Universidad Carlos III de Madrid
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| COURSE: Biomaterials Experimental Design | | |
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| **DEGREE: Biomedical Engineering** | **YEAR: 2017/2018** | **TERM: 2** |

## WEEKLY PLANNING

| WEEK | SESSION | DESCRIPTION | GROUPS (mark X) | | SPECIAL ROOM FOR SESSION (Computer class room, audio-visual class room) | Indicate YES/NO If the session needs 2 teachers | WEEKLY PROGRAMMING FOR STUDENT | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | LECTURES | SEMINARS | | | DESCRIPTION | CLASS HOURS | HOMEWORK HOURS (Max. 7h week) |
| 1 **Th 25 Jan** | 1 | Introduction (Overview + objectives) | x | | | | | 1.6 | 6 |
| 1 **Mo 29 Jan** | 2 | Finding inspiration in nature: spider silk-based biomaterials | x | | | | Reading of proposed topics. Bibliographic research | 1.6 | |
| 2 **Th 01 Feb** | 3 | Tissue-organ-on a chip | x | | | | Reading of proposed topics. Bibliographic research | 1.6 | 6 |
| 2 **Mo 05 Feb** | 4 | 3D Bioprinting | x | x | | | Reading of proposed topics. Bibliographic research | 1.6 | |
| 3 **Th 08 Feb** | 5 | Mechanotransduction | x | x | | | Reading of proposed topics. Bibliographic research | 1.6 | 6 |
| 3 **Mo 12 Feb** | 6 | Atomic force microscopy of living cells | x | | | | Reading of proposed topics. Bibliographic research | 1.6 | |

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| 4<br>**Th 15 Feb** | 7 | Experimental research I | | x | | | UC3M Bioengineering Labs | 1.6 | 6 |
| 4<br>**Mo 19 Feb** | 8 | Analysis of stem cell niches: micro- and nano-scale surface engineering I | x | | | | Reading of proposed topics. Bibliographic research | 1.6 | |
| 5<br>**Th 22 Feb** | 9 | Experimental research II | | x | | | UC3M Bioengineering Labs | 1.6 | 6 |
| 5<br>**Mo 26 Feb** | 10 | Analysis of stem cell niches: micro- and nano-scale surface engineering II | | x | | | Presentation and discussion of some practical examples, problems and articles | 1.6 | |
| 6<br>**Th 01 Mar** | 11 | Experimental research III | | | | | UC3M Bioengineering Labs | 1.6 | 6 |
| 6<br>**Mo 05 Mar** | 12 | Nanotechnologies for drug, protein and gene delivery I | x | | | | Reading of proposed topics. Bibliographic research | 1.6 | |
| 7<br>**Th 08 Mar** | 13 | Nanotechnologies for drug, protein and gene delivery II | | x | | | Presentation and discussion of some practical examples, problems and articles | 1.6 | 6 |
| 7<br>**Mo 12 Mar** | 14 | Experimental research IV | | x | | | UC3M Bioengineering Labs | 1.6 | |
| 8<br>**Th 15 Mar** | 15 | CONTINUOUS EVALUATION: TEST | | | | | | 1.6 | 6 |
| 8<br>**Mo 19 Mar** | 16 | Microfabrication I | x | | | | Reading of proposed topics. Bibliographic research | 1.6 | |
| 9<br>**Th 22 Mar** | 17 | Microfabrication II | x | | | | Reading of proposed topics. Bibliographic research | 1.6 | 6 |
| 9<br>**Th 05 Apr** | 18 | Biosensors I | x | | | | Reading of proposed topics. Bibliographic research | 1.6 | |
| 10<br>**Mo 09 Apr** | 19 | Biosensors II | x | | | | Reading of proposed topics. Bibliographic research | 1.6 | 6 |
| 10<br>**Th 12 Apr** | 20 | Experimental research V | | x | | | UC3M Bioengineering Labs | 1.6 | |
| 11<br>**Mo 16 Apr** | 21 | Nanotechnologies for drug, protein and gene delivery III | x | | | | Reading of proposed topics. Bibliographic research | 1.6 | 6 |
| 11<br>**Th 19 Apr** | 22 | Experimental research VI | | x | | | UC3M Bioengineering Labs | 1.6 | |
| 12<br>**Mo 23 Apr** | 23 | Nanotechnologies for drug, protein and gene delivery IV | | x | | | Presentation and discussion of some practical examples, problems and articles | 1.6 | 6 |
| 12<br>**Th 26 Apr** | 24 | Laser applications in the biomedical field | x | | | | Presentation and discussion of some practical examples, problems and articles | 1.6 | |
| 13<br>**Th 03 May** | 25 | Experimental research VII | | x | | | UC3M Bioengineering Labs | 1.6 | 6 |

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| 13<br>**Mo 07 May** | 26 | Presentation by students I | | x | | | | 1.6 | |
| 14<br>**Th 10 May** | 27 | Presentation by students II | | x | | | | 1.6 | 3 |
| | | | | | | | **Subtotal 1** | **43.2** | **81** |
| | | | | | | | **Total 1** *(Hours of class plus student homework hours between weeks 1-14)* | 124.2 | |

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|---|---|---|---|---|---|---|---|---|---|
| 15 | | Tutorials, handing in, etc | | | | | | 1.5 | |
| 16 | | Assessment | | | | | | 3 | 6 |
| 17 | | | | | | | | | |
| 18 | | | | | | | | | |
| | | | | | | | **Subtotal 2** | **4.5** | **6** |
| | | | | | | | **Total 2** *(Hours of class plus student homework hours between weeks 15-18)* | 10.5 | |

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| **TOTAL A** *(Total 1 + Total 2)* | **134.7** |

**LABORATORIES CLASSES PROGRAMMING (*)**

| WEEK | SESSION | DESCRIPTION | LABORATORY | WEEKLY PROGRAMMING FOR STUDENT | | |
|---|---|---|---|---|---|---|
| | | | | DESCRIPTION | CLASS HOURS | HOMEWORK HOURS (Max. 7h week) |
| | 1 | Cationic polymers for gene transfection I | UC3M Bioengineering Labs | Teams of 10 students | 1.6 | 1 |
| | 2 | Cationic polymers for gene transfection II | UC3M Bioengineering Labs | Teams of 10 students | 1.6 | 1 |
| | 3 | Microfabrication of microfluidic chips I | UC3M Bioengineering Labs | Teams of 10 students | 1.6 | 1 |
| | 4 | Microfabrication of microfluidic chips II | UC3M Bioengineering Labs | Teams of 10 students | 1.6 | 1 |
| | 5 | 3D Bioprinting I | UC3M Bioengineering Labs | Teams of 10 students | 1.6 | 1 |
| | 6 | 3D Bioprinting II | UC3M Bioengineering Labs | Teams of 10 students | 1.6 | 1 |
| | 7 | 3D Bioprinting III | UC3M Bioengineering Labs | Teams of 10 students | 1.6 | 1 |
| | 8 | Smart-hydrogels for drug delivery I | UC3M Bioengineering Labs | Teams of 10 students | 1.6 | 1 |
| | 9 | Smart-hydrogels for drug delivery II | UC3M Bioengineering Labs | Teams of 10 students | 1.6 | 1 |

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| | 10 | Smart-hydrogels for drug delivery III | UC3M Bioengineering Labs | Teams of 10 students | 1.6 | 1 |
| | | | | **Subtotal 3** | **16** | **10** |

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| **Total 3** *(Hours of class plus student homework hours of ten sessions laboratories)* | **26** |

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| **TOTAL B** *(Total 3)* | **26** |

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| **TOTAL** *(Total A + Total B. Maximum 180 hours)* | **160.7** |

***(*)*** *In EPS are given an additional 16 hours of laboratory practices along ten sessions.*