# Special Courses of Master Degree in Pharmaceutical Sciences

## Microbiology and Immunology Department

**1-General Courses :(0600700) (12 cr. h)**
**2- Specialized Courses: (12 cr. h)**

### First Semester (5 cr. h)

| No. | Course code | Courses | Credit hours | |
|---|---|---|---|---|
| | | | L | P |
| 1 | 0604701 | Advanced General Microbiology | 3 | -- |
| 2 | 0604702 | Pharmaceutical Microbiology | 2 | -- |
| **Total** | | | **5** | |

### Second Semester (7 cr. h)

| No. | Course cod | Courses | Credit hours | |
|---|---|---|---|---|
| | | | L | P |
| 3 | 0604703 | Antimicrobial Chemotherapeutic Agents | 2 | -- |
| 4 | 0604704 | Advanced Molecular Microbiology | 3 | -- |
| 5 | | Elective course | 2 | -- |
| **Total** | | | **7** | |

### Elective Courses

| No. | Course code | Courses | Credit hours | |
|---|---|---|---|---|
| | | | L | P |
| 1 | 0604705 | Protein Expression and Purification | 2 | -- |
| 2 | 0604706 | Analysis of Bacterial Genome | 2 | -- |

# Course Description of Master Degree in Pharmaceutical Sciences

## Microbiology and Immunology Department

### First Semester (5 cr. h)

| Course Name | Credit hours | | Code No. |
|---|---|---|---|
| | L | P | |
| **Advanced General Microbiology** | 3 | -- | 0604701 |

**Description:** Study the principles of microbial diversity, physiology and metabolism, microbial genetics and pathogenesis with emphasis on advanced methods for study of pathogenic bacteria.
University of Barcelona. Link:

- https://www.ub.edu/web/ub/en/estudis/oferta_formativa/master_universitari/fitxa/A/M0Q05/index.html

| Course Name | Credit hours | | Code No. |
|---|---|---|---|
| | L | P | |
| **Pharmaceutical Microbiology** | 2 | -- | 0604702 |

**Description:** To understand and apply the fundamentals of pharmaceutical microbiology including principles of sanitation, disinfection, sterilization and aseptic pharmacy.
The University of Sydney, Australia. Link:

- https://sydney.edu.au/courses/units-of-study/2018/phar/phar5712.html

### Second Semester (7 cr. h)

| Course Name | Credit hours | | Code No. |
|---|---|---|---|
| | L | P | |
| **Antimicrobial Chemotherapeutic Agents** | 2 | -- | 0604703 |

**Description:** Learn about mechanisms of action of different classes of antimicrobial chemotherapeutic agents. The course will highlight the important events that link basic research to clinical and pharmaceutical application of new drugs.
Michigan State University. Link:

- https://phmtox.msu.edu/education/courses/phm483/

| Course Name | Credit hours | | Code No. |
|---|---|---|---|
| | L | P | |
| **Advanced Molecular Microbiology** | 3 | -- | 0604704 |

**Description:** Study of advanced molecular microbiology, the regulation of gene expression, principles of genetic engineering, gene cloning, DNA sequencing, recombinant DNA technology and hybridoma technology.
University of Nottingham, UK. Link:

- https://www.nottingham.ac.uk/pgstudy/courses/biology-biomedical-and-life-sciences/clinical-and-molecular-microbiology-msc.aspx

## Elective Courses

| Course Name | Credit hours | | Code No. |
|---|---|---|---|
| | L | P | |
| **Protein Expression and Purification** | 2 | -- | 0604705 |

**Description:** This course builds on the student's knowledge and understanding of key and advanced concepts in protein expression and purification technologies to increase his/her ability to design advanced experimental research including processes involved in gene expression and regulation, protein-tagging design and vector selection, protein stability studies and bioinformatic tools to characterize proteins, besides chromatographic techniques specifically used in protein biopharmaceuticals purification. Moreover, the course builds on the student's ability to analyze and interpret data obtained from advanced experimental research

- https://www.dtu.dk/english/education/msc/programmes/applied-chemistry#study-programme__study-lines__protein-chemistry

| Course Name | Credit hours | | Code No. |
|---|---|---|---|
| | L | P | |
| **Analysis of Bacterial Genome** | 2 | -- | 0604706 |

**Description:** This course builds on the student's basic knowledge of the structure of the genetic material (DNA and RNA) of bacteria and allows the student to investigate whole bacterial genomes. It will also enable the student to use whole genome sequencing (WGS) data for the identification of bacterial species, antimicrobial resistance genes as well as virulence genes. Additionally, the course aims to equip the student with the skills to use WGS data for bacterial typing. The course will acquaint the student with some of the tools available online for the analysis of bacterial genomes.

- https://www.coursera.org/learn/wgs-bacteria?ranMID=40328andranEAID=SAyYsTvLiGQandranSiteID=SAyYsTvLiGQ-XDUMTlcHCsRNhqd4gy2qNwandsiteID=SAyYsTvLiGQ-XDUMTlcHCsRNhqd4gy2qNwandutm_content=10andutm_medium=partnersandutm_source=linkshareandutm_campaign=SAyYsTvLiGQ