2)** lecture

### Lecturers in academic year 2016-2017

- Van Eijkeren, Marc
  - GE17 lecturer-in-charge
- De Neve, Wilfried
  - GE17 co-lecturer
- Vakaet, Luc
  - GE17 co-lecturer

### Offered in the following programmes in 2016-2017

- **Master of Science in Biomedical Engineering** 3 A
- **International Master of Science in Biomedical Engineering** 3 A
- **Master of Science in Biomedical Engineering** 3 A

### Teaching languages

- English

### Keywords

- radiobiology, radiopathology

### Position of the course

The student is learned to evaluate the effects of interactions of ionising radiation on living cells, tissues and organs. The course builds on the knowledge of radiation effects on cells. This knowledge is extended to tissues and organs and serves as a basis for description of deterministic and stochastic effects. For deterministic effects, a description of the acute effects will be given for partial or total body irradiation (radiation accidents, radiation therapy). Several modulators on these effects are discussed. As for the stochastic effects, both the somatic effects (induction of cancer) and genetic effects will be discussed. A separate chapter will discuss the effects of ionizing radiation in specific situations using examples.

### Contents

- Radiation effects on the cellular level: Simple description cellular structures with direct implementation for radiobiology., DNA damage, Modulators of radiation damage
- Radiation effects on tissues and organs: Deterministic effects, Stochastic effects
- Radiation exposure in specific situations with respect to biological effects: Radiation burden to the Belgian public, Cosmic radiation, Naturally Occurring Radioactive Materials - NORM, Human activities, Radiation effects to aircrew, Radiation effects in utero

### Initial competences

- Biology, basic knowledge of ionising radiation - radiation physics

### Final competences

After introducing basic knowledge, at the end of the course, the student will have profound knowledge of the biological effects of ionising radiation in different situations.

### Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

(Approved)
Conditions for exam contract
This course unit cannot be taken via an exam contract

Teaching methods
Lecture

Extra information on the teaching methods
Classroom lectures

Learning materials and price
Optional;
Steel G. Basic Clinical Radiobiology 2002, Arnold Publishers - 43 USD Hall E.
Radiobiology for the radiologist 2005, Lippincott Williams and Wilkins - 100 USD

References

Course content-related study coaching

Evaluation methods
end-of-term evaluation

Examination methods in case of periodic evaluation during the first examination period
Written examination

Examination methods in case of periodic evaluation during the second examination period
Written examination

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation
not applicable

Extra information on the examination methods
During examination period: written closed-book exam; written closed-book exam

Calculation of the examination mark
Evaluation during examination period

(Approved)