UNIVERZITET U SARAJEVU
PRIRODNO-MATEMATIČKI FAKULTET

UNIVERSITY OF SARAJEVO – FACULTY OF SCIENCE
Department of Chemestry

Course ID: HOO123	**Course name: PHYSICS II**		
Cycle: FIRST	**Year: FIRST**	**Semester: II**	**ECTS credits:** 4
Status: MANDATORY		**Total course hours: 60** **Lectures : 30** **Laboratory work and exercises: 30**	

Teaching participants	**Teachers and associates with expertise in the field to which the subject**
Prerequisite for enrollment:	-
Course aims:	The main aim of this course is to introduce basic physical phenomena and topics from electrodynamics, atomic and quantum physics so that presented knowledged and acquired skills can be futher applied in related fields in chemestry.
Thematic course units:	1. Properties of the electromagnetic waves. Flux and intensity. 2. Superposition principle. Interference and diffracion examples. Diffraction of the x-rays. . 3. Interaction of the electromagnetic radiation with matter. Beer-Lambertov law. Polarisation and liquid crystals. 4. Thermal radiation. Stefan-Boltzmann i Wien law. Planck's hypothesis. Photoelectric effect. 5. Atomic spectra. First atomic models. Moseley law and discrete x-ray radiation. Franck-Hertz experiment. 6. Matter waves. Electron diffraction and Young's experiment with electrons. Heisenberg's uncertinity relation. 7. Postulates of quantum mehanics. Postulati kvantne mehanike. Schrödinger equation and quantum-mechanical model of hydrogen. Quantum numbers and electron's spin. Stern- Gerlach experiment. 8. Atom in electric and magnetic field. Stark and Zeman effects. 9. Test 1 10. Pauli exlusion principle. Electronic configuration and periodic system of elements. 11. Electroni configuration of diatomic molecules. Rotational and vibrational spectra. Raman spectroscopy. 12. Molecular orbitals of diatomic molecules. 13. Natural radioaktictivity. Radioactive series. 14. Nuclei models: liquid drop and shell model. Zeema effect for nucleons. 15. Application of the nuclear magnetic resonance.
Learning outcomes:	Knowledge: Basic theoretical and practical knowledge of physical models for solving and analyzing different phenomena in atomic, quantum and nuclear physics. Skills: Independetly to analyze and solve problems using model approach.

<table>
<tr><td></td><td>Competences: application of physical model in solving problems, using basic scientific instruments such as osciloscope, multimeter, photodetectors, AC/DC power supply, etc, and plotting data.</td></tr>
<tr><td>Metode izvođenja nastave:</td><td>Auditory lectures and laboratory work and exercices.</td></tr>
<tr><td>Assessement methods and grading system[1]:</td><td>
<table>
<tr><th colspan="3">Grading criteria</th></tr>
<tr><td>Criteria</td><td>Maximal score</td><td>Required score</td></tr>
<tr><td>Laboratory work</td><td>20</td><td>11</td></tr>
<tr><td>Midterm exam</td><td>40</td><td>22</td></tr>
<tr><td>Final exam</td><td>40</td><td>22</td></tr>
<tr><td>Total</td><td>100</td><td>55</td></tr>
</table>
<table>
<tr><th colspan="3">Scores and grading</th></tr>
<tr><td>Score</td><td>Grade (BiH)</td><td>Grade (ECTS)</td></tr>
<tr><td><55</td><td>5</td><td>F, FX</td></tr>
<tr><td>55-64</td><td>6</td><td>E</td></tr>
<tr><td>65-74</td><td>7</td><td>D</td></tr>
<tr><td>75-84</td><td>8</td><td>C</td></tr>
<tr><td>85-94</td><td>9</td><td>B</td></tr>
<tr><td>95-100</td><td>10</td><td>A</td></tr>
</table>
</td></tr>
<tr><td>Literature[2]:</td><td>Mandatory literature:
1. Lecture notes.
2. L. Tanović, N. Tanović; Fizika: osnove atomske i nuklearne fizike, Svjetlost – Zavod za udžbenike i nastavna sredstava, Sarajevo, 1991.
3. S. Marić, Fizika, I.P. „Svjetlost“ d.d., Sarajevo, 2002.
4. Z. Hadžibegović, Fizika II: praktikum laboratorijskih i računskih vježbi, Univerzitet u Sarajevu, Sarajevo, 2014.
Supplementary literature:
1. S. Bikić, Zbirka riješenih zadataka iz fizike, Dom štampe, Zenica, 1998.</td></tr>
</table>

[1] The grading structure for each subject is determined by the Council of the organizational unit before the beginning of the academic year in which the subject is taught as per Article 64, paragraph 6 of the Law on Higher Education of Sarajevo Canton.

[2] The Senate of the higher education institution, as an institution, or the Council of the organizational unit of the higher education institution, as a public institution, determines by a special decision, which is published on its website before the beginning of the academic year obligatory, mandatory and recommended textbooks and manuals, as well as other recommended literature based on which exams are prepared and taken as per Article 56, paragraph 3 of the Law on Higher Education of the Sarajevo Canton