

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

Course Description

Educational Institution	Ministry of Higher Education and Scientific Research / Al-Zahrawi University College
University Department / Center	Pharmacy
Course Name / Code	Advanced Pharmaceutical Analyses PPCS 510
Programs in which it is included	Bachelor of Pharmaceutical Sciences
Available Forms of Attendance	Daily Attendance
Semester / Year	Second Semester / Fifth year
Total Number of Study Hours	3 hours weekly
Date of preparing this description	2026
Course Objectives: 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	
Learning Outcomes, Teaching and Learning Methods, and Evaluation	

Knowledge and Understanding

- Identify all spectroscopic tools for structure elucidation of new drugs.
- Applications and interpretation of spectral data
- Operating of all spectroscopy instruments
- Study of all spectral charts
- Writing reports

Subject-Specific Skills

- Acquire skills interpretation of spectral data.
- identification of new compounds from their spectra.
- Analysis of spectral data.

	No of hrs	Required Learning Outcomes	Lab. Title	Learning methods	Evaluation methods
1	2	Understand the principles and components of a visible spectrophotometer.	Introduction & demonstration to visible spectrophotometry	Practical demonstration & hands-on experiments	Evaluation of application reports, oral and written exams
2	2	Determine the wavelength of maximum absorption (λ_{max}) for a known compound.	2. Absorption spectra of known colored solution	Practical demonstration & hands-on experiment	Evaluation of application reports, oral and written exams
3	2	Identify an unknown compound by comparing its absorption spectrum to a standard.	Absorption spectra of unknown colored solution	Practical demonstration & hands-on experiment	Evaluation of application reports, oral and written exams
4	2	Construct a calibration curve (Beer's Law plot) for a known standard.	Beer's law plot of known solution	Practical demonstration & hands-on experiment	Evaluation of application reports, oral and written exams
5	2	Determine the concentration of an unknown solution using a prepared calibration curve.	Beer's law plot of unknown solution	Practical demonstration & hands-on experiment	Evaluation of application reports, oral and written exams
6	2	Perform a colorimetric assay using $FeCl_3$ for a known tetracycline sample.	Colorimetric assay of tetracycline ($FeCl_3$), known sample	Practical demonstration & hands-on experiment	Evaluation of application reports, oral and written exams
7	2	Quantify the concentration of tetracycline in an unknown sample using the $FeCl_3$ method.	Colorimetric assay of tetracycline ($FeCl_3$), unknown sample	Practical demonstration & hands-on experiment	Evaluation of application reports, oral and written exams
8	2	Perform a colorimetric assay using an acidic	Colorimetric assay of tetracycline (acid), known sample	Practical demonstration & hands-on experiment	Evaluation of application reports, oral

		reagent for a known tetracycline sample.			and written exams
9	2	Quantify the concentration of tetracycline in an unknown sample using the acidic method.	Colorimetric assay of tetracycline (acid), unknown sample	Practical demonstration & hands-on experiment	Evaluation of application reports, oral and written exams
10	2	Perform a colorimetric assay using the maltol reaction for a known streptomycin sample.	Colorimetric assay of streptomycin (maltol, known sample)	Practical demonstration & hands-on experiment	Evaluation of application reports, oral and written exams
11	2	Quantify the concentration of streptomycin in an unknown sample using the maltol method.	Colorimetric assay of streptomycin (maltol, unknown sample)	Practical demonstration & hands-on experiment	Evaluation of application reports, oral and written exams
12	2	Perform a colorimetric assay using an oxidation reaction for a known streptomycin sample	Colorimetric assay of streptomycin (oxidized, known sample)	Practical demonstration & hands-on experiment	Evaluation of application reports, oral and written exams
13	2	Quantify the concentration of streptomycin in an unknown sample using the oxidation method.	Colorimetric assay of streptomycin (oxidized, unknown sample)	Practical demonstration & hands-on experiment	Evaluation of application reports, oral and written exams
14	2	Perform a colorimetric assay using a basic reagent for a known tetracycline sample	. Colorimetric assay of tetracycline (basic, known sample)	Practical demonstration & hands-on experiment	Evaluation of application reports, oral and written exams
15	2	Quantify the concentration of tetracycline in an unknown sample using the basic method.	Colorimetric assay of tetracycline (basic, unknown sample)	Practical demonstration & hands-on experiment	Evaluation of application reports, oral and written exams

Reference text: Lab. Handbook for Advanced Pharmaceutical Analyses adopted by the department.

Name of the Instructor:

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