ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Medicinal Chemistry and Quality Control

1805528-2

Course Specifications
(CS)

Course Specifications

Institution: Beni-suef	Date of Report: 20-8-1436
College/Department: Faculty of pharmacy	

A. Course Identification and General Information

1. Course title and code: Medicinal Chemistry and Quality Control (1805528-2)
2. Credit hours: 2
3. Program(s) in which the course is offered. Both B.Pharm and Pharm D program
4. Name of faculty member responsible for the course: Ahmed Gouda, Dr. Munjed Salem, Dr. Eman Beshr and Dr Nashwa Mansour
5. Level/year at which this course is offered: 5th level (5th year) / 1435-1436
6. Pre-requisites for this course (if any): None
7. Co-requisites for this course (if any): None
8. Location if not on main campus:
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	√	What percentage?	
b. Blended (traditional and online)	√	What percentage?	
c. e-learning	√	What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course?

1. course description and topics to be covered in this course

This course is offered to 5th year, 2nd semester B.Pharm and Pharm.D Students. It is a 2 credit hours (2 hours lecture per week). The course is completed in one semester; which is of about 15 weeks duration. The course focuses on different classes of drugs including those used in cardiovascular disorders (diuretics, ACEIs, calcium channel blocker, antianginal, antiarrhythmic, and antihypercholesterolemic), in addition to drug classes used in endocrine function disorders such as thyroid disorders and diabetes mellitus, steroid hormones (include male, female and corticosteroids). Study of chemical structures and methods for preparations of the selected drug classes will be also introduced. The mechanism of action, metabolic pathways and structure activity relationship of each group of the selected drugs will be illustrated. The principles for some quality control methods applied for selected drugs will be discussed.

Objectives of the course are:

To enable the student to:

1. Demonstrate knowledge of drug classes and understand the chemistry of these classes.
2. Understand the mechanism of action of selected drugs and recognize different types of interactions with biological targets.
3. Predict the biological response, from the chemical structure of the discussed drugs.
4. Apply SAR in evaluating drugs activity.
5. Understand the effect of drug pharmacokinetics on therapeutic application.
6. Predict major metabolic pathway and metabolites of some drugs from their chemical structure.
7. Suggest plausible approaches to avoid undesirable side effects of selected drugs.
8. Relate medicinal chemistry of the discussed drugs to their clinical applications.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)
   Supervisors of each course ask their students to search the online data base, gather the essential references needed for their research project.

In medicinal chemistry IV course we aimed to increase student use of IT. Each students group were given one cases study online. They have to read each case and answer 10 MCQ questions within 45 minutes. After completing their answers they have to submit their answers to receive and revise the assessment reports.

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				
Week	**Date**	**List of Topics**	**Lecture (lecturer)**	**Contact Hours**
1	9-4-1436	Introduction (Dr Ahmad Gouda)	Introduction (Dr Ahmad Gouda)	2
2	16-4-1436	Antihypertensive (Diuretics 1) (Dr Ahmad Gouda)	Antihypertensive (Diuretics 2) (Dr Ahmad Gouda)	2
3	23-4-1436	Antihypertensive (Diuretics 3) (Dr Ahmad Gouda)	Antihypertensive (ACEIs 1) (Dr Ahmad Gouda)	2
4	30-4-1436	Antihypertensive (ACEIs 2) (Dr Ahmad Gouda)	Antihypertensive (ACEIs 3) (Dr Ahmad Gouda)	2
5	7-5-1436	Antihypertensive (Calcium Channel Blockers) (Dr Ahmad Gouda)	Cardiac Agents (Antianginal) (Dr Ahmad Gouda)	2
6	14-5-1436	(Antiarrhythmics 1) (Dr Ahmad Gouda)	(Antiarrhythmics 2) (Dr Ahmad Gouda)	2
7	21-5-1436	Antihypercholesterolemic 1 (Dr Munjed Salem)	Antihypercholesterolemic 2 (Dr Munjed Salem)	2
8	28-5-1436	Thyroids 1 (Dr Munjed Salem)	Thyroids 1 (Dr Munjed Salem)	2
9	**Spring holiday**			
10	13-6-1436	Insulin and antidiabetics 1 (Dr Munjed Salem)	Insulin and antidiabetics 2 (Dr Munjed Salem)	2
11	20-6-1436	Steroidal Drugs 1 (Dr Ahmad Gouda)	Steroidal Drugs 2 (Dr Ahmad Gouda)	2
12	27-6-1436	Steroidal Drugs 3 (Dr Ahmad Gouda)	Steroidal Drugs 4 (Dr Ahmad Gouda)	2
13	4-7-1436	Steroidal Drugs 5 (Dr Ahmad Gouda)	Steroidal Drugs 6 (Dr Ahmad Gouda)	2
14	11-7-1436	Steroidal Drugs 7 (Dr Ahmad Gouda)	Steroidal Drugs 8 (Dr Ahmad Gouda)	2
15	18-7-1436	Steroidal Drugs 9 (Dr Ahmad Gouda)	Steroidal Drugs 10 (Dr Ahmad Gouda)	2
16	25-7-1436	Final theoretical Exams		
17				
18				

2. Course components (total contact hours and credits per semester):				
	Lecture	Tutorial	Other:	Total
Contact Hours	2	2 hours (once)	2 for each group (seminar)	4
Credit				

3. Additional private study/learning hours expected for students per week.	√
Training sessions on the presentation of the research article	

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
	Knowledge skills to be developed:	Lectures Recitation oral questions Class discussion Oral presentation Case studies	1. One midterm exam 2. Online case study quizzes 3. Oral presentation 4. Final written exam
1.1	Identify the mechanism of action of certain drugs		
1.2	Relate drug activity and uses with chemical structure		
1.3	Identify the major metabolic pathways of some drugs		
1.4	Know some of the examples of drug in clinical use.		
2.0	**Cognitive Skills**		
	Cognitive skills to be developed:	Lectures Recitation oral questions Tutorial. Class discussion Oral presentation Case studies	1. One midterm exam 2. Online case study quizzes 3. Oral presentation evaluation forms 4. Final written exam
2.1	Describe certain pharmaceutical classes used in drug therapy		
2.2	Recognize the effects of chemical structure on drug activity		
2.3	Predict the biological activity from the structure		
2.4	Relate pharmacokinetic with chemical structure of some drugs		
2.5	Read and evaluate cases.		
2.6	Compare alternative drugs and decide which to use/select.		
2.7	Explain how to avoid side effects in some drugs		
2.8	Predict some of the drug-drug interactions and how to avoid		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Perform effective communication and positive relation with others and be able to work as an effective member in a team.	Lectures Recitation oral questions Tutorial. Class discussion Oral presentation Case studies	1. Oral presentation Two case study quizzes 2. Final written exam
3.2	Apply the ethical and professional standard during the work in a team		
4.0	**Communication, Information Technology, Numerical**		
4.1	Use technology in collecting information.	Oral presentation Case studies	1. Online case study quizzes 2. Oral presentation using ppt
4.2	Use technology in communication skills with others		
5.0	**Psychomotor**		
5.1	NA		

Check mapping of Course Learning Outcomes in with Assessment Methods (item No 12)

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task	Week Due	Proportion of Total Assessment
1	Midterm exam	8th	20%
2	Online case study quiz	13th	10%
	Presentation of a research article	14th	10%
4	Final examination (30 marks)	End of semester-2	60%

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

1. Availability of teaching staff for consultations and advice:.

a) Course coordinator and lecturers of the course are happy to answer all students' quires during or after the lectures, and they can be reached by personal meeting, phones or e-mails.
b) Student representative (group leader) usually has the mobile number of the course coordinator to contact him in case of any queries.
c) All students have the e-mail of the course coordinator.
d) Office hours for the course coordinator and lecturer of the course are given to students; this is at least 2 hours per week for each group divided into two days.
e) All contact information of the teaching staff are available in the handout.

2. Lecturer responsibilities:

Lecturer is expected to:

a) Provide clear and informative lecture notes with learning objectives that focus on important points,
b) Give clear, informative, and stimulating 45-minute lectures with PowerPoint or other visual aids to enhance the learning experience for students.
c) Answer questions either in or outside class or via e-mail or telephone.
d) Compose thoughtful and fair exam questions that assess student learning and application of the course content.
e) Directing the case sessions and facilitators to provide an effective learning experience in small group, team-oriented sessions.
f) Providing answers and explanations to student inquiries regarding any aspect of the course.
g) Providing advice and assistance to students for improving their learning strategies and performance in the course.
h) Reviewing and implementing appropriate changes in the course based on student feedback and evaluations.

3. Students responsibilities:

Students are expected to:

1. Use all available resources to accomplish the learning objectives in each lecture and case-based discussion and exercise session, including:
   a. Attending all lecture and case-based discussion sessions.
   b. Reading textbook assignments.
   c. Participating in lecture and case sessions by answering questions posed in class and asking questions when information is unclear or more information is needed.
   d. Performing assigned exercises working individually or in groups, as directed.
   e. Submitting completed assignments/reports/presentation on or before the stated deadlines for timely feedback.
   f. Asking for help from the course coordinator when they need it or even think they might need it.
2. Notify the course coordinator as soon as they can if they are seriously ill or have an emergency that prevents them from attending the lecture, case sessions or an exam.
3. Provide constructive feedback regarding the course on evaluation forms.
4. Adhere to the faculty academic and professional rules.
5. Recognize that the study of drug chemistry is critically important and is totally fun.

E. Learning Resources (for supervisors)

1. List Required Textbooks

Foye's Principles of Medicinal Chemistry (2007) by David A. Williams and Thomas L. Lemke, Publisher: Lippincott Williams & Wilkins.

2. List Essential References Materials (Journals, Reports, etc.)

1. **Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry (2003)** by John H. Block and John M. Beale (Editors) Publisher: Lippincott Williams & Wilkins.
   - Offers the reader to understand:
   - How do drugs have their effect in the human body?
   - an engaging insight into the one field of chemistry which arguably has the greatest impact on our quality of life than any other
   - critical reviews of important topics in medicinal chemistry
2. **Practical Pharmaceutical Chemistry** by Beckett AH, Stenlake JB, Publisher: Athlone Press, London, UK

- Offers the reader a practical understanding of pharmaceutical chemistry.
- **Burger's Medicinal Chemistry and Drug Discovery® 6th ed. (2003), by** D. Abraham (editor), Publisher: John Wiley & Sons
- **Pharmaceuticals, Vol. 1, 2, 3 and 4** by McGuire JL (Editor) Publisher: WILEY- VCH
  - These are popular books provide a fairly concise overview of medicinal chemistry.

They provide timely and critical reviews of important topics in medicinal chemistry

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

1. **Martindale: The Complete Drug Reference (2008)** Prepared by the editorial staff of the Royal Pharmaceutical Society of Great Britain and Edited by Sean Sweetman
   It is a trusted source for medicines information for over 120 years. Worldwide coverage and unbiased, reliable and evaluated information on drugs and medicines.
2. **British Pharmacopoeia (2008)** by British Pharmacopoeia Commission (The Stationery Office, London, UK)
3. **United States Pharmacopoeia 31 - National Formulary 26 (2008)** by United States Pharmacopeial Convention

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- https://www.facebook.com/medicinal.chemistry1
- http://www.freebookcentre.net/chemistry-books-download/Medicinal-chemistry-lecture-notes.html
- http://www.utexas.edu/pharmacy/courses/phr452d/
- http://www.freebookcentre.net/Chemistry/Medicinal-Chemistry-Books.html

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

Students are asked to use Microsoft word program, Excel program and PowerPoint program. They are also encouraged to use some mind map computer software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Class rooms provided with the white board, data show are available in the faculty of pharmacy. The class rooms are ear conditioned and each class can accommodate at least 80 students.
2. Computing resources (AV, data show, Smart Board, software, etc.) One Data show, one in each section for the presentation of the lectures and another one in the lab (for the oral presentation). Computer labs are available in the faculty of medicine library but there is no WI-FI or internet connections the labs
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) ----------

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
Feedback is obtained from different survey applied 1. Online course survey 2. Online staff member evaluation survey ▪ These surveys are used to measure the student's feedback about the quality of teaching and course contents. Information in this feedback form is treated confidentially and students are not asked to write their names in it. ▪ Results of the staff member evaluation survey and course survey are given to the course coordinator
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor
Any complain from students about the quality of teaching and/ or course contents are always treated confidentially and considered and discussed well to find the suitable solutions. In addition, the department represented by the head of the department follow-up the performance and achievements in the teaching process and students can contact the head of the department directly (handout) to show their feedback or to get help regarding any problems arising during the whole semester.
3 Processes for Improvement of Teaching
Department teaching staff are always encourage to update their knowledge in the field of work by attending national and international conferences and self developments courses held inside or outside the university campus and a record of that is kept for each academic staff covering this area.
4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent
All students exam are designed to be corrected and marked by computer program (when possible)to minimize the human errors. In addition, the exam papers are usually marked by at least two different members of the teaching staff according to the model answer and marking schemes (exam portfolio).

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

- The course content are reviewed and updated annually at the beginning of each academic year by the department curriculum committee and any major changes are reported to the college curriculum committee.
- Rearrangement of topics in this course was done and was applied from the current semester.

Other recommended action plan

1. To perform a complete benchmarking for the 4 medicinal chemistry courses
2. Applying the external evaluation of learning resources and examination papers

Teaching Staff: Ahmed Gouda, Dr. Majdi Bkhitian, Dr. Eman Beshr and Dr Nashwa Mansour

Signature: _____ **Date Report Completed:** _____

Received by: _____ **Dean/Department Head**

Signature: _____ **Date:** _____

All students exam are designed to be corrected and marked by computer program (when possible)to minimize the human errors. In addition, a member from an institution other from the university is asked annually to join in teaching and assessing the students.