The University Of Toledo

New Graduate Course Proposal

* denotes required fields

1. College*: College of Pharmacy
   Department*: Pharmacy Practice

2. Contact Person*: Sai HS, Boddu
   Phone: 383-1959 (xxx - xxxx)
   Email: sboddu@utnet.utoledo.edu

3. Alpha/Numeric Code (Subject area - number)*: PHPR - 5770

4. Proposed title*: Advanced Drug Delivery S
   Proposed effective term*: 201410 (e.g. 201140 for 2011 Fall)

5. Is the course cross-listed with another academic unit?  ○ Yes  ○ No
   Approval of other academic unit (signature and title): 

   Is the course offered at more than one level?  ○ Yes  ○ No
   If yes, an undergraduate course proposal form must also be submitted. If the undergraduate course is new, complete the New Undergraduate Course Proposal; if the undergraduate course is existing, submit an Undergraduate Course Modification Proposal.

6. Credit hours*: Fixed: 3
   or Variable:

7. Delivery Mode:
   a. Activity Type *
      Primary* Lecture
      Secondary ~SelectType--
      Tertiary ~SelectType--
   b. Minimum Credit Hours *
      Maximum Credit Hours *

Date Added: 5-9-13
Council Approved: 10-15-13
To Provost: 10-29-13

https://curriculumtracking.utoledo.edu/GradNewCourse.aspx?Mode=View&ID=PHPR5770

1/3
c. Weekly Contact Hours *

8.
Terms offered: □ Fall □ Spring □ Summer

Years offered: ○ Every Year ○ Alternate Years

9. Are students permitted to register for more than one section during a term? ○ No ○ Yes

May the courses be repeated for credit? ○ No ○ Yes Maximum Hours

○ Passing Grade/No Credit (A-C, NC)
○ Credit/No Credit
○ Grade Only (A-F, PR, I)
○ Audit Only
○ No Grade

11. Prerequisites (must be taken before): i.e. C or higher in (BIOE 4500 or BIOE 5500) and C or higher in MATH 4200

○ PIN (Permission From Instructor) ○ PDP (Permission From Department)

Co-requisites (must be taken together):

12. Catalog Description* (75 words Maximum)

Special emphasis will be made on the role of various efflux and influx transporters in drug delivery. The course design is based on the premise that the student desires knowledge about the latest developments in formulation and drug delivery.

13. Attach a syllabus and an electronic copy of a complete outline of the major topics covered. Click here for template.

File Type View File

https://curriculumtracking.utoledo.edu/GradNewCourse.aspx?Mode=View&ID=PHPR5770
Course Approval:

Department Curriculum Authority: [Signature] Date 2/15/2013

Department Chairperson: [Signature] Date 4/18/13

College Curriculum Authority or Chair: [Signature] Date 4/25/13

College Dean: [Signature] Date 4/18/2013

Graduate Council: [Signature] Date 10-15-2013

Dean of Graduate Studies: [Signature] Date 10-15-2013

Office of the Provost: [Signature]

Administrative Use Only

Effective Date: [Date] (YYYY/MM/DD)

CIP Code:

Subsidy Taxonomy:

Program Code:

Instructional Level:

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https://curriculumtracking.utoledo.edu/GradNewCourse.aspx?Mode=View&ID=PHPR5770
Advanced Drug Delivery Systems-I  
SPRING, 2014

COURSE SYLLABUS

Course Coordinator: Dr. Sai HS. Boddu

Additional Course Instructor: Dr. Jerry Nesamony

Faculty Office: HEB 114G

Office Hours: SEE POSTINGS ON OFFICE DOOR

Phone: 419-383-1959  
E-Mail: sboddu@utnet.utoledo.edu

Class Meetings: TBD

COURSE GOALS

The development of drug delivery systems relies on the broad understanding of many different physiological, chemical, and biological factors. This course is designed to introduce advanced polymeric and lipid based drug delivery systems for oral, ocular, transdermal and otic delivery. Special emphasis will be made on the role of various efflux and influx transporters in drug delivery. The course design is based on the premise that the student desires knowledge about the latest developments in formulation and drug delivery.

LEARNING GOALS OF COURSE

Students completing the Advanced Drug Delivery Systems-I course will be able to demonstrate the following competencies:

1. Recognize the benefits of novel drug delivery systems in enhancing specific availability of the drug and preventing adverse side effects.
2. Differentiate various routes of drug administration and peculiarities of drug delivery systems designed for the specific route.
3. Understand the concept, types of targeted drug delivery and advantages of drug targeting to specific organs, tissues, intracellular organelles or molecules.

COURSE MATERIAL

1. Handouts and additional problem sets may be distributed in class.
5. Jain, N.K.: Controlled and Novel Drug Delivery, CBS, Delhi
8. Jain N. K. Pharmaceutical Product Development, CBS Publisher, Delhi

CLASSROOM POLICIES & PROCEDURES

♦ The University of Toledo Missed Class Policy

Students are expected to attend every class meeting of courses in which they are registered. Only in specific, unavoidable situations does the University excuse absences from class: 1) personal emergencies, including, but not limited to, illness of the student or of a dependent of the student [as defined by the Board of Trustees' Policy on Family and Medical Leave], or death in the family; 2) religious observances that prevent the student from attending class; 3) participation in University-sponsored activities, approved by the appropriate University authority, such as intercollegiate athletic competitions, activities approved by academic units, including artistic performances, R.O.T.C. functions, academic field trips, and special events connected with coursework; 4) government-required activities, such as military assignments, jury duty, or court appearances; and 5) any other absence that the professor approves.

Students are responsible for complying with the missed class policies of their instructors. Students bear the responsibility of notifying the instructor of a planned absence by one of the methods provided by the instructor. In the event of an emergency or an unavoidably short notice of absence, the student must present the instructor with an approved written excuse upon the student’s return to class. Approved written excuses will be at the instructor’s discretion, including, but not limited to, doctor's notice, funeral programs, etc. It is strongly recommended that the student use two of the three aforementioned methods (email, writing, or voicemail) to insure that the instructor is properly notified of the planned absence. In the event that the instructor should not receive the student’s notification, the student should be prepared to present an alternative excuse. It will be at the instructor’s discretion to approve or disapprove of the alternative excuse.

Students are responsible for all material covered in classes they miss, even when their absences are excused as defined above. In turn, instructors are not to penalize students with excused absences.

♦ Policies on Late Work

It is up to the instructor as to the acceptance of assignments not completed by the deadline and each case will be evaluated individually.

♦ Drop / Withdrawal

The petition for withdrawal must be received in the Office of the Registrar, Rocket Hall, Room 1100, by the deadline date either: in person, fax, or mail. When mailing, the envelope must be postmarked by the deadline date. For the fall and spring terms, it must be filed between the 15th calendar day of the term through Friday of calendar week 10.
**Academic Dishonesty**

Academic dishonesty will not be tolerated. Among the aims of education are the acquisition of knowledge and development of the skills necessary for success in any profession. Activities inconsistent with these aims will not be permitted. Students are responsible for knowing what constitutes academic dishonesty. If students are uncertain about what constitutes plagiarism or cheating they should seek the instructor's advice. Examples of academic dishonesty include, but are not limited to:

- Plagiarizing or representing the words, ideas or information of another person as one's own and not offering proper documentation;
- Giving or receiving, prior to an examination, any unauthorized information concerning the content of that examination;
- Referring to or displaying any unauthorized materials inside or outside of the examination room during the course of an examination;
- Communicating during an examination in any manner with any unauthorized person concerning the examination or any part of it;
- Giving or receiving substantive aid during the course of an examination;
- Commencing an examination before the stipulated time or continuing to work on an examination after the announced conclusion of the examination period;
- Taking, converting, concealing, defacing, damaging or destroying any property related to the preparation or completion of assignments, research or examination;
- Submitting the same written work to fulfill the requirements for more than one course.

While academic integrity is particularly the responsibility of the student, the faculty members also have a responsibility. Assignments and tests should be constructed and proctored so as to discourage academic dishonesty. Faculty members are expected to inform their students explicitly as to what materials and procedures are authorized for use in the preparation of assignments or in examinations (e.g., the use of calculator, computer, text materials, etc.).

**Should cases of academic dishonesty be found** among students, the instructor may choose to counsel the student, or the following sanctions may be imposed:

- The student may be assigned an F for the work in question.
- The student may be assigned an F for the course. In this case the instructor should inform the Dean and the student of this action. The Dean will make certain that the student receives the F grade and is not permitted to withdraw from the course.
- The student may be placed on probation or suspended for some definite period of time, dismissed or expelled by the Dean if either the seriousness of the offense or a record of repeated offenses warrants it. A notation that such a sanction has been imposed will be made part of the student's permanent record. It is expected that the Dean will consult with the instructor and the student in making such a judgment, and that the Dean will notify the student of the sanction imposed and of the appeals procedure.
A student found to be academically dishonest by a faculty member may appeal according to procedures approved by the respective colleges. The procedures for making a final appeal to the Student Grievance Committee may be found in the Student Handbook.

♦ Classroom Courtesy

- The University has jurisdiction over any individual student, group of students or student organization alleged to have violated the Student Code of Conduct on the University of Toledo premises.
- Students must conduct themselves in a manner which is conducive to learning for themselves and others. Disruptive behaviors are not acceptable and may affect a student's final grade, or in severe cases result in a student being removed from class.
- Disruption of operations of the University Community. Disruption is an action or combination of actions by an individual or a group, which unreasonably interferes with, hinders, obstructs, or prevents the right of others to freely participate in its programs, services, or academic settings. This may include, but is not limited to a disruption by the use of pagers, cell phones and/or any other communication devices.
- The use of cell phones, pagers, iPods, MP3 players and such will not be permitted in the classroom. No pets are to be brought to the classroom.
- Students may audiotape lectures; however, no video recording or electronic transmission of lecture proceeding or precipitants is permitted.
- For issues pertaining to lecture content, contact the lecturer of the topic. For issues pertaining to grades, tests, lecture schedule, reading assignments, etc., contact either the instructor for the material or the course coordinators.

♦ Examination Regulations

- Promptness - Students should be in the assigned examination room at the start of the class period. No extra time will be permitted for students who arrive late for an examination.
- Articles in Examination Room - Articles such as coats, hats, purses, notebooks, papers, books, telephones, electronic devices, etc. are NOT PERMITTED INSIDE THE EXAMINATION HALL. Secure these items outside the examination hall. If you bring these items to the examination hall you will be asked to first secure the disallowed items before taking the exam. Pagers, telephones, PDAs, or other electronic equipment is not permitted to be used in any capacity during an examination and should be turned off.
- Calculators can be used on examinations. The calculator must be approved for use in the course. Programmable calculators are not allowed to be used during examinations and quizzes. Calculators that do not comply with these requirements will be confiscated. No arrangements will be made to provide additional calculators.
- Violation of the Student Academic Code - Violation of the student academic code WILL NOT BE TOLERATED on any examination. Individuals accused of a violation will be prosecuted according to the policies and procedures of the College and University.
- Seating - Course Coordinators & Instructors reserve the right to seat individuals as they see necessary during lectures and examinations
- Asking Questions - Technical questions (misspellings, missing a page, wrong numbering or lettering, etc.) will be readily answered during examinations. Any questions arising regarding interpretation of an exam question are encouraged to be written out on the test and be brought to the attention of the instructor when handing in the test.
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• The use of dictionaries of any sort during examinations is prohibited.
• Consumption of food or beverages, the use or expectoration of chewing tobacco, smoking, or listening/viewing to audio/video equipment, is not permitted during examinations.
• Conversing with anyone other than instructors is not permitted once answer sheets and/or tests are being passed out. One may resume conversation once they have left the testing room. When speaking outside the classroom following an exam, voices should be at a level that will not disrupt those remaining who are still taking the exam.
• Items in one’s possession during an examination are subject to inspection.
• Students are responsible for assuring answer sheets to examinations are marked properly.
• Students shall treat their answer sheets and test booklets in a manner that does not allow or tempt other students to look at them.
• Students who request the use of the lavatory during an exam are subject to a 5 point deduction of their examination score.
• If a class period, during which an exam or quiz was to be given, is canceled or interrupted, assume the exam or quiz will be given during the next scheduled class period if it is not completed on the assigned day.
• Grades can only be passed out directly to the student or mailed (via U.S. mail) directly to the student. Grades cannot be given over the phone, to a friend, or via email.

◆ MAKEUP EXAMINATIONS & QUIZZES

• Unexcused absences resulting in a missed exam will result in a grade of zero.
• Makeup exams will only be administered for excused absences. Prior approval for an absence from an examination can only be obtained from acknowledged direct contact with the course coordinator. Post-exam approval for an excused absence from an examination must be sought out immediately upon the student’s arrival back to school. Documentation of why the absence occurred will be required.
• Makeup examinations will be given as determined by the instructor.
• Exceptions may be rarely possible with emergencies upon the discretion of the Course Coordinator.

The anticipated scale for evaluation of student competency is as follows:

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-100%</td>
<td>A</td>
</tr>
<tr>
<td>80-89%</td>
<td>B</td>
</tr>
<tr>
<td>70-79%</td>
<td>C</td>
</tr>
<tr>
<td>65-69%</td>
<td>D</td>
</tr>
<tr>
<td>&lt; 65%</td>
<td>F</td>
</tr>
</tbody>
</table>

Weighting for each component towards the final grade calculation is based on approximate contribution of each module to the total course content. Weighting does NOT imply content importance.
FINAL GRADE CALCULATION:

One midterm exam lasting one class period will be given. The final exam will be comprehensive. Cumulative grades will be based on the following weights.
- 15% midterm exam-I
- 15% midterm exam-II
- 15% midterm exam-III
- 15% presentation
- 40% final exam

Blackboard Information

All course announcements and lecture-related materials are posted and available on the course website through blackboard. It is the student's responsibility to frequently access the course website for the latest information, assignments and materials.
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- 40% final exam

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Course content

1. The origins and evolution of “controlled” drug delivery systems
2. Rationale and applications of the Produg-approach
3. Biodegradable polymeric nanoparticles as drug delivery devices
4. Polymeric micelles as new drug carriers
5. Solid lipid nanoparticles: Production, characterization and applications
6. Liposomes: An overview of manufacturing techniques
7. Osmotically controlled drug delivery system with associated drugs
8. Role of various efflux and influx transporters in drug delivery
9. Oral drug delivery systems comprising altered geometric configurations for controlled drug delivery