



# Course Specification

(Postgraduate)

**Course Title:** Biomedical sciences applications

**Course Code:** 373520-2

**Program:**

Master of Clinical Laboratory Sciences in Molecular Diagnostics

**Department:** Clinical Laboratory Sciences

**College:** Applied medical Sciences

**Institution:** Taif University

**Version:** No 3

**Last Revision Date:** 18/01/2024



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## A. General information about the course:

### 1. Course Identification:

|   |  |                                  |  |
|---|--|----------------------------------|--|
| <b>1. Credit hours: (2 hrs.)</b>  |  |                                  |  |
| <b>2. Course type</b>   |  |                                  |  |
| A.  | <input type="checkbox"/> University          | <input type="checkbox"/> College | <input checked="" type="checkbox"/> Department <input checked="" type="checkbox"/> Track |
| B.  | <input checked="" type="checkbox"/> Required |                                  | <input type="checkbox"/> Elective  |
| <b>3. Level/year at which this course is offered: (3<sup>rd</sup> level/2<sup>nd</sup> year)</b>  |  |                                  |  |
| <b>4. Course general Description:</b>   |  |                                  |  |
| Biomedical sciences combine the fields of biology and medicine in order to focus on the health and well-being of humans. These sciences are the cornerstone of modern health care and laboratory diagnostics technologies. This course introduces in-depth knowledge of the applications and uses of diverse biomedical technologies in different fields of our changeable world, with examples pulled from medicine, industry and other life-related fields as needed. Additionally, this course will also provide a capacity of understanding the clinical, social, and economic implications of these biomedical technologies. |  |                                  |  |
| <b>5. Pre-requirements for this course (if any):</b>  |  |                                  |  |
| None  |  |                                  |  |
| <b>6. Pre-requirements for this course (if any):</b>  |  |                                  |  |
| None  |  |                                  |  |
| <b>7. Course Main Objective(s):</b>   |  |                                  |  |
| This course aims to   |  |                                  |  |
| <ol style="list-style-type: none"> <li>1- Introduce the applicability of the biomedical sciences to the updated life aspects.</li> <li>2- Enhance understanding of the realities of scientific practice in today's environment of scarce resources, high competitiveness, and low regulation.</li> <li>3- Develop student's thinking about issues related to biomedical sciences, scientific integrity and the important conduct of research and development.</li> </ol>  |  |                                  |  |

### 2. Teaching Mode: (mark all that apply)

| No | Mode of Instruction  | Contact Hours                    | Percentage |
|----|--|----------------------------------|------------|
| 1  | Traditional classroom  | 2 hours /week= 30 hours/semester | 100        |
| 2  | E-learning   | N/A                              | 0          |
| 3  | Hybrid <ul style="list-style-type: none"> <li>• Traditional classroom</li> <li>• E-learning</li> </ul> | N/A                              | 0          |
| 4  | Distance learning  | N/A                              | 0          |





### 3. Contact Hours: (based on the academic semester)

| No | Activity              | Contact Hours |
|----|-----------------------|---------------|
| 1. | Lectures              | 30            |
| 2. | Laboratory/Studio     | N/A           |
| 3. | Field                 | N/A           |
| 4. | Tutorial              | N/A           |
| 5. | Others (specify)..... | N/A           |
|    | <b>Total</b>          | <b>30</b>     |

### B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:

| Code       | Course Learning Outcomes   | Code of PLOs aligned with program | Teaching Strategies                         | Assessment Methods                         |
|------------|--|-----------------------------------|---|--|
| <b>1.0</b> | <b>Knowledge and understanding</b>   |                                   |   |  |
| 1.1        | Recognize the continues necessities and the current applicable advances of biomedical sciences.          | K2                                | Lecture, Problem Based Learning             | Discussions                                |
| <b>2.0</b> | <b>Skills</b>  |                                   |   |  |
| 2.1        | Identify healthcare needs and problems for practical and creative solutions.                             | S2                                | Lecture, Group Discussions                  | <b>Case Report</b>                         |
| 2.2        | Integrate contents of different biomedical related sciences in effective and applicable perspective.     | S2                                | Lecture, Group Discussions                  | <b>Case Report</b><br>Discussions          |
| <b>3.0</b> | <b>Values, autonomy, and responsibility</b>  |                                   |   |  |
| 3.1        | Initiate research challenges solutions, innovative ideas and strategies with an entrepreneurial vision.  | V3                                | Group Discussions<br>Problem Based Learning | <b>Presentation.</b><br><b>Case Report</b> |
| 3.2        | Share critical reasoning within the subject area and in relation to the scientific or industrial context | V4                                | Group Discussions<br>Problem Based Learning | <b>Presentation.</b><br><b>Case Report</b> |





## C. Course Content:

| No           | List of Topics  | Contact Hours |
|--------------|---|---------------|
| 1.           | Introduction to the Application in Biomedical Sciences:                                       | 2             |
| 2.           | Translational Biomedical Research   | 2             |
| 3.           | Models in Biomedical Sciences   | 2             |
| 4.           | Biotechnological Applications I: Overview   | 2             |
| 5.           | Biotechnological Applications II: Diagnostics   | 2             |
| 6.           | Biotechnological Applications III: Point of Care Diagnostics                                  | 2             |
| 7.           | Ethical, Legal, and Social Implications of Biomedical Technologies (Discussion)               | 2             |
| 8.           | Nanotechnological Applications in Biomedical Sciences   | 4             |
| 9.           | Biomedical science in Action I: ImmunoTechnology and regenerative medicine                    | 2             |
| 10.          | Biomedical science in Action II: Emerging Trends in Biotechnology I (Students Presentations)  | 2             |
| 11.          | Biomedical science in Action II: Emerging Trends in Biotechnology II (Students Presentations) | 2             |
| 12.          | Biomedical science in Action III: Biotherapeutics   | 2             |
| 13.          | Case Studies and Practical Applications   | 2             |
| <b>Total</b> |   | <b>30</b>     |

## D. Students Assessment Activities:

| No | Assessment Activities * | Assessment timing (in week no) | Percentage of Total Assessment Score |
|----|-------------------------|--------------------------------|--------------------------------------|
| 1. | Group Discussion        | 7 <sup>th</sup> week           | 20%                                  |
| 2. | Presentation            | 14/15 <sup>th</sup> Week       | 40%                                  |
| 3. | Final Case Report       | 18 <sup>th</sup> Week          | 40%                                  |
|    | Total                   |                                | 100%                                 |

\*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

## E. Learning Resources and Facilities:

### 1. References and Learning Resources:

#### Essential References

Liang, Kung-Hao. ***Bioinformatics for biomedical science and clinical applications***. Elsevier, 2013.  
Khan, Firdos Alam. ***Biotechnology in medical sciences***. CRC Press, 2014



|                                 |   |
|---------------------------------|---|
| <b>Supportive References</b>    | N/A   |
| <b>Electronic Materials</b>     | International Journal of Medical Science and Innovative Research<br><a href="#">Saudi Digital Library</a> |
| <b>Other Learning Materials</b> | N/A   |

## 2. Educational and Research Facilities and Equipment Required:

| Items   | Resources   |
|---|---|
| <b>facilities</b><br>(Classrooms, laboratories, exhibition rooms, simulation rooms, etc.) | Traditional classrooms  |
| <b>Technology equipment</b><br>(Projector, smart board, software)                         | Data show, Blackboard and A/V, interactive presentations softwares e.g. <a href="https://www.mentimeter.com/">https://www.mentimeter.com/</a> |
| <b>Other equipment</b><br>(Depending on the nature of the specialty)                      | N/A   |

## F. Assessment of Course Quality:

| Assessment Areas/Issues                            | Assessor   | Assessment Methods   |
|--|--|--|
| <b>Effectiveness of teaching</b>                   | Peer evaluators  | Direct: Peer evaluation  |
| <b>Effectiveness of student's assessment</b>       | Students   | Indirect: Questionnaire Survey at the end of each semester.                        |
| <b>Quality of learning resources</b>               | Program Leaders /Teaching staff/ Development and accreditation committee | Indirect: Review by Department Committee   |
| <b>The extent to which CLOs have been achieved</b> | Program Leaders /Teaching staff/ Development and accreditation committee | Indirect: Review course reports and program annual reports by Department Committee |
| <b>Other</b>                                       | -  | -  |

**Assessor** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods** (Direct, Indirect)





### G. Specification Approval Data:

|                           |                    |
|---------------------------|--------------------|
| <b>COUNCIL /COMMITTEE</b> | Department council |
| <b>REFERENCE NO.</b>      | 06                 |
| <b>DATE</b>               | 21/01/2024         |

