



Sohag University



Faculty of pharmacy

Quality Assurance Unit

Course Specifications

University: Sohag

Code: (PT 302)

Title: Controlled Release Dosage Forms

Course Specifications

Program (s) on which the course is given: Bachelor of pharmaceutical sciences

Department offering the program: Pharmaceutics and Industrial Pharmacy

Date of specification approval 2015/2016

A- Basic Information

Prerequisites: Dosage form 1, Dosage form 2.

Credit Hours: 4

Lecture: 2

Tutorial: 0

Practical: 2

Total: 4

B- Professional Information

1- Overall aims of course

The course aims at providing the students with knowledge of the sustained and controlled release drug delivery systems.

Intended learning outcomes of course (ILOs)

Knowledge & Understanding Skills

1- Recognize the overall aim of the course and the different aspects of oral sustained release drug delivery formulation

2- Discuss the difference between immediate-release and modified release dosage forms, the advantages and disadvantages of sustained release dosage forms, limitations of controlled release dosage forms, different drugs unsuitable for controlled release dosage forms, reservoir and matrix dissolution controlled release dosage forms, types of reservoir and matrix diffusion controlled release dosage forms, chemical controlled release dosage forms, miscellaneous methods used for oral controlled release dosage forms and the advantages and disadvantages of osmotic oral controlled release dosage forms.

3- Recognize the different aspects of oral sustained release drug delivery formulation, the kinetics of release from different types of controlled release dosage forms, release kinetics of different oral controlled release dosage forms, mechanism of action of drug release from osmotic and chemically controlled dosage forms, design and release pattern from different depot parenteral dosage forms and implants, properties of ideal polymers used in controlled release dosage forms, design and release pattern from different rectal and vaginal dosage forms and design and release pattern from different commercially available intranasal and intraocular controlled release dosage forms

4- Describe different types of controlled release oral dosage forms, mode of action osmotic-controlled release dosage forms, osmotically controlled release dosage forms, design and

release pattern from elementary osmotic pump and push pull osmotic systems, different polymers that can be used in developing controlled release dosage forms, release pattern from ocular inserts, how to enhance transdermal drug delivery, different methods used for achieving controlled release from transdermal dosage forms, different methods used for microencapsulation, liposomes and discuss their use in controlled drug delivery, nanoparticles and discuss their use in controlled drug delivery, drug targeting through the use of prodrugs, antibodies and resealed erythrocytes, different methods used for tumor targeting and methods used for characterization of prepared liposomes.

5- Identify the process of microencapsulation.

Professional Skills

- 1- Demonstrate the drug release from different non immediate release dosage forms, different barriers affecting drug absorption from oral route
- 2- Explain the importance of controlled release dosage form, effect of half-life, absorption metabolism, margin of safety and therapeutic effects on the design of sustained release dosage forms, effect of dose size ionization, pka and aqueous solubility partition coefficient and drug stability on the design of sustained release dosage forms and disadvantages of oral drug delivery route
- 3- Illustrate the advantages and disadvantages of different methods used for microencapsulation, different types of liposomes, advantages and disadvantages of different types of liposomes, commercially available liposomal formulations and different types of nanoparticles.

Intellectual Skills

- 1- Differentiate between controlled release dosage forms and sustained release dosage forms, controlled and prolonged release dosages forms, repeat action dosage forms and site specific release dosage form, biological and physicochemical factors affecting the design of sustained release dosage forms and different types of parenteral controlled release dosage forms
- 2- Distinguish the different types of polymers used in controlled release dosage forms, types of rectal, vaginal and uterine controlled release dosage forms, polymers with different solubility behavior used in design of controlled release dosage forms, different types of intranasal and intraocular controlled release dosage forms
- 3- Illustrate the advantages and disadvantages of reservoir and matrix dissolution controlled drug delivery systems, advantages and disadvantages of reservoir and matrix diffusion controlled drug delivery systems.
- 4- Compare between different routes of drug administration, differences between dissolution, diffusion controlled drug delivery systems and the factors affecting drug delivery through transdermal route of administration.
- 5- Choose examples of commercially available oral controlled release dosage forms.
- 6- Evaluate different phospholipids used formulation
- 7- Interpret some commercially available transdermal controlled release dosage forms.

General & transferable Skills

Week No	Topic	Lectures (hours)
W1	Introduction to the course	2
W2	Biological and physicochemical factors affecting the design of SRDF	2
W3	Oral controlled delivery systems	2
W4	Oral controlled delivery systems (cont.)	2
W5	Oral controlled delivery systems (cont.)	2
W6	Oral controlled delivery systems (cont.) + Quiz No. 1	2
W7	Parenteral drug delivery systems + Mid-Semester Exam	2
W8	Polymers	2
W9	Rectal and Intra-vaginal drug delivery systems	2
W10	Intraocular drug delivery systems	2
W11	Microencapsulation	2
W12	Transdermal drug delivery systems	2
W13	Liposomal drug delivery systems	2
W14	Drug targetting	2
W15	Quiz No. 2	2
W16	Final Examination	
Total		28

6- Teaching & learning methods

- 1- Lectures
- 2- Discussion Sessions
- 3- Practical Assignments

4 -Student assessment methods

Assessment schedule

Written quizzes 2nd, 4th, 10th, 12th week

Class activities (reports, discussions, practical)

Practical Exam: 15th week

Med – Term Exam: 7th week

Written final: Exam 16th to 16th week *

Oral Exam: 16th to 16th week*

Weighing of assessments

- Written exams to assess the knowledge and understanding of intellectual and professional skills
- Oral exams to assess intellectual, general skills of analysis, scientific thinking as well as scientific discussion
- Practical exam to assess professional and practical skills
- Periodic exams to assess the knowledge, understanding, intellectual and professional skills
- Final – term examination

6-List of references

6, 1- Course notes

Material supplied by the lecturer: power point presentations of the course, question bank in terms of questions put on the slides whenever appropriate, pdf on different topics of the course and case studies in the practical part.

6, 2- Essential book (text books)

- Controlled drug delivery system – Vicent H.L., Marcel Dekker Second Edition
- Chien, Y.W.: Novel Drug Delivery Systems, Marcel Dekker, New York and Basel

6, 3- Recommended books

- Remington's pharmaceutical sciences. 21 st Edition, Lippincott Williams and Willkins-Vol. I & II
- Novel drug delivery system – Marcel Dekker N.Y. Second Edition, Revised and Expanded by Yie W. Chien. Vol- 50. Revised and Expanded by J. R. Robinson and Vincent H. L. Lee. Vol- 29.
- Bentley's textbooks of pharmaceuticals – E.A. Rawlin
- Novel and controlled drug delivery systems – N.K. Jain
- Advances in Novel and Controlled Drug Delivery- N.K. Jain
- Robinson, J.R. & Lee, V.H.I.,: Controlled and Novel Drug Delivery Marcel Dekker, New York.

6, 4- Periodicals, Web sitesetc

Many pharmaceutical journals, e.g., J. Cont. Rel , J. Pharm. Sci., Int J. Pharm and Drug Dev Ind Pharmacy. The most concerned web sites are those of the FDA, ICH and WHO who contentiously issuing guidelines on the subject.

7- Facilities required for teaching & Learning

Computer / data show / OHP / White board

7- Facilities required for teaching & Learning

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Course coordinator:- Ass.Prof. Dr/ Mahmoud M. Ahmed Elsayed

Head of Department: Ass.Prof. Dr / Mahmoud M. Ahmed Elsayed

Date: 15/9/2015