

نموذج توصيف مقرر أولاً: البيانات العامة

رمز المقرر	اسم المقرر	عدد الوحدات الدراسية		
		نظري	عملي	أخرى
٢٥١ صيد	صيدلانيات - ١ الحسابات الصيدلانية والمحاليل الصيدلانية	٢	١	٣ ٥٠ دقيقة أسبوعين Tutorial

ثانياً: وصف موجز للمقرر

يعتبر هذا المقرر كمقدمة ولقد تم تخطيطه لتقديم المبادئ الفيزيائية الكمية والنظرية لعلوم الكيمياء والفيزياء والرياضيات لدارسي الصيدلة، لمعرفة تطبيقاتها على العلوم الصيدلانية والممارسة الصيدلانية. إن هذا المقرر يعنى بالحسابات الصيدلانية وطرق تحضير المحاليل الصيدلانية. وسيغطي هذا المقرر المواضيع التالية: تفسير الوصفات الطبية وأساسيات القياس وكيفية حساب الجرعات بها- تحضير الوصفات الصيدلانية- الإذابة والتذويب- خواص المحاليل التجماعية وتطبيقاتها العملية- المحاليل الأيونية واتزان المحاليل المتأينة. وأيضاً تركيب وطرق تحضير العديد من المستحضرات الصيدلانية على هيئة المحاليل المائية وغير المائية.

أما الجزء العملي فيتضمن كيفية حساب الجرعات الصيدلانية وتحضير العديد من المستحضرات الصيدلانية على هيئة المحاليل المائية وغير المائية.

ثالثاً: الأهداف العامة للمقرر

(ملخص موجز للمعرفة والمهارات التي صمم المقرر من أجل تطويرها)

١- وصف المعرفة التي سيتم اكتسابها في المقرر: لقد صمم المقرر لمساعدة الطالبات على الفهم والتعامل مع جميع أنواع الوصفات الطبية ومعرفة كيفية قراءتها والقيام بالحسابات الصيدلانية اللازمة لتحضير الوصفات الطبية المختلفة. إضافة إلى معرفة أساسيات المحاليل الصيدلانية والعديد من المستحضرات المائية وغير المائية من حيث الأنواع، طرق التحضير، الاستعمالات، التطبيقات، والمميزات والعيوب.
١- المهارات المعرفية (الإدراكية) المطلوب تطويرها: تطوير مهارة التدريب الميداني المتضمن زيارات الصيدليات العامة والأخرى في المستشفيات وزيارة المصانع الدوائية والغذائية.
٣- مهارات العلاقات البينية (الشخصية) والمسؤولية: أ- تطوير مقدرة الطالبة على الحوار مع الطرف الآخر بطريقة لائقة علمياً وأدبياً واجتماعياً. ب- تنمية مهارة التعامل بتقديرها للرئيس والمرؤوس والزميلات والتواصل معهم. ج- تنمية الاعتزاز والثقة بالنفس عند التعامل مع الآخرين وخاصة المرضى. د- القدرة على مواجهة الصعاب وكيفية التعامل معها واتخاذ الحلول المناسبة. هـ- تعزيز المسؤولية الملقاة على عاتق الطالبة عند حساب الجرعات الدوائية.

<p>٤- مهارات الاتصال، وتقنية المعلومات والمهارات الحسابية (العددية):</p> <p>أ- تحسين مهارة القدرة التعبيرية باللغتين العربية والانجليزية قراءة وكتابة وتحدث من أجل الاتصال بالغير بسهولة.</p> <p>ب- تطوير مهارات استخدام الحاسوب في المجالات الصيدلانية المختلفة.</p> <p>ج- تحسين مهارة الطالبة في الحسابات الصيدلانية لضبط الجرعات.</p>
<p>٥- المهارات الحركية (إن كانت مطلوبة):</p> <p>- تطوير قدرة الطالبة على تشغيل الأجهزة في المعمل وتحمل الساعات العملية الطويلة.</p>

رابعاً: موضوعات - محتوى المقرر

Pharmaceutics -1: PHT. 251 (2+1) Pharmaceutical Calculations, And Pharmaceutical Solutions. Pre-Requisite (105,106 Chem. & 109 Math.)

Course Description

This is an introductory course that is designed to introduce the quantitative and theoretical physical principles of science: chemistry, physics and mathematics to pharmacy students that can be applied to the pharmaceutical sciences and pharmacy practice.

Course Content

The following main subjects will be covered: interpretation of prescription - the fundamentals of measurement and calculation of doses needed in prescriptions - compounding of pharmaceutical preparations.

Solutions and phase equilibria: Solubility and dissolution - Colligative properties of solutions and their practical applications - Ionic solutions and electrolytic equilibria. Study composition of different pharmaceutical dosage forms as aqueous, and non aqueous solutions.

The practical part contains calculation of doses and compounding of aqueous and non aqueous pharmaceutical preparations.

Topics: Credit Hours(h)

I. Pharmaceutical Calculations:(14h)

- Introduction- Numbers and Numerals.
- Interpretation of Prescriptions.
- The Metric System- Measure of Length, Volume, Weight.
- Calculation of Doses – Calculations in miscellaneous Dosage Problems.
- Calculation of Doses for the Pediatric and Elderly Patient:
Dosing Calculations based on Age, Weight, and Body Surface Area.
- Reducing and Enlarging Formulas.
- Density, Specific Gravity, and Specific Volume.
- Percentage and Ratio Strength Calculations.
- Dilution and Concentration of Liquids and Solids.
- The Common Systems and Intersystem Conversion.

II. Solutions and Phase Equilibria - Solubility in Pharmaceutical Systems:(9 h)

- Definition and Pharmaceutical Solvents.
- Solubility of Solid Drugs in Liquids:
 - Expression of Solubility and Rate of Solution.
 - Energetic of Solubility Process, Heat of Solution, Effect of temperature.
 - Effect of Salts on the Solubility of Non- Electrolytes, Solubility of Solution containing two or more Species, Solubility following a Chemical Reaction.
 - Determination of Solubility and Phase Solubility Analysis.
 - Solutions of Liquids in Liquids.
 - Solutions of Gases in Liquids and Thermodynamics of Solution process.
 - Ionic Solutions and Electrolytic Equilibria.
 - Colligative properties of non-electrolytes and electrolytes (meaning and equations).

III. Pharmaceutical Solutions – Dosage Forms:(5h)

- Aqueous Solutions e.g. gargle, Cough Syrups, etc.
- Non-Aqueous Solutions e.g. Glycerites, Elixirs, etc.

- **Exam.(2h)**
- **Total Credit Hours:(30h)**

Laboratory

PHT. 251 (2+1) Pharmaceutical Calculations, And Pharmaceutical Solutions Pre-Requisite (105,106 Chem. & 109 Math.)

Lab. 1.

-The student should be aware about safety requirements while being in the laboratory.

- **Demonstration and practical training** on Pharmaceutical Balances and **demonstration** of Sensitivity Requirement.
- Use of Prescription Balance (weighing technique) and Aliquot Method including Percentage Error and smallest weight Calculations.

Lab. 2.

- Weight systems, Measurement of Pharmaceutical Liquids using different Glass ware.
- Calibration of Dropper.

Lab. 3.

- Reducing and Enlarging Formulas (Solve Problems).
- Percentage and Ratio Strength Calculations (Solve Problems).

Lab.4.

- Allegation alternate (Solve Problems).
- Dilution and Concentration of Liquids (Gentian Violet).

- Dilution and Concentration of Solids (Charcoal & Magnesium Oxide).

Lab.5.

- Study the effect of **Particle Size** on **Dissolution Rate**.
- Solve **Miscellaneous** Problems.

Lab.6.

-Study of Acid-Base Reaction:

- Compounding of Antacid Effervescent Solution.

-Study the effect of temperature on Solubility:

- Preparation of Calcium Lactate solution.

Lab.7.

-Preparation of:

- Soluble Aspirin.
- Preparation of Iron Ammonium Citrate Solution.

Lab.8.

-Preparation of Pharmaceutical Solutions:

- Aromatic waters (Peppermint Water & Camphor Water).

-Demonstration-1:

- Percolation Process for Preparation of Aromatic Waters.

- Demonstration -2:

- Salting out Phenomenon in Peppermint Water.

Lab.9.

- Preparation of pharmaceutical solutions:

- Iodine Solutions: Lugol's (internal use) & Tincture Iodine (external use).
- Tincture Belladonna (internal use).

Lab.10.

- Preparation of Pharmaceutical Solutions:

- Gargle and Mouth Wash (external use).
- Cough mixtures & Diabetic cough syrups (internal use).

Lab.11.

- Preparation of Pharmaceutical Solutions:

- Aromatic Elixir (internal use).
- Cough Elixir (internal use).

Lab. 12.

- Miscellaneous preparations:

- Preparation of Starch Glycerite (external use).
- Phenol Glycerin Ear Drops (external use).

Lab. 13.

- Solve **Miscellaneous** Problems.

Lab. 14.

- **Revision.**

Lab. 15.

- **Practical Exam.**

خامساً: استراتيجيات التدريس

- (١) المحاضرات النظرية التي يلقبها عضو هيئة التدريس ومن في حكمه.
- (٢) الدروس العملية المنعقدة بالمعمل تحت إشراف عضو هيئة التدريس.
- (٣) حلقة المناقشة الجماعية لبعض الموضوعات الهامة.
- (٤) الواجبات والأعمال المنزلية التي تؤديها الطالبة.
- (٥) بحث الطالبة عبر شبكة المعلومات الالكترونية.
- (٦) تأدية بعض الأعمال الجماعية لخدمة المقرر.
- (٧) إعداد التقارير القصيرة من قبل الطالبات.
- (٨) تقديم الطالبة لعروض Power Point.
- (٩) انعقاد Tutorial لمتابعة الطالبة بالمقرر.
- (١٠) مراجعة المقرر الدراسي Revision.
- (١١) وسائل الايضاح المناسبة مثل أشرطة الفيديو والاسطوانات المدمجة وخلافه.

سادساً: أساليب التقويم – طرق تقييم المعرفة المكتسبة

- ١) الامتحانات النظرية القصيرة وغيرها من الامتحانات الفصلية والنهائية.
- ٢) المناقشة الجماعية للأجوبة النموذجية للامتحانات المختلفة.
- ٣) المتابعة المستمرة لتحصيل الطالبة في الدروس العملية.
- ٤) الامتحانات العملية المنعقدة في المعامل والمختبرات.
- ٥) الامتحانات الشفهية المنعقدة للطالبة في **Tutorial**.
- ٦) نوعية طرق العرض الإلكتروني المقدم من الطالبة.
- ٧) طريقة تفكير الطالبة أثناء حل المسائل.
- ٨) مناقشة جماعية للواجبات المنزلية.
- ٩) مناقشة جماعية للتقارير المقدمة.

سابعاً: مصادر التعلم

أ-المصادر الأساسية (كتب ، دوريات علمية ، مواقع انترنت ، أقراص مدمجة)

Principal Textbooks: الكتب الأساسية المقررة

- Pharmaceutical Calculations by Mitchell J. Stoklosa &Howard C. Ansel, Latest Edition.
- Remington's Pharmaceutical sciences, Ed., Alfonso R. Gennaro , Lippincott, Williams & Wilkins, 20th Edition
- British Pharmacopoeia (B.P.).
- United States Pharmacopoeia (USP).
- Pharmaceutical codex.
- British National formulary (BNF).

ب-المصادر الثانوية (كتب ، دوريات علمية ، مواقع انترنت ، أقراص مدمجة)

Supplementary Textbooks: الكتب المساعدة

- Physical Pharmacy by Martin A., Swarbrick J., and Cammarata A. Lea & Febiger, 4th Edition.
- Bentley's Text book of Pharmaceutics, Arthur Owen Bentley and E. Rawlins, Baillidere Tindall, 8th Edition.

Journals:الدوريات العلمية:

- Journal of American Medical Association(JAMA).
- Saudi Pharmaceutical Journal (SPJ).
- New England Journal of Medicine.
- International Journal of Pharmacy.
- British Medical Journal(BMJ).
- Modern Medicine.
- The Pharmacist.
- The Lancet.

Electronic Materials, Web Sites etc. مواقع الانترنت

www.emedicine.com

www.sciencedirect.com

www.blackwell.com

www.pubmed.com

www.ovid.com

Kingdom of Saudi Arabia

**The National Commission for Academic Accreditation &
Assessment**

COURSE SPECIFICATION

Revised March 2007

Course Specification

*For Guidance on the completion of this template, please refer to
of Handbook 2 Internal Quality Assurance Arrangements*

Institution: King Saud University
College/Department: Pharmacy/ Pharmaceuticals

A. Course Identification and General Information

1. Course title and code: Pharmaceutics I: Pharmaceutical Calculations And Pharmaceutical Solutions. PHT 251
2. Credit hours: 3(2+1)
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs): Pharmacy
4. Name of faculty member responsible for the course: Prof. Omaimah M.N. Al Gohary
5. Level/year at which this course is offered: 4/ Second
6. Pre-requisites for this course (if any): (105, 106 Chem. & 109 Math.)
7. Co-requisites for this course (if any): -----
8. Location if not on main campus: -----

B. Objectives

1. Summary of the main learning outcomes for students enrolled in the course.

The students will be able to learn more about calculation of different doses, solubility in Pharmaceutical systems, and Colligative properties of electrolytes and non-electrolytes. The students will Prepare different aqueous and non- aqueous dosage forms.They will be capable to write the labels on the preparations and give the instructions for uses to patients.

2. Briefly describe any plans for developing and improving the course that are being implemented. (eg increased use of IT or web based reference material, changes in content as a result of new research in the field).

The course content were reviewed, and it is noticed that the lectures that covers the Solutions and Phase Equilibria - Solubility in Pharmaceutical Systems (9 credit hours) have been taught and covered in the pre medical year in General Chemistry course. 105 chem.

C. Course description (Note: General description in the form to be used for the Bulletin or Handbook should be attached)

1 Topics to be Covered		
Topic	No of Weeks	Cont act hours
Attached for theoretical and practical(laboratory).		

2 Course components (total contact hours per semester):			
Lectures:28.	Tutorial: 7contact hrs. Solve Problems and evaluation of home assignments.	Practical/Field work/Internship 14 labs. 3contact hrs. / lab. + Practical Exam. 2 contact hrs.	Other: 2contact hrs. Presentation and submission of reports.

3. Additional private study/learning hours expected for students per week. (This should be an average : for the semester not a specific requirement in each week): **2 hrs. for the semester as Revision.**

4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

a. Knowledge

(i) Description of the knowledge to be acquired:

1. knowledge about lab. equipments e.g. balances, glass ware,

etc.

2. Interpretation of prescriptions.

3. Compounding of prescriptions of different dosage forms for internal and external uses.

4. Labelling and instructions to the patients.

5. Solve problems concerning doses, solubility, and colligative properties of electrolytes and non electrolytes, etc.

(ii) Teaching strategies to be used to develop that knowledge

1. Via theoretical” lectures” and practical approaches.

2. Tutorial – solve problems.

3. Reports, homework and use of IT e.g. power point for presentation.

(iii) Methods of assessment of knowledge acquired

1. Written quizzes, mid-terms, final exams, and practical exams.

2. Verbal discussions, and power point presentation.

3. Evaluation of home assignments.

4. Solve problems.

b. Cognitive Skills

(i) Cognitive skills to be developed

1. Critical thinking.

2. Problems solving.

3. Alertness about the doses, and compounding of prescriptions.

4. Precision during directions given to patients.

(ii) Teaching strategies to be used to develop these cognitive skills

- 1. The student should be asked to solve problems.**
- 2. Discussion about the doses, precautions concerning dispensing, instructions for uses of medication.**
- 3. Interpretation of prescriptions should be done by students.**
- 4. Students would offer a summary of certain topics via power point , as well as reports.**

(iii) Methods of assessment of students cognitive skills

- 1. Discussion needs to be presented in groups of students.**
- 2. Compounding of medication in lab. will be evaluated.**
- 3. Attitude of students in lab. will be evaluated.**
- 4. Reports will be presented and will be evaluated accordingly.**
- 5. Presentation of selective topics using power point.**

c. Interpersonal Skills and Responsibility

(i) Description of the interpersonal skills and capacity to carry responsibility to be developed

- 1. Communication with instructors, tutors, staff, and patients.**
- 2. Communication with different personalities and attitudes.**
- 3. Giving indications to patients in a professional way.**
- 4. The student should be engaged in higher responsibilities.**

(ii) Teaching strategies to be used to develop these skills and abilities

<p>1. Students will be trained on simulating situations.</p> <p>2. Video tapes will be used to show students the professional ways of communication with patients and community.</p> <p>3. Oral exams will be made.</p> <p>4. Group discussion will be needed.</p> <p>5. Group projects will be carried out.</p>
<p>(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility</p> <p>1. Monitoring of students' attitudes in lectures and labs.</p> <p>2. Participation of students in the community activities.</p> <p>3. Assessment of home assignments and reports.</p> <p>4. Evaluation of the group projects.</p> <p>5. Monitoring the action/ reaction of students when entitled to higher responsibilities.</p>
<p>d. Communication, Information Technology and Numerical Skills</p>
<p>(i) Description of the skills to be developed in this domain.</p> <p>1. Search utilizing internet to cope with course demand.</p> <p>2. Follow the update knowledge concerning the course demand.</p> <p>3. Presentation using power point.</p> <p>4. Self learning.</p>
<p>(ii) Teaching strategies to be used to develop these skills</p> <p>1. Training on different software and special programs related to the course e.g. labelling of the dosage forms.</p>

2. Students will be asked to present a research project utilizing the I.T. showing the latest information about certain topics.

(iii) Methods of assessment of students numerical and communication skills

1. Evaluation of the extent of comprehension of students in problem solvation.

2. Assessment of home assignments.

3. The positive role of the student in group projects.

4. The effective participation of the student in the activities of his society.

e. Psychomotor Skills (if applicable)

(i) Description of the psychomotor skills to be developed and the level of performance required

1. Alertness of the student during presence in labs.

2. Good management of the students in labs.

3. Performance of proper treatment under stressful circumstances.

4. Level of performance required should meet the international standards.

(ii) Teaching strategies to be used to develop these skills

1. The student should perform a practical demonstration in front of others “colleagues and staff”.

2. Motivation and encouragement from the staff.

<p>3. Audio visual demonstration of different pharmaceutical situations.</p> <p>4. Field visits to community pharmacies.</p> <p>5. Responsibility about medication orders among the family.</p> <p>6. Punctuality.</p>
<p>(iii) Methods of assessment of students psychomotor skills</p> <p>1. Practical exams.</p> <p>2. Oral exams.</p> <p>3. Close supervision of the student during labs.</p> <p>4. Evaluation of students for different assignments.</p>

5. Schedule of Assessment Tasks for Students During the Semester			
Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Proportion of Final Assessment
1	Quiz	2	2
2	Report- verbal discussion	4	2
3	Midterm I	6	15
4	Exhibition of different dosage forms+ Quiz	8	2+2
5	Presentation by Power point	10	2
6	Midterm II	12	15
7	Practical exam	14 or 15	20
8	Final exam	15 or 16	40

D. Student Support

1. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week):

Each staff member should provide the students with 10 specific academic hours per week. In addition to availability of his or her web site.

E. Learning Resources

1. Required Text(s)	Attached
2. Essential References	Attached
3- Recommended Books and Reference Material (Journals, Reports, etc).	Attached
	<ul style="list-style-type: none">- Journal of American Medical Association(JAMA).-Saudi Pharmaceutical Journal (SPJ).- New England Journal of Medicine.- International Journal of Pharmacy.-British Medical Journal(BMJ).- Modern Medicine.- The Pharmacist.

- The Lancet.

4-.Electronic Materials, Web Sites etc.

www.emedicine.com

www.sciencedirect.com

www.blackwell.com

www.ovid.com

www.pubmed.com

5- Other learning material such as computer-based programs/CD, professional standards/regulations

CD for British Pharmacopeia (B.P.), and United States Pharmacopeia (U.S.P). British Pharmaceutical Codex (B.P.C). Martindale (extra pharmacopeia).

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Lecture rooms, laboratories, etc.)
 - **Number of seats in each classroom would be up to 100 seats.**
 - **Number of seats in each laboratory would be up to 25 seats.**

2. Computing resources

- **Computer access in each classroom would be 2.**

- **Computer access in each laboratory would be 8.**

3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list).

Balances (one per student) - Shaking water baths (one per 5 students) - Sonicator water baths (one per 10 students) - Sand baths (one per 5 students)- pH Meters (one per 10 students)- Glass wares(all types and sizes) – Mortars and pestles (porcelain and glass), one of each type per student.

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching.

- **Questionnaire is given to students to be filled about course content and teaching Procedures.**

-**Evaluation of standards of the students in the quizzes, midterms, final exams, and home assignments, reports, and presentations.**

2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department.

- **Verbal discussion Should be done by the staff member in presence of students about course content and teaching Procedures, in order to express the extent of comprehension and understanding.**

- **Discussion of the model answer of the written exams- quizzes& midterms- with the students to review their answers.**

- **listening to students' complaints.**

3. Processes for Improvement of Teaching

The department should have an out patient pharmacy as a model, to help students in understanding the courses that are related to pharmacy practice. Especially when it is difficult to practice the knowledge in Hospitals or community pharmacy.

4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)

Check marking of a sample of student work by the demonstrators and lecturers working in the same course.

5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Establishing an academic committee in each department to control :

Periodical reviewing of the course content, midterms, final exams, students' complaints, time factor, discipline, attendance of students and tutors.

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J

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- British Medical Journal(BMJ).
- Modern Medicine.
- The Pharmacist.
- The Lancet.

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