

The University Of Toledo

New Graduate Course Proposal

* denotes required fields

1. College*:
- Department*:
2. Contact Person*: Phone: (xxx - xxxx) Email:
3. Alpha/Numeric Code (Subject area - number)*: -
4. Proposed title*:
Proposed effective term*: (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: or Variable:
- to
7. Delivery Mode:
- | | Primary* | Secondary | Tertiary |
|---------------------------|--------------------------------------|---------------------------------------------|---------------------------------------------|
| a. Activity Type * | <input type="text" value="Lecture"/> | <input type="text" value="--SelectType--"/> | <input type="text" value="--SelectType--"/> |
| b. Minimum Credit Hours * | <input type="text" value="2"/> | <input type="text"/> | <input type="text"/> |
| Maximum Credit Hours * | <input type="text" value="2"/> | <input type="text"/> | <input type="text"/> |
| c. Weekly Contact Hours * | <input type="text" value="2"/> | <input type="text"/> | <input type="text"/> |
8. Terms offered: Fall Spring Summer
- Years offered: Every Alternate

Year 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

10. Grading System*:
- Normal Grading (A-F, S/U, WP/WF, PR, I)
 - Satisfactory/Unsatisfactory (A-C, less than C)
 - Grade Only (A-F, WP/WF, 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**)

This course is designed to provide students with an understanding of the current state of the art for novel drug delivery systems with a particular focus on nanocarrier systems such as nanoparticles, polymeric micelles and solid lipid nanoparticles, for delivering small molecules. This course will introduce students to recent topics in the areas of cancer therapy and site-specific drug delivery.

13. Attach a syllabus - a syllabus template is available from the University Teaching Center. Click [here](#) for the Center's template.

File Type	View File
Syllabus	View

14. Comments/Notes:

15. Rationale:

We are adding this new advanced drug delivery systems course to better prepare our graduate students as they move on to PhD programs or to pursue a career in the pharmaceutical industry.

Course Approval:

Department Curriculum Authority:	Mariann D Churchwell	Date	2017/03/15
Department Chairperson:	Diane Cappelletty	Date	2017/03/15
College Curriculum Authority or Chair:	Frederick E. Williams	Date	2017/03/20
College Dean:	Laurie S. Mauro	Date	2017/03/20
Graduate Council:	Constance Schall, GC mtg 4/18/17	Date	2017/04/19
Dean of Graduate Studies:	Amanda C. Bryant-Friedrich	Date	2017/05/01
Office of the Provost :		Date	

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Administrative Use Only

Effective Date:  (YYYY/MM/DD)

CIP Code:

Subsidy Taxonomy:

Program Code:

Instructional Level:

Registrar's Office Use Only

Processed in Banner on: 

Processed in Banner by:

Banner Subject Code:

Banner Course Number:

Banner Term Code:

Banner Course Title:



PHPR 5780: Advanced Drug Delivery Systems-2

The University of Toledo
College of Pharmacy and Pharmaceutical Sciences
CRN: XXXXX

Instructor:	Dr. Sai HS. Boddu	Term:	Fall 2017
Email:	sboddu@utnet.utoledo.edu	Class Location:	TBD
Office Hours:	TBD	Class Day/Time:	TBD
Office Location:	HEB 114G	Credit Hours:	2
Office Phone:	419-383-1959		

ADDITIONAL COURSE INSTRUCTORS:

Course Instructor(s):

DR. JERRY NESAMONY

Faculty Office: HEB114J

Office Hours: *email for an appointment*

Phone: 419-383-1938

E-Mail: Jerry.Nesamony@utoledo.edu

DR. GABRIELLA BAKI

Faculty Office: HEB114F

Office Hours: *email for appointment*

Phone: 419-383-1973

E-Mail: Gabriella.Baki@utoledo.edu

DR. AMIT TIWARI

Faculty Office: HEB282F

Office Hours: *email for appointment*

Phone: 419-383-1913

E-Mail: Amit.Tiwari@UToledo.edu

COURSE/CATALOG DESCRIPTION

This course is designed to provide students with an understanding of the current state of the art for novel drug delivery systems with a particular focus on nanocarrier systems such as nanoparticles, polymeric micelles and solid lipid nanoparticles, for delivering small molecules. This course will introduce students to recent topics in the areas of cancer therapy and site-specific drug delivery. The course will also cover latest developments in pediatric dosages forms such as orally disintegrating tablets. The class format will be lectures followed by critique of recent literature.



STUDENT LEARNING OUTCOMES

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

- Demonstrate the importance of nanotherapeutics in drug delivery.
- Describe challenges in chemotherapy and understand advantages of combination chemotherapy in cancer.
- Differentiate various nanocarrier systems such as polymeric micelles, polymeric nanoparticles and solid lipid nanoparticles for enhancing drug bioavailability.
- Describe the advanced concepts in pediatric dosage design such as orally disintegrating tablets

PREREQUISITES AND COREQUISITES

Prerequisite: PHPR 3020 and PHPR 3030

REQUIRED TEXTS AND ANCILLARY MATERIALS

1. Handouts and material posted on Blackboard.
2. Uchegbu, Ijeoma F., and Andreas G. Schatzlein, eds. Polymers in drug delivery. CRC Press, 2006.
3. Lachmann, L., Lieberman, H.A. & Kanig, J.I.: The Theory and Practice of Industrial pharmacy. Lea and Fibiger, Philadelphia.
4. Banker, G.S. & Rhodes, C.T. : Modern Pharmaceutics, Marcel Dekker Inc. New York and Basel.
5. Bean, H.S., Backett, A.H. & Carless, J.E: Advances in Pharmaceutical Sciences, Academic Press, London and Newyork.
6. Jain, N.K.: Controlled and Novel Drug Delivery , CBS, Delhi
7. Robinson, J.R. & Lee, V.H.L.: Controlled Drug Delivery, Marcel Dekker, New York and Basel.
8. Chien,Y.W.: Novel Drug Delivery Systems, Marcel Dekker,New York and Basel
9. Jain N. K. Pharmaceutical Product Development, CBS Publisher, Delhi

REQUIRED EQUIPMENT

Calculator (Required: TI30X-IIS Calculator), Laptop, Flash drive, Students should be familiar with Blackboard software

UNIVERSITY POLICIES

Policy Statement on Non-Discrimination on the basis of Disability (ADA)

The University is an equal opportunity educational institution. Please read [The University's Policy Statement on Nondiscrimination on the Basis of Disability Americans with Disability Act Compliance](#).

Academic Accommodations



The University of Toledo is committed to providing equal access to education for all students. If you have a documented disability or you believe you have a disability and would like information regarding academic accommodations/adjustments in this course please contact the [Student Disability Services Office](#).

ACADEMIC POLICIES

CLASSROOM POLICIES & PROCEDURES

Classroom Policies

1. Classes are scheduled to start promptly as per the schedule.
2. Cell phones and pagers are to be turned off (or in vibration mode) during lecture.
3. No pets or children are to be brought to the classroom.
4. If a student is absent from a lecture day, it is his/her responsibility to obtain the material discussed in class on that day as well as obtaining any handouts, information, or announcements presented to the class that day.
5. Students are expected to conduct themselves in a mature and professional manner

- 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.
 - 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.
 - 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.



- Excused Absences: The student is responsible for informing Dr. Boddu in advance by e-mail, voice mail, if the student intends to miss an exam. Using more than 1 method of notification is advised. Failure to inform the instructor in a reasonable time frame regarding the need to miss an examination will result in a failing grade for that examination.

GRADING

**** The grading policy is subject to change at the discretion of the course coordinator****

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

93-100%	A
92-90%	A-
87-89%	B+
83-86%	B
80-82%	B-
77-79%	C+
73-76%	C
70-72%	C-
65-69%	D
< 65%	F

Weighting for each component towards the final grade calculation is based on the 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 grade will be based on the following weights.

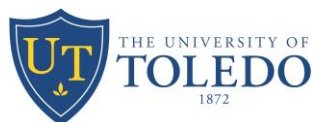
30% Midterm -I

30% Midterm -II

40% Final exam

COMMUNICATION GUIDELINES

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.



COURSE SCHEDULE

PHPR5780: Advanced Drug Delivery Systems-2	
Week	Class Session (instructor)
1	Introduction/Nanotechnology in Therapeutics (Dr. Boddu)
2	Drug resistance in cancer (Dr. Tiwari)
3	Drug resistance in cancer/Research paper (Dr. Tiwari)
4	Combination chemotherapy (Dr. Tiwari)
5	Combination chemotherapy/Research paper (Dr. Tiwari)
6	Midterm-I
7	Polymeric Nanoparticles as Drug Carriers (Dr. Boddu)
8	Polymeric Nanoparticles as Drug Carriers/Research article (Dr. Boddu)
9	Polymeric Micelles as Pharmaceutical Carriers (Dr. Boddu)
10	Polymeric Micelles as Pharmaceutical Carriers/Research article (Dr. Boddu)
11	Midterm-II
12	Solid lipid nanoparticles/Research paper (Dr. Nesamony)
13	Prodrug approach
14	Osmotic drug delivery/Research paper (Dr. Baki)
15	Final exam