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| **1** | **Course title** | **Pharmaceutical Calculations and Compounding of Dosage Forms- Practical.** |
| **2** | **Course number** | **1202234** |
| **3** | **Credit hours** | **1 hr (Practical)** |
| **Contact hours (theory, practical)** | **3 hr (Practical)** |
| **4** | **Prerequisites/corequisites** | **Pharmaceutical Calculations and Compounding of Dosage Forms (1202230)** |
| **5** | **Program title** | **B.Sc. Pharmacy and PharmD** |
| **6** | **Program code** |  |
| **7** | **Awarding institution** | **The University of Jordan** |
| **8** | **School** | **Pharmacy** |
| **9** | **Department** | **Pharmaceutics and Pharmaceutical Technology** |
| **10** | **Level of course** | **Second year** |
| **11** | **Year of study and semester (s)** | **2020/2021 (first semester)** |
| **12** | **Final Qualification** | **Pharmacy and Pharm D** |
| **13** | **Other department (s) involved in teaching the course** | NA |
| **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** | **16th of October, 2020** |

**18 Course Coordinator:**

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**19 Other instructors:**

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**20 Course Description:**

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| |  | | --- | | ***Description:***  **This course aims to provide the students with good knowledge in calculations, formulation and extemporaneous dispensing, packaging, and storage of medicines. Specifically, solutions, suspensions, emulsions, creams, ointments, and gels as well as suppositories and powders preparations are discussed along with their various types, additives, methods of preparation, common examples, packaging and quality requirements. These extemporaneous preparations include:**  **1. Solutions: Zinc sulphate eye drops BP, Sodium bicarbonate ear drops BP, ephedrine nasal drops BP, Aromatic elixir NF 1980, Simple syrup BP 1980, Codeine linctus BP 1980, Peppermint spirit BP 1980, Iodine tincture USP 1980.**  **2. Suspensions: Menthol and Eucalyptus inhalation BP 1980, Calamine lotion USP 1980, Kaolin mixture BP 1980.**  **3. Emulsions: Mineral oil emulsion USP 1980 (to be prepared in both dry and wet gum methods).**  **4. Creams: Cold cream USP, Vanishing cream BP.**  **5. Ointments: Whitfield's ointment BP, Zinc oxide ointment USP.**  **6. Gels: Clindamycin gel.**  **7. Suppositories: Bismuth subgallate suppositories, Glycerol suppository base BP.**  8. Powders: Applying trituration mixtures in diluting an active ingredient with a suitable diluent when  the total amount of active ingredient required is less than the minimum weighable quantity.  ***Methodology***  ***This Course is offered as a blended learning (BL) course, were Face-to-Face and Rotation models are being utilized. Here the students are directed by their instructor, and asked to study and read, online content (videos, pre session educational material, and sometimes websites) outside the class room, then assessed via online quizzes using the Moodle (e-learning). These activities are done prior to the weekly practical session, and during the 3-hour weekly meeting (practical session) each student is asked to apply/perform the experiment, then discus outcomes/results with instructor and colleagues in the same group and other groups. Students are evaluated by their instructor during the practical session on applying what they had watched prior to session.*** | |

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| A- Aims:  **1- Gaining a sound base for all aspects of good pharmacy practice.**  **2- Managing a laboratory environment, including the correct use and selection of equipment and ingredients.**  **3- Learning how to interpret a prescription and how to extemporaneously compound such a prescription product by putting knowledge into practice.**  **4- Knowledge in calculations, formulation and extemporaneous dispensing, packaging, and storage of medicines.**  B- Course Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to 1- To provide a sound base for all practical aspects of good pharmacy practice.  2- To provide the students with knowledge in pharmaceutical calculations.  3- To provide the students with knowledge concerning fundamentals of extemporaneous dispensing including techniques applied in formulae preparation, packaging, labelling, expiry date and storage conditions of such formulae.  4- To provide the students with knowledge of pharmaceutical dosage forms and the variety of excipients used in pharmaceutical systems with their functions.    5- To provide the students with knowledge on the routes of administration.  **B- Intended Learning Outcomes (ILOs):**  **Upon successful completion of this course students will be able to:**  **• Develop, integrate, and apply knowledge from the foundational sciences in Clinical sciences (learner)**   1. Recall information regarding selected physicochemical concepts, such as intermolecular forces, solubility and physicochemical properties of drug substances. 2. Explain and outline goals of extemporaneous dispensing, aspects of good pharmacy practice and related pharmaceutical calculations. 3. Describe the variety of routes of administration, pharmaceutical dosage forms and their intended use, proper labelling and packaging of medicine and suitable storage conditions. 4. Identify the appropriate technique and equipment as well as selection of suitable excipients required for good compounding of a given formula. 5. Identify any potential mistakes in prescriptions resorting to gained knowledge. 6. Examine a given formula to: define the final obtained dosage form, perform suitable calculations and apply the correct manipulative techniques. 7. Seek proactively new knowledge related to selected dosage forms.   **• Proactively investigates new knowledge, approaches or behaviour and takes steps to evaluate and improve performance (Self-learner)**    **•** **Conduct medication dispensing involving compounding of extemporaneous preparations Drug labeling, packaging** **(Pharmacy system manager)**  **•** **Carry out compounding procedures to produce an effective and safe medicine (Compounder / Pharmaceutical Product Expert (Manufacturer))**    **•** **Communicate effectively with pharmacy personnel (Communicator)** |

**21 Course aims and outcomes:**

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| **22. Topic Outline and Schedule:**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Week** | **Lecture** | **Topic** | **Teaching Methods\*/platform** | **Evaluation Methods\*\*** | **References** | | 1  And  2 | Lab 1  And  Lab 2 | 1-Orintation (Introduction to general laboratory instruction)  2-How to prepare  label?  3-Zinc sulphate eyedrops BP  4-Sodium bicarbonate  5- Ear drops BP   Ephedrine nasal  drops BP  6- Aromatic elixir 7-Simple syrup BP  8-Codeine linctus BP | *6 Videos\*\**  *and word documents about Portfolio preparation and a video includes pre lab material and required information* | Practical Sessions Evaluation, Oral discussion, Assignment,  Pre-lab Assessment (Moodle-based quizzes)  Portfolio( Report),  And Post lab quizzes | Instructor, Reports, student’s manual, Portfolio templates, and model videos | |  |  | |  |  |  |  |  |  | | 3  And  4 | Lab 3 and lab 5 | 1-Peppermint spirit BP.  2- Iodine tincture USP.  3--Menthol and Eucalyptus inhalation BP  4- Mineral oil emulsion USP ( Dry gum method and wet gum method) | Video\*\* about the topic | Practical Sessions Evaluation, Oral discussion, Assignment,  Pre-lab Assessment (Moodle-based quizzes),  Portfolio( Report)  And Post lab quizzes | Instructor, Reports, student’s manual, Portfolio templates, and model videos | | 5 | Lab 4 | Midterm exam  (Practical) | Video\*\* about the topic |  |  | | 6  And  7 | Lab 6  And  Lab 7 | 1-Cold cream USP.  2-Vanishing cream BP  3- Whitfield's ointment BP.  4-Zinc oxide ointment USP. | Video\*\* about the topic | Practical Sessions Evaluation, Oral discussion, Assignment,  Pre-lab Assessment (Moodle-based quizzes) , portfolio report and post lab quizzes | Instructor, Reports, student’s manual, Portfolio templates, and model videos | | 8  and  9 | Lab 8  And  Lab 9 | 1-Bismuth subgallate suppositories BP.  2-Glycerol suppository base BP  3-Phenobarbitone capsule  4-clindamucine gel | Video\*\* about the topic | Practical Sessions Evaluation, Oral discussion, Assignment,  Pre-lab Assessment (Moodle-based quizzes) , portfolio report and post lab quizzes | Instructor, Reports, student’s manual, Portfolio templates, and model videos | |  |  |  |  |  | |  |  |  |  |  |  | | 10  And  11 |  | **Final Exam (practical)** |  |  |  | | 12 |  | **Final Exam (Theoretical)** |  |  |  | | Note: Because **Corona viruses**…. Each section is divided into two groups each group consists from 10 students.  At first week group 1 attend the lab and prepare two weeks experiments. And for the next week they will not attend the lab while group 2 prepare two week experiments.  \*\*\*All videos were pictured and prepared; in the same practical session hall, using the same equipment, tools, and materials, by Ph.Rana alsukhun. Each experiment video contains the practical part pictured inside the laboratory under the same settings that will be used by students. Moreover, all meeting videos were prepared by Ph.Ebtesam Alhawamdeh, which contains theoretical information. | | | | | | |

* Teaching methods include: Synchronous lecturing/meeting; Asynchronous lecturing/meeting
* Evaluation methods include: Homework, Quiz, 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:   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Evaluation Activity** | **Mark** | **Topic(s)** | **Period (Week)** | **Platform** | | 1-Students portfolio reports and assignments | 10 | For each lab | Each week |  | | 2- Evaluation on practical sessions | 10 | For each lab | Each week |  | | 3- Quiz | 10 | For each lab | In week 7 |  | | 4-pre-lab assessment (online quizzes) | 10 | For each lab | Each week |  | | 5- Final Exam | 20 | All material is included | Week 12 |  | |  |  |  |  |  | |

**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, and internet connection)** |

**25 Course Policies:**

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| A- Attendance policies:  ***First warning* – with 1 absences**  ***Last warning* – with 2 absences**  **Failing in the subject – with 3 absences**  B- Absences from exams and submitting assignments on time:  **Will result in zero achievement unless health report or other significant excuse is documented.**  C- Health and safety procedures:  **General Laboratory safety Instruction are maintained**  D- Honesty policy regarding cheating, plagiarism, misbehavior:  **The participation, the commitment of cheating will lead to applying all following penalties together**  **1) 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:  **Evaluation 10 points**  **Quizzes: 10 points**  **reports 10 points**  **Pre-lab assessment 10 points**  **Mid Exam: 20 points ( 20 points practical)**  **Final Exam: 40 points ( 20 point theoretical, and 20 points practical)**  **Total 100 points**  F- Available university services that support achievement in the course:  **1-Laboratory room,**  **2- internet classes** |

**26 References:**

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| A- Required book(s), assigned reading and audio-visuals:  **Laboratory Manual (Pharmaceutical Calculations and Compounding of Dosage Forms)**  B- Recommended books, materials and media:   1. **British Pharmacopeia** 2. **United states Pharmacopeia** 3. **Pharmaceutics: The science of dosage form design (M.E.Aulton, latest edition)** 4. **Pharmaceutical practice (A.J.Winfield and R.M.E.Rishards 1998)**   C- Required equipment:  All equipment, glassware, instruments required to perform assigned experiments. |

**27 Additional information:**

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Name of Course Coordinator: Ph. Ebtesam Alhawamdeh Signature: ------------------ Date:16/10/2020

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

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

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

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