

**Course Description Template for Advanced Pharmaceutical Analyses, 5th Stage, Second Semester (Theoretical)**

**Course Description**

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| • <b>Educational Institution</b>                                                                                                                                                                                                                                                                                                  | <b>Ministry of Higher Education and Scientific Research / Al-Zahrawi University College</b> |
| • <b>University Department / Center</b>                                                                                                                                                                                                                                                                                           | <b>Pharmacy</b>                                                                             |
| • <b>Course Name / Code</b>                                                                                                                                                                                                                                                                                                       | <b>Advanced Pharmaceutical Analyses<br/>PPCS 510</b>                                        |
| • <b>Programs in which it is included</b>                                                                                                                                                                                                                                                                                         | <b>Bachelor of Pharmaceutical Sciences</b>                                                  |
| • <b>Available Forms of Attendance</b>                                                                                                                                                                                                                                                                                            | <b>Daily Attendance</b>                                                                     |
| • <b>Semester / Year</b>                                                                                                                                                                                                                                                                                                          | <b>Second Semester / Fifth year</b>                                                         |
| • <b>Total Number of Study Hours</b>                                                                                                                                                                                                                                                                                              | <b>3 hours weekly</b>                                                                       |
| • <b>Date of preparing this description</b>                                                                                                                                                                                                                                                                                       | <b>2026</b>                                                                                 |
| • <b>Course Objectives:</b> Course Objectives: To study spectroscopic methods used for identification and characterization of organic compounds including UV, IR, Mass and NMR spectroscopy, it enable students to understand the applications of these techniques for qualitative and quantitative analysis of organic compounds |                                                                                             |
| • <b>Learning Outcomes, Teaching and Learning Methods, and Evaluation</b>                                                                                                                                                                                                                                                         |                                                                                             |

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| <ul style="list-style-type: none"> <li>• <b>Knowledge and Understanding</b> <ul style="list-style-type: none"> <li>• Identify all spectroscopic tools for structure elucidation of new drugs.</li> <li>• Applications and interpretation of spectral data</li> <li>• Operating of all spectroscopy instruments</li> <li>• Study of all spectral charts</li> <li>• Writting reports</li> </ul> </li> </ul> |
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| <ul style="list-style-type: none"> <li>• <b>Subject-Specific Skills</b> <ul style="list-style-type: none"> <li>• Acquire skills interpretation of spectral data.</li> <li>• identification of new compounds from their spectra.</li> <li>• Analysis of spectral data.</li> </ul> </li> </ul>                                                                                                                                                                                   |
| <b>Teaching and Learning Methods</b>                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>• Theoretical lectures</li> <li>• Seminars and reports</li> <li>• Laboratory Experiments.</li> <li>• Printing of reports</li> </ul>                                                                                                                                                                                                                                                                                                     |
| <ul style="list-style-type: none"> <li>• <b>Evaluation Methods</b> <ul style="list-style-type: none"> <li>• Semi-semester exams and final exams.</li> <li>• Oral exams</li> <li>• Classroom activities and assignments</li> <li>• Assessment of student work during periodic exams</li> </ul> </li> </ul>                                                                                                                                                                      |
| <ul style="list-style-type: none"> <li>• <b>Thinking Skills</b> <ul style="list-style-type: none"> <li>• The use of modern methods in the preparation of lectures and presentations in the form of PowerPoint</li> <li>• The use of group discussion to understand the article</li> <li>• Giving homework that stimulates and activates thinking and linking information</li> </ul> </li> </ul>                                                                                |
| <ul style="list-style-type: none"> <li>• <b>General and Transferable Skills</b> <ul style="list-style-type: none"> <li>• The student should give interpretation of all spectral charts</li> <li>• The student should be able to employ the knowledge he has received.</li> <li>• Giving confidence to the student through the discussion of seminars.</li> <li>• The student should be able to embody what he has acquired in professional development.</li> </ul> </li> </ul> |

| <ul style="list-style-type: none"> <li>• <b>Course Structure</b></li> </ul> |       |                   |             |          |            |
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| Weeks                                                                       | Hours | Required Learning | Unit Name / | Learning | Evaluation |

|   |   | Outcomes                    | Course or Topic                 | Methods | Method                                                                 |
|---|---|-----------------------------|---------------------------------|---------|------------------------------------------------------------------------|
| 1 | 3 | Knowledge and understanding | UV-Spectroscopy part: 1         | Lecture | Evaluation of application reports, oral and written exams              |
| 2 | 3 | Knowledge and understanding | UV-Spectroscopy part: II        | Lecture | Evaluation of application reports, oral and written exams              |
| 3 | 3 | Knowledge and understanding | IR-Spectroscopy part: I         | Lecture | Evaluation of laboratory skills and lab reports oral and written exams |
| 4 | 3 | Knowledge and understanding | IR-Spectroscopy part : II       | Lecture | Evaluation of application reports, oral and written exams              |
| 5 | 3 | Knowledge and understanding | Mass spectroscopy part:I        | Lecture | Evaluation of application reports , oral and written exams             |
| 6 | 3 | Knowledge and understanding | Mass spectroscopy part: II      | Lecture | Evaluation of application reports, oral and written exams              |
| 7 | 3 | Knowledge and understanding | Mass spectroscopy part: III     | Lecture | Evaluation of application reports, oral and written exams              |
| 8 | 3 | Knowledge and understanding | <sup>1</sup> H-NMR-Spectroscopy | Lecture | Evaluation of application reports, oral and written exams              |
| 9 | 3 | Knowledge and understanding | <sup>1</sup> H-NMR-Spectroscopy | Lecture | Evaluation of application reports, oral and written                    |

|    |   |                             |                                  |         |                                                           |
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|    |   |                             |                                  |         | exams                                                     |
| 10 | 3 | Knowledge and understanding | <sup>1</sup> H-NMR-Spectroscopy  | Lecture | Evaluation of application reports, oral and written exams |
| 11 |   | Knowledge and understanding | <sup>1</sup> H-NMR-Spectroscopy  | Lecture | Evaluation of application reports, oral and written exams |
| 12 |   | Knowledge and understanding | <sup>1</sup> H-NMR-Spectroscopy  | Lecture | Evaluation of application reports, oral and written exams |
| 13 | 3 | Knowledge and understanding | <sup>13</sup> C-NMR-Spectroscopy | Lecture | Evaluation of application reports, oral and written exams |
| 14 | 3 | Knowledge and understanding | <sup>13</sup> C-NMR-Spectroscopy | Lecture | Evaluation of application reports, oral and written exams |
| 15 |   | Knowledge and understanding | <sup>13</sup> C-NMR-Spectroscopy | Lecture | Evaluation of application reports, oral and written exams |

| • Infrastructure                                                              |                                                                                                                                          |
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| <b>Required Readings:</b>                                                     | <b>References:</b> Spectrometric Identification of Organic Compounds, 7th Edition Robert M. Silverstein, Francis X. Webster David Kiemle |
| <b>Special Requirements (Workshops, Journals, Software, Websites):</b>        | <b>Electronic Websites:</b>                                                                                                              |
| <b>Social Services (Guest Lectures, Professional Training, Field Studies,</b> | <b>Organizing workshops and courses for graduates:</b>                                                                                   |

|         |  |
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| Others) |  |
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| • <b>Admission:</b>               |                                         |
| <b>Prerequisites</b>              | Admission according to the central plan |
| <b>Minimum Number of Students</b> | /                                       |
| <b>Maximum Number of Students</b> | Admission exceeds the capacity plan.    |

**Name of the Instructor:**

Dr. Shaker Awad Abdul Hussein