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Undergraduate Programme in Physics

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MODULE HANDBOOK

Module Name	Physics of Radiotherapy
Module level, if applicable	Bachelor
Code, if applicable	FIS425066
Subtitle, if applicable	-
Courses, if applicable	-
Semester(s) in which the module is taught	7th (Seventh)
Person responsible for the module	Dr. Nita Handayani, M.Si
Lecturer(s)	Dr. Nita Handayani, M.Si
Language	Indonesia
Relation to curriculum	compulsory course in the fourth year (7th semester) Bachelor Degree
Type of teaching, contact hours	150 minutes lectures, and 180 minutes structured activities per week.
Workload	Total workload is 136 hours per semester, which consists of 150 minutes lectures per week for 14 weeks, 180 minutes structured activities per week, 180 minutes individual study per week, in total is 16 weeks per semester, including mid exam and final exam
Credit points	3
Requirements according to the examination regulations	Minimum attendance 75% All assignments submitted Attendance on time
Recommended prerequisites	No prerequisites stated on
Module objectives/intended learning outcomes	After completing this course, the students: CO 1. Able to explain the basic aspects of radiation physics and radiobiology aspects in the field of radiotherapy. CO 2. Able to explain various radiotherapy techniques such as Brachytherapy, External beam radiotherapy (EBRT), Conformal and Intensity-Modulated Radiotherapy. CO 3. Able to explain the Treatment Planning System and several types of modalities used in radiotherapy. CO 4. Able to apply the principles of dosimetry and radiation protection in radiotherapy.
Content	1. Basic Principles of Physics in Radiotherapy 2. Basic Aspects of Radiation Physics for Radiotherapy 3. Biological Aspects of Radiation Effects (Radiobiology) in Radiotherapy 4. Radiotherapy Techniques: Brachytherapy, External beam radiotherapy (EBRT), Conformal and Intensity-Modulated Radiotherapy 5. Introduction to TPS (Treatment Planning System) 6. Co-60 Machine

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<table>
<tr><td></td><td>7. Linac (Linear Accelerator)
8. Therapy with open sources (unsealed sources)
9. Principles of Calculating Patient Doses
10. Radiation Protection in Radiotherapy</td></tr>
<tr><td>Study and examination requirements and forms of examination</td><td>The final mark will be weighted as follows:
<table>
<tr><th>NO</th><th>Assessment methods (components, activities)</th><th>Weight (percentage)</th></tr>
<tr><td>1</td><td>Final Examination</td><td>30%</td></tr>
<tr><td>2</td><td>Mid-Term Examination</td><td>30%</td></tr>
<tr><td>3</td><td>Class Activities : Quiz, Homework, etc.</td><td>20%</td></tr>
<tr><td>4</td><td>Project Based Learning (PBL)</td><td>20%</td></tr>
</table>
The final assessment is expressed in the form of a letter value converted from a number value with the following categories:
<table>
<tr><th>NO</th><th>Number Value</th><th>Letter Value</th><th>NO</th><th>Number Value</th><th>Letter Value</th></tr>
<tr><td>1</td><td>≥ 95</td><td>A</td><td>7</td><td>65-69.99</td><td>B/C</td></tr>
<tr><td>2</td><td>90-94.99</td><td>A-</td><td>8</td><td>60-64.99</td><td>C+</td></tr>
<tr><td>3</td><td>85-89.99</td><td>A/B</td><td>9</td><td>55-59.99</td><td>C</td></tr>
<tr><td>4</td><td>80-84.99</td><td>B+</td><td>10</td><td>50-54.99</td><td>C-</td></tr>
<tr><td>5</td><td>75-79.99</td><td>B</td><td>11</td><td>55-34.99</td><td>D</td></tr>
<tr><td>6</td><td>70-74.99</td><td>B-</td><td>12</td><td><35</td><td>E</td></tr>
</table></td></tr>
<tr><td>Media employed</td><td>White-board, LCD Projector, e-learning (https://daring.uin-suka.ac.id/)</td></tr>
<tr><td>Reading list</td><td>1. Mayles P., Nahum A., Rosenwald J.C., Handbook of Radiotherapy Physics: Theory and Practice, Taylor and Francis, 2007
2. Khan, F.M., Physics of Radiation Therapy, Lippincott Williams & Wilkins, 2003
3. Podgorsak, E. B., Radiation Oncology Physics: A Handbook for Teachers and Students, International Atomic Energy Agency, 2005
4. Yves Lemoigne and Alessandra Caner, Radiotherapy and Brachytherapy, Springer, France, 2007</td></tr>
</table>

PLO and CO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9
CO 1		√							
CO 2				√					
CO 3					√				
CO 4							√		