



**Jerash University
Faculty of Pharmacy**

Second semester, 2016/2017

Course Syllabus

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| Course Title: Industrial Pharmacy | Course code: |
| Course Level: | Course prerequisite : |
| Lecture Time: | Credit hours: 3 hours |

Academic Staff

Specifics

| Name | Rank | Office Number and Location | Office Hours | E-mail Address |
|--------------------------------|------------------------|---------------------------------------|-------------------------|-----------------------|
| Dr. Shadi Gharaibeh | Asst. Prof. | 409 | TBA | TBA |

Module description:

This industrial pharmacy course aims to help students develop their knowledge of the theory and its application in the manufacturing of solid dosage forms which include: tablets, hard gelatin capsules, soft gelatin capsules....etc.

Module objectives:

At the completion of the course, students should be able to:

1. Evaluate the steps involved in the manufacturing of the discussed dosage forms.
2. Differentiate between techniques used in the manufacturing of the discussed dosage forms.
3. Identify problems that can be associated with drug manufacturing.

Teaching methods:

Lectures (interactive; group discussion)

Learning outcomes:

At the end of this module, student will be able to:

1. Define and explain the rationale of solid dosage forms.
2. Understand the physicochemical properties of solid dosage form.
3. Explain and illustrate the various materials used in formulation of each dosage form.
4. Understand and practice the different methods of compounding of each dosage form.

Assessment instruments

- Short reports and/ or presentations, and/ or Short research projects
- Quizzes.
- Home works
- Final examination: 40 marks

| <u>Allocation of Marks</u> | |
|---|-------------|
| Assessment Instruments | Mark |
| First examination | 20% |
| Second examination | 20% |
| Final examination: 50 marks | 40% |
| Reports, research projects, Quizzes, Home works, Projects | 20% |
| Total | 100% |

Documentation and academic honesty

- Documentation style (with illustrative examples)
- **Documentation style (with illustrative examples)**
 Submit your home work covered with a sheet containing your name, number, course title and number, and type and number of the home work (e.g. tutorial, assignment, and project).
 Any completed homework must be handed in to my office by 12:00 on the due date. After the deadline “zero” will be awarded. You must keep a duplicate copy of your work because it may be needed while the original is being marked.

You should hand in with your assignments:

- 1- A brief report to explain your findings.
- 2- Your solution of questions.

For the research report, you are required to write a report similar to a research paper. It should include:

- **Abstract:** It describes the main synopsis of your paper.
- **Introduction:** It provides background information necessary to understand the research and getting readers interested in your subject. The introduction is where you put your problem in context and is likely where the bulk of your sources will appear.
- **Methods** Describe your methods here. Summarize the algorithms generally, highlight features relevant to your project, and refer readers to your references for further details.
- **Results and Discussion:** This section is the most important part of your paper. It is here that you demonstrate the work you have accomplished on this project and explain its significance. The quality of your analysis will impact your final

grade more than any other component on the paper. You should therefore plan to spend the bulk of your project time not just gathering data, but determining what it ultimately means and deciding how best to showcase these findings.

- **Conclusion:** The conclusion should give your reader the points to “take home” from your paper. It should state clearly what your results demonstrate about the problem you were tackling in the paper. It should also generalize your findings, putting them into a useful context that can be built upon. All generalizations should be supported by your data, however; the discussion should prove these points, so that when the reader gets to the conclusion, the statements are logical and seem self-evident.
- **Bibliography:** Refer to any reference that you used in your assignment. Citations in the body of the paper should refer to a bibliography at the end of the paper.

- **Protection by copyright**

1. Coursework, laboratory exercises, reports, and essays submitted for assessment must be your own work, unless in the case of group projects a joint effort is expected and is indicated as such.
2. Use of quotations or data from the work of others is entirely acceptable, and is often very valuable provided that the source of the quotation or data is given. Failure to provide a source or put quotation marks around material that is taken from elsewhere gives the appearance that the comments are ostensibly your own. When quoting word-for-word from the work of another person quotation marks or indenting (setting the quotation in from the margin) must be used and the source of the quoted material must be acknowledged.
3. Sources of quotations used should be listed in full in a bibliography at the end of your piece of work.

- **Avoiding plagiarism.**

1. Unacknowledged direct copying from the work of another person, or the close paraphrasing of somebody else's work, is called plagiarism and is a serious offence, equated with cheating in examinations. This applies to copying both from other students' work and from published sources such as books, reports or journal articles.
2. Paraphrasing, when the original statement is still identifiable and has no acknowledgement, is plagiarism. A close paraphrase of another person's work must have an acknowledgement to the source. It is not acceptable for you to put together unacknowledged passages from the same or from different sources linking these together with a few words or sentences of your own and changing a few words from the original text: this is regarded as over-dependence on other sources, which is a form of plagiarism.
3. Direct quotations from an earlier piece of your own work, if not attributed, suggest that your work is original, when in fact it is not. The direct copying of one's own writings qualifies as plagiarism if the fact that the work has been or is to be presented elsewhere is not acknowledged.
4. Plagiarism is a serious offence and will always result in imposition of a penalty. In deciding upon the penalty the Department will take into account factors such as the year of study, the extent and proportion of the work that has been plagiarized, and the apparent intent of the student. The penalties that can be imposed range from a minimum of a zero mark for the work (without allowing resubmission) through caution to disciplinary measures (such as suspension or expulsion).

Taking headlines/notes from the text book with further elaborated/detailed discussion during the lecture.

Course/module academic calendar

| Course Content | |
|-----------------------|---|
| Week | Topics |
| 1 | 1. Preformulation a. Introduction b. Bulk characterization c. Solubility analysis d. Stability analysis |
| 2-5 | 2. Tablets a. Advantages and disadvantages b. Properties and evaluation c. Tablet compression operation d. Processing problems e. Granulation and excipients |
| 5-7 | 3. Tablet coating a. Principles b. Tablet coating processes c. Coated tablet evaluation d. Materials used in coating |
| 7-9 | 4. Hard gelatin capsules a. Materials b. Method of production - filling operations - Formulations - Finishing |
| 9-11 | 5. Soft gelatin capsules a. Methods of manufacture b. Capsule shell c. Capsule content |
| 11-12 | 6. sustained release dosage forms a. Concept b. Theory c. Evaluation and testing |
| 13-14 | 7. Mixing, milling, and drying |
| 15 | 8. Good manufacturing practices |

Expected workload:

On average students need to spend 2 hours of study and preparation for each 50-minute lecture/tutorial.

Attendance policy:

Absence from lectures and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

Module references:

Text book:

- 1. The Theory and Practice of Industrial Pharmacy** , Leon Lachman, Herbert Lieberman, Joseph Kanig, Lea & Febiger, 1986, 3d Edition.
- 2. Martin's Physical Pharmacy and Pharmaceutical Sciences** By : Patrick J. Sinko, Lippincott Williams & Wilkins , 2011, 6th Edition
- 3. Aulton's Pharmaceutics The Design and Manufacture of Medicines**, Edit.: Michael E. Aulton & Kevin M. G. Taylor, Pub.: Churchill Livingstone, 4th edition, 2013.
- 4. Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems** by Loyd V. Allen, Jr. & Howard C. Ansel, Lippincott Williams & Wilkins 10th Edition ,2014

In addition to the above, the students will be provided with handouts by the lecturer.