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| **1** | **Course title** | Pharmaceutical Chemical Analysis Practical |
| **2** | **Course number** | 1201202 |
| **3** | **Credit hours** | 1 |
| **Contact hours (theory, practical)** | 3 practical hours/week (1 hour online and 2 hours lab works) |
| **4** | **Prerequisites/corequisites** | Pharmaceutical Chemical Analysis, 1201201 |
| **5** | **Program title** | Pharmacy and PharmD |
| **6** | **Program code** |  |
| **7** | **Awarding institution**  | The University of Jordan |
| **8** | **School** | Faculty of Pharmacy |
| **9** | **Department** | Department of Pharmaceutical Sciences |
| **10** | **Level of course**  | Second year |
| **11** | **Year of study and semester (s)** | 2021/2022 First semester |
| **12** | **Final Qualification** |  |
| **13** | **Other department (s) involved in teaching the course** |  |
| **14** | **Language of Instruction** | English |
| **15** | **Teaching methodology** | ☐Blended ☐Online |
| **16** | **Electronic platform(s)** | ☐Moodle ☐Microsoft Teams ☐Skype ☐Zoom ☐Others………… |
| **17** | **Date of production/revision** | 10/10 /2021 |

**18 Course Coordinator:**

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| Name: Ruba Tahsin TarawnehOffice number:107Phone number:06 5355000 - *23343*Email:r.tarawneh@ju.edu.jo |

**19 Other instructors:**

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| Name: Dr. Imad Hamdan Office number: 107 Phone number: 06 5355000 - 23302Email: I.hamdan@ju.edu.joName: Dr. Mohammad Zweiri Office number:Phone number: 06 5355000 - 23365Email:m.Alzweiri@ju.edu.jo |

**20 Course Description:**

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| As stated in the approved study plan.The course describes some basic principles and analysis, with emphasis on titrimetric analysis, tools and methods. Students are required to learn how to experimentally conduct titrations as a method to calculate the amount and concentration of the target unknown. |

**21 Course aims and outcomes:**

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| A- Aims:At the end of this course the student is expected: Acquire basic practical skills and knowledge regarding the importance of analysis in pharmaceutical industry, the proper use of pharmacopoeia, the principles of chemical equilibrium and its relation to pharmaceutical analysis, understand and prepare a buffer system and the concept of titremetric analytical methods and how to employ them in real life problems pertaining the following types of reactions:Acid -basePrecipitation ComplexationOxidation –reductionB- Intended Learning Outcomes (ILOs): Upon successful completion of this course, students will be able to:1. Demonstrate the fundamentals of acid-base and precipitimetric titrations as well as the gravimetric analysis and calculation of the basic statistical parameters, and explain the application of these principles in the analysis of drug substances and understands the concept of buffer systems.
2. Understand the suitable methods for analysis of certain substances depending on basic understanding of physico-chemical properties of the chemical compounds.
3. Understands and interpret the possible interactions or interferences of some chemical compounds with the selected method of analysis of certain compounds depending on the studied principles
4. Understands different analytical procedures for the evaluation of different drugs and for quality control of pharmaceutical preparations
5. Demonstrate knowledge and critical understanding of essential facts, concepts, principles and theories related to the subject areas identified under knowledge and understanding.
6. Demonstrates in practice setting the knowledge and understanding required to meet the needs of patients and other health care professional.
7. Differentiate between different groups of drugs.
8. Apply some technology skills, such as word processing and internet communication and online searches.
9. Demonstrates respect to the instructor and classmates and work effectively with the others as a team during work and while performing the report on the results of an analytical method.
10. Demonstrates time management in an analytical work effectively
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**22. Topic Outline and Schedule:**

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| Topic | Week | Instructor | Achieved ILOs | Evaluation Methods | Reference |
| Orientation | 1  | Ruba Tarawneh | 1-2 | Reports, evaluation, blended learning related assignments and quizzes | Analytical chemistry: An introduction (Saunders Golden Sunburst eries)Author: Donald west, F. James Holler, Douglas A. Skoog , 1997. |
| Laboratory Measurements | 2,3 | Ruba Tarawneh | 1,3 | Reports, evaluation, and quizzes |  |
| Standardization methods | 2,3 | Ruba Tarawneh | 4-7 | Reports, evaluation, and quizzes |  |
| Neutralization Capacity of antacid Tablets | 4,5 | Ruba Tarawneh | 4-7 | Reports, evaluation, and quizzes |  |
| Determination of benzoic acid as raw material + Application of Non-aqueous titration | 4,5 | Ruba Tarawneh | 4-7+1, 3, 8-10 | Reports, evaluation, and quizzes |  |
| Midterm Exam | 6 |  |  |  |  |
| Argentometric Titrations | 7,8 | Ruba Tarawneh | 1, 3, 8-10 | Reports, evaluation, and quizzes |  |
| Compleximetric Titrations | 7,8 | Ruba Tarawneh | 1, 3, 8-10 | Reports, evaluation, and quizzes |  |
| Oxidation-reduction titrations | 9,10 | Ruba Tarawneh | 1, 3, 8-10 | Reports, evaluation, and quizzes |  |
| Buffers and buffer capacity | 9,10 | Ruba Tarawneh | 1, 3, 8-10 | Reports, evaluation, and quizzes |  |
| Final | 11 | Ruba Tarawneh |  | Reports |  |
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* Teaching methods include: In School Lab , blended learning, lab experiments
* Evaluation methods include: Evaluation, Quiz, Mid term Exam, pre-lab quiz…etc

**23 Evaluation Methods:**

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| Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

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| Evaluation | Point % | Date |
| Reports | 10 | For every week |
| Quizzes | 10 | Predetermined quizzes |
| Evaluation based on practical workBlended Learning related activities  | 55 | Prelab quizzes and assignments |
| Midterm Exam | 30 | 14-18/11/2021 |
| Final Exam | 40 | 26-30/12/2021 |

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**24 Course Requirements (e.g: students should have a computer, internet connection, webcam, account on a specific software/platform…etc):**

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| **students should have a computer, internet connection, account on moodle** |

**25 Course Policies:**

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| A- Attendance policies:ObligatoryFirst warning – with 1 absencesLast warning – with 2 absencesFailing in the subject – with 3 absencesB- Absences from exams and handing in assignments on time:Make up exams only for official excuses. C- Health and safety procedures:Should be followed.Described and discussed with students in the first week.D- Honesty policy regarding cheating, plagiarism, misbehavior:The participation , the commitment of cheating will lead to applying all following penalties together1. Failing the subject he/she cheated at
2. Failing the other subjects taken in the same course
3. Not allowed to register for the next semester. The summer semester is not considered as a semester

E- Grading policy:See evaluation methodsF- Available university services that support achievement in the course: |

**26 References:**

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| A- Required book(s), assigned reading and audio-visuals:1) Lab. Manual2) Analytical chemistry: An introduction (Saunders Golden Sunburst eries)Author: Donald west, F. James Holler, Douglas A. Skoog , 1997B- Recommended books, materials and media:Textbook of pharmaceutical analysis. Kenneth A. conors, third Edn. |

**27 Additional information:**

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| **Instructional Mode**This course is taught in a **“blended”** learning environment, meaning students interact with course content, instructors, and peers via in-person lab time and online learning.**Course material and announcements** : students need to use the university website and use e-learning to obtain the material and attend the uploaded videos for demonstrations , report forms and theory requiredIn addition, course related announcements will be posted on this site, it is the responsibility of the students at the beginning of the semester check in the site on a regular basis to obtain the material required for the specified weeks**Grievance policy:**According to the general policies applied at the University of Jordan for grievance when there is a complaint or conflict between a student and an academic/staff member or another student the following procedures must be followed :1. The student writes a formal complaint describing the situation of conflict to the Dean of the School or the President of the University
2. Dean or President will first try to resolve the controversy by meeting/listening to both parties
3. If agreement was not possible, Dean or President forms an investigation committee which will follow, within a specified timeline, the general policies for relevant circumstances. The following points are considered:
4. The committee will meet/talk to both parties and witnesses ( if applicable) within two weeks of conflict
5. All meetings and discussions are documented according to university policies
6. Results/recommendations will be sent to the Dean or President who is responsible for their implementation
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Name of Course Coordinator: -Ruba Tarawneh----Signature: ------------------ Date: 10/10/2021------

Head of Curriculum Committee/Department: ---------------------------- Signature: --------------------------

Head of Department: ------------------------------------------------------------ Signature: -----------------------

Head of Curriculum Committee/Faculty: ---------------------------------------- Signature: -------------------

Dean: ---------------------------------------------------------- Signature: -------------------------------------------