Course Description Form

1. Course Name:
Advance pharmaceutical analysis (Theoretical+ Practical)
2. Course Code:
Phcls23_528--
3. Semester / Year:
2nd Semester/5th year
4. Description Preparation Date:
15/2/2024
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical (75)/4 units
7. Course administrator's name
Theoretical
Name: Assist. Prof Dr. Moath Kahtan Bashir Email:moathkahtan@uomosul.edu.iq Assist. Prof Dr. Ahmed Abdul-Jabaar Mahmood Email: ahmedsot@uomosul.edu.iq
Practical
Assist. Lec. Raghad Riyadh Khalil Email: raghadalbarhawi@uomosul.edu.iq Assist. Lec. Eman Tareq Mohammed Email: emanpharmacy85@uomosul.edu.iq
8. Course Objectives

Course Objectives Identify the most common pharmaceutical analysis techniques that used for the identification of drugs or chemical compounds.	Ultraviolet spectroscopy UV:presence of the conjugated electron system Infrared spectroscopy IR: identify the presence of the functional groups Nuclear magnetic resonance NMR: identify the carbon hydrogen framework Mass spectrometry : identify the molecular weight and formula of the drugs or chemicals
9. Teaching and Learning Strategies	
Strategy	Lecturing Homework Quiz Practical laboratory demonstrations

10. Course Structure

Week	Hours	Theoretical Required Learning Outcomes	Practical Required Learning Outcomes	Learning method	Evaluation method
1	3+2	UV / visible spectroscopy	Introduction &demonstration to visible spectrophotometry	Theoretical lectures Laboratory experiments	Paper-based exams
2	3+2	UV / visible spectroscopy	Determination of KMnO4/ Beers law	Theoretical lectures	Paper-based exams

				Laboratory demonstration	
3	3+2	UV / visible spectroscopy	Unknown of KMnO4 + Quiz	Theoretical lectures Laboratory demonstration	Paper-based exams
4	3+2	Mass Spectrometry	Colorimetric assay tetracycline using $FeCl_3$	Theoretical lectures Laboratory demonstration	Paper-based exams
5	3+2	Mass Spectrometry	Unknown of tetracycl using $FeCl_3$ method + Quiz	Theoretical lectures Laboratory experiments	Paper-based exams
6	3+2	Infrared Spectrometry	Determination of tetracycli in acidic medium	Theoretical lectures Laboratory demonstration	Paper-based exams
7	3+2	Infrared Spectrometry	Determination of tetracycli in basic medium	Theoretical lectures Laboratory demonstration	Paper-based exams
8	**Mid-term exam**				
9	3+2	Infrared Spectrometry	Colorimetric assay of streptomycin by maltol method	Theoretical lectures Laboratory demonstration	Paper-based exams
10	3+2	Infrared Spectrometry	Colorimetric assay of streptomycin by maltol method	Theoretical lectures Laboratory demonstration	Paper-based exams
11	3+2	Proton NMR Spectrometry	Unknown of streptomycin maltol method + Quiz	Theoretical lectures Laboratory demonstration	Paper-based exams
12	3+2	Proton NMR Spectrometry	IR chart tutorial	Theoretical lectures Laboratory demonstration	Paper-based exams
13	3+2	C13 NMR Spectrometry	IR chart tutorial	Theoretical lectures	Paper-based exams

				Laboratory demonstration	
14	3+2	C13 NMR Spectrometry	IR chart tutorial	Theoretical lectures Laboratory demonstration	Paper-based exams
15	**Students' seminars**				

11. Course Evaluation

- 20 M Theoretical assessment;
  (paper-based mid-term exam + quiz + attendance + seminar)
- 20 M practical assessment (attendance + quiz + practice)
- 60 M paper-based theoretical final exam

100 M total

12. Learning and Teaching Resources

Required textbooks	Spectrometric Identification of Organic Compounds by Silverstein, Bassler and Morrill; Latest edition.
Main references (sources)	Applications of absorption spectroscopy of organic compounds by Dyer JR; Latest edition. Organic Chemistry by McMurry; Thomason learning CA, USA; Latest edition.