



<b>COURSE: PHYSICS III</b>		
<b>DEGREE: BIOMEDICAL ENGINEERING</b>	<b>YEAR: 2nd</b>	<b>TERM: 1st</b>

WEEKLY PLANNING									
WEEK	SESSION	DESCRIPTION	GROUPS (mark X)		SPECIAL ROOM FOR SESSION (Computer class room, audio-visual class room)	Indicate YES/NO	WEEKLY PROGRAMMING FOR STUDENT		
			LECTURES	SEMINARS			DESCRIPTION	CLASS HOURS	HOMEWORK HOURS (Max. 7h week)
1	1	<b>1. Presentation of the Course, Electric Charges and Electric Forces</b> - Electric Charge. - Coulomb's Law - Dimensions and Units. - The Superposition Principle.	X				- Reading of the corresponding chapters in the proposed literature. - Study and personal work on the lecture (i.e. searching additional information, etc)	1,7	5
1	2			X			- Solve the proposed exercises. - Participation in discussions and activities.	1,7	
2	3	<b>2. The Electric Field of general Charge Distributions</b> - Definition of Electric Fields. - Electric Field Created by a Point Charge. - The Superposition Principle. -The Electric Field Lines. - Electric Fields of general Charge Distributions.	X				- Reading of the corresponding chapters in the proposed literature. - Study and personal work on the lecture (i.e. searching additional information, etc)	1,7	5

2	4			X			- Solve the proposed exercises. - Participation in discussions and activities.	1,7	
3	5	<b>3. The Electric Flux and Gauss' Law</b>  - Flux of a vector Field. - The Electric Flux. - Gauss' Law. - Use of Gauss' Law to calculate the Electric Field.	X				- Reading of the corresponding chapters in the proposed literature. - Study and personal work on the lecture (i.e. searching additional information, etc)	1,7	5
3	6			X			- Solve the proposed exercises. - Participation in discussions and activities.	1,7	
4	7	<b>4. Electrostatic Potential Energy</b>  - Gravitational Potential Energy. - Electrostatic Potential Energy. - Energy Conservation. - Electrostatic Potential. - Electric Potential Difference. - Equipotential surfaces and lines.	X				- Reading of the corresponding chapters in the proposed literature. - Study and personal work on the lecture (i.e. searching additional information, etc)	1,7	5
4	8			X			- Solve the proposed exercises. - Participation in discussions and activities.	1,7	
5	9	<b>5. Electrostatic Potential (cont.)</b>  - Electrostatic Potential of General Charge Distributions. - Potential of a System of Charges. - Relation between Electrostatic Potential en Electric Field. - Electrostatic Energy of a System of Charges. - Electric Conductors in Equilibrium. - Conductors in Electrostatic Equilibrium - Matter Aggregations.	X				- Reading of the corresponding chapters in the proposed literature. - Study and personal work on the lecture (i.e. searching additional information, etc)	1,7	5
5	10	- <b>Test exam #1(*)</b>		X			- Solve the proposed exercises. - <b>TEST EXAM</b>	1,7	
6	11	<b>6. Capacitance and dielectrics</b>  - Capacitance. - Parallel Plane, Cylindrical and spherical Capacitors. - Capacitors in circuits. - Dielectrics. Electric Properties of Matter.	X				- Reading of the corresponding chapters in the proposed literature. - Study and personal work on the lecture (i.e. searching additional information, etc)	1,7	5

		<ul style="list-style-type: none"> <li>- Energy stored in Capacitors.</li> <li>- Energy Density of the Electrical Field.</li> </ul>							
6	12			X			<ul style="list-style-type: none"> <li>- Solve the proposed exercises.</li> <li>- Participation in discussions and activities.</li> </ul>	1,7	
7	13	<b>7. Current and Resistance</b> <ul style="list-style-type: none"> <li>- Current density and current intensity</li> <li>- Ohm's law</li> <li>- Resistance and conductivity</li> <li>- Joule's Law</li> <li>- Energy and Power in Electric Circuits</li> <li>- Electromotive Force</li> </ul>	X				<ul style="list-style-type: none"> <li>- Reading of the corresponding chapters in the proposed literature.</li> <li>- Study and personal work on the lecture (i.e. searching additional information, etc)</li> </ul>	1,7	5
7	14			X			<ul style="list-style-type: none"> <li>- Solve the proposed exercises.</li> <li>- Participation in discussions and activities.</li> </ul>	1,7	
8	15	<b>8. Magnetic Fields</b> <ul style="list-style-type: none"> <li>- Magnetic Field.</li> <li>- Lorentz's Force on a Charged Particle.</li> <li>- Magnetic Force on a Current-Carrying Wire.</li> <li>- Torque on a Current-Carrying Loop.</li> <li>- Magnetic Moment.</li> </ul>	X				<ul style="list-style-type: none"> <li>- Reading of the corresponding chapters in the proposed literature.</li> <li>- Study and personal work on the lecture (i.e. searching additional information, etc)</li> </ul>	1,7	5
8	16	- <b>Test exam #2(*)</b>		X			<ul style="list-style-type: none"> <li>- Solve the proposed exercises.</li> <li>- <b>TEST EXAM.</b></li> </ul>	1,7	
9	17	<b>9. Sources of Magnetic Fields</b> <ul style="list-style-type: none"> <li>- Sources of the Magnetic Field.</li> <li>- Biot-Savart's Law.</li> <li>- Forces Between Current-Carrying Conductors.</li> <li>- Magnetic Flux.</li> <li>- Ampère's Law.</li> <li>- Application of Ampère's Law to Calculate Magnetic Fields.</li> <li>- Magnetic Properties of Matter.</li> </ul>	X				<ul style="list-style-type: none"> <li>- Reading of the corresponding chapters in the proposed literature.</li> <li>- Study and personal work on the lecture (i.e. searching additional information, etc)</li> </ul>	1,7	5
9	18			X			<ul style="list-style-type: none"> <li>- Solve the proposed exercises.</li> <li>- Participation in discussions and activities.</li> </ul>	1,7	
10	19	<b>10. Electromagnetic Induction</b>	X				<ul style="list-style-type: none"> <li>- Reading of the corresponding chapters in the proposed literature.</li> </ul>	1,7	5

		<ul style="list-style-type: none"> <li>- Faraday's Law of Induction.</li> <li>- Motional Electromotive Force.</li> <li>- Lenz's Law</li> <li>- Electromagnetic Induction.</li> <li>- Self-Inductance ad Mutual Induction</li> <li>- Energy and Energy Density of a Magnetic Field</li> </ul>					<ul style="list-style-type: none"> <li>- Study and personal work on the lecture (i.e. searching additional information, etc)</li> </ul>		
10	20			X			<ul style="list-style-type: none"> <li>- Solve the proposed exercises.</li> <li>- Participation in discussions and activities.</li> </ul>	1,7	
11	21	<b>11. Electromagnetic Waves</b> <ul style="list-style-type: none"> <li>- Displacement Current.</li> <li>- Maxwell's Equations.</li> <li>- Wave Solutions to Maxwell's Equations.</li> <li>- The Speed of Light.</li> <li>- The Electromagnetic spectrum.</li> <li>- Traveling waves.</li> <li>- Poynting Vector.</li> </ul>	X				<ul style="list-style-type: none"> <li>- Reading of the corresponding chapters in the proposed literature.</li> <li>- Study and personal work on the lecture (i.e. searching additional information, etc)</li> </ul>	1,7	5
11	22			X			<ul style="list-style-type: none"> <li>- Solve the proposed exercises.</li> <li>- Participation in discussions and activities.</li> </ul>	1,7	
12	23	<b>12. Properties of Light</b> <ul style="list-style-type: none"> <li>- Propagation of Light.</li> <li>- Reflexion, Refraction and Absorption.</li> <li>- Interference. Double Slit Experiment.</li> <li>- Diffraction. Double Slit Interference.</li> <li>- Circular Aperture. Diffraction Limits.</li> </ul>	X				<ul style="list-style-type: none"> <li>- Reading of the corresponding chapters in the proposed literature.</li> <li>- Study and personal work on the lecture (i.e. searching additional information, etc)</li> </ul>	1,7	5
12	24	- <b>Test exam #3(*)</b>		X			<ul style="list-style-type: none"> <li>- Solve the proposed exercises.</li> <li>- <b>TEST EXAM.</b></li> </ul>	1,7	
13	25	<b>Tutorial</b>	X				- <b>TUTORIAL.</b>	1,7	5

n.a.	26	<b>Lab session 1(**)</b> Electrostatic and Electric current			4.SB01- 4.SB02- 4.SB03		<ul style="list-style-type: none"> <li>- Reading of the guideline document.</li> <li>- Data acquisition</li> <li>- Analysis of results</li> <li>- Preparation of the report</li> </ul>	1,7	3
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n.a.	27	<b>Lab session 2(**)</b> Magnetism			4.SB01- 4.SB02- 4.SB03		- Reading of the guideline document. - Data acquisition - Analysis of results - Preparation of the report	1,7	3
n.a.	28	<b>Lab session 3(**)</b> Electromagnetic Induction			4.SB01- 4.SB02- 4.SB03		- Reading of the guideline document. - Data acquisition - Analysis of results - Preparation of the report	1,7	3
n.a.	29	<b>Lab session 4(**)</b> Electromagnetic Waves and Optics			4.SB01- 4.SB02- 4.SB03		- Reading of the guideline document. - Data acquisition - Analysis of results - Preparation of the report	1,7	3

(\*) Dates of the test exams are tentative

(\*\*) Dates of laboratory sessions are not yet available.

<b>Subtotal 1</b>								<b>49,3</b>	<b>77</b>
<b>Total 1 (Hours of class plus student homework hours between weeks 1-14)</b>								126,3	

15		- <b>Recovery Test exam #4</b> (week 14/15) (*) Tutorials, handing in, etc						2	2,7
16- 18		Assessment						3	17
<b>Subtotal 2</b>								<b>5</b>	<b>19,7</b>
<b>Total 2 (Hours of class plus student homework hours between weeks 15-18)</b>								24,7	

<b>TOTAL (Total 1 + Total 2. Maximum 180 hours)</b>								<b>151</b>	
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