

PROCESS A NON-GENERAL EDUCATION ~ CURRICULUM PROPOSAL

SCC #02-03- 812

Lines:

Regular proposals: October 18, 2002 to be implemented Fall 2003; Short-Term proposals: December 6, 2002 to be implemented Fall 2003
Regular proposals: February 14, 2003 to be implemented Spring 2004; March 21, 2003 short-term courses to be implemented Spring 2004

PROPOSAL TITLE: Medicinal Chemistry

Sponsor(s): Cathy Yang E-Mail: yang@rowan.edu Ext: 3569
Robert Newland E-Mail: newland@ Ext: 4853

DEPARTMENT: Chemistry & Physics

COLLEGE: Liberal Arts & Science

If Liberal Arts & Sciences CHECK : History/Humanities Math/Sciences Social/Behavioral Sciences

UNDERGRADUATE GRADUATE

THE ATTACHED **NON-GEN-ED** PROPOSAL IS BEST DESCRIBED BY THE ITEM(S) CHECKED.

RECEIVED BY

New non-gen-ed course Non-gen-ed degree requirements

Short-term non-gen-ed course Major

Minor curricular changes (fewer than three) Minor, specialization, concentration, track, certificate program

Existing non-gen-ed course LIBERAL ARTS & SCIENCES

The following signatures REPRESENT APPROVAL

Department Chair: Edward V. Flynn Date: 2/12/03

Department Curriculum Chair: W. R. ... Date: 2/12/03

Academic Dean: Jay ... Date: 2/14/03

College Curriculum Chair: R. M. ... Date: 3/27/03

College Curriculum Committee OPEN HEARING Date: Approved Not Approved

UNIVERSITY CURRICULUM COMMITTEE

Senate Curriculum Chair Signature: Philip J. ... Date: Senate Announcement/Vote: 11-10-2003

Comments: Is a combined proposal for a graduate and undergraduate course.

EXECUTIVE VICE PRESIDENT/PROVOST Signature: Helen ... Date: 1/27/04

Approved ~ Not Approved due to the following: Student Cr Hrs Faculty Load Hrs Equalized Cr Hrs

as an undergraduate course only *Also approved for graduate 12/05

REGISTRAR [Signature] Course Description Received & Approved ~ Hegis Taxonomy & Course #: 1907410

Registrar Signature: [Signature] 1/25/05 1907510

NOTIFICATION FORWARD

SCC Chair Academic Dean Department Chair Registrar Sponsor(s)

IR & CAP rev TM 2/16/04

Medicinal Chemistry

1. Course Title:	Medicinal Chemistry
Sponsor:	Cathy F. Yang, Department of Chemistry and Physics
Credit Hours:	3 s.h.
Course Level:	Junior and senior
Curricular Effect:	Restricted Elective
Prerequisites:	Organic Chemistry II (1907.201)
Time of Implementation:	Fall, 2004
Adequacy of Resources:	Present faculty, facilities and library holdings will be adequate by the time of implementation.

2. Rationale:

Scientific understanding of the molecular nature of life is growing at an astounding rate. Naturally, society is the prime beneficiary of this increased understanding. Cures for diseases, better public health, remediations for environmental pollution, and the development of more specific and safer natural products are just a few practical results of this knowledge.

This course is proposed as an upper graduate level Biochemistry course added to the Biochemistry. It is a standard required course across the Country in many institutions that offer a B.S. in Biochemistry. It was offered a few years ago as a special topic course at Rowan which attracted many students from different programs. Chemistry, Biology and Chemical Engineering majors may also select this course as an elective. Medicinal chemistry involves the interface between chemistry and biology combined with biotechnology. This course is therefore highly interdisciplinary which can provide strong preparation for students who will choose biochemical and biomedical careers.

3. Essence of the Course:

a. Objectives:

At the end of this course, students will:

1. gain an overview of the biochemical principles and metabolic pathways in living systems.
2. learn to describe metabolism with special emphasis on how the pathways are organized and more importantly how they are regulated.

3. understand the concepts of drug discovery, drug design, and relationships of chemical structure to drug action.
4. learn the biochemical rationales of drug actions on specific targets such as receptors, enzymes, and other macromolecules.
5. learn the principles underlying rational therapeutics.
6. be required to conduct an in-depth review of the literature regarding a topic within the areas described above.

b. Topical Outline :

I. Introduction and Background

(What is Medicinal Chemistry-A Historical Perspective_)

II. Protein Structure

(Three-dimensional structures, folding and dynamics)

III. Drug action at enzymes

(Enzymes, kinetics and medicinal uses of enzyme inhibitors)

IV. Metabolism and Its Regulation

(Metabolic integration and the unidirectionality of pathways)

V. Drug action at receptors

(The receptor role, neurotransmitters, design of agonists and antagonists)

VI. Nucleic acids

(Structure of DNA, drugs acting on DNA and drugs acting on RNA)

VII. Drug development

(Screening of natural products, synthetic analogues, combinatorial chemistry and molecular modeling)

VIII. Pharmacodynamics

(Drug distribution, pharmacokinetic aspects and clinical case study)

IX. Antibacterial and antitumor agents

(Mechanisms of antibacterial and antitumor actions, drug resistance and improvement)

X. Rational approach to drug design

(Human genome, bioinformatics and computer modeling)

c. Evaluation Procedures:

Students will be evaluated by class participation, exams, oral presentation of a research paper, and tests. The research paper will be on a topic relevant to the course selected by the student and approved by the instructor.

d. Course Evaluations:

The departmental course evaluation form will be used at the end of the course.

4. Consultations:

1. Full support from Chemistry Faculty
2. A support letter from Dr. Patricia Mosto, Chair of Biological Sciences in behalf of Biology Faculty
3. A support letter from Dr. Stephanie Farrell, Chemical Engineering

5. Possible Course Texts

1. Patrick, G. L. (1997), An Introduction to Medicinal Chemistry, Oxford University Press.
2. Waterbeemd, H., Testa, B. and Folkers, G. (1997) Computer-assisted lead finding and optimization : current tools for medicinal chemistry.
3. Ojima, I., Vite, G. D. and Altmann, K-H. (2001), Anticancer agents: frontiers in cancer chemotherapy.
4. Based on the nature of this emerging field, current journal papers will be heavily used.

Catalog Description:**Medicinal Chemistry** (1907.4 x x)

3 s.h.

(Prerequisite: 1907.201)

A study of the biochemical principles and metabolic pathways with particular emphasis on pharmaceutical applications and biotechnology. This course will focus on the molecular mechanisms of drug action and chemical basis for drug therapy. Current methods used to study medicinal chemistry including recombinant DNA, combinatorial chemistry and bioinformatics, will be reviewed. A 3-D molecular modeling of drug targets and drug design will be integrated throughout the course. Clinical trials of drug case study are included.

Medicinal Chemistry

1. Course Title:	Medicinal Chemistry
Sponsor:	Cathy F. Yang, Department of Chemistry and Physics
Credit Hours:	3 s.h.
Course Level:	Graduate
Curricular Effect:	Non
Prerequisites:	Organic Chemistry II (1907.201)
Time of Implementation:	Fall, 2004
Adequacy of Resources:	Present faculty, facilities and library holdings will be adequate by the time of implementation.

2. Rationale:

Scientific understanding of the molecular nature of life is growing at an astounding rate. Naturally, society is the prime beneficiary of this increased understanding. Cures for diseases, better public health, remediations for environmental pollution, and the development of more specific and safer natural products are just a few practical results of this knowledge.

This course is also proposed as a graduate level Biochemistry course. It is a standard required course across the Country in many institutions that offer graduate programs in Chemistry, Biochemistry and Pharmacology. It was offered a few years ago as a special topic course at Rowan which attracted many students from different programs, particularly some working at biotech and pharmaceutical companies in this tri-state area. Chemistry, Biology and Chemical Engineering majors may also select this course as an elective. Medicinal chemistry involves the interface between chemistry and biology combined with biotechnology. This course is therefore highly interdisciplinary which can provide strong preparation for students who will choose biochemical and biomedical careers.

3. Essence of the Course:

a. Objectives:

At the end of this course, students will:

1. gain an in depth understanding of the biochemical principles and metabolic pathways in living systems.
2. learn to describe metabolism with special emphasis on how the pathways are organized and more importantly how they are regulated.

3. understand the concepts of drug discovery, drug design, and relationships of chemical structure to drug action.
4. learn the biochemical rationales of drug actions on specific targets such as receptors, enzymes, and other macromolecules.
5. learn the principles underlying rational therapeutics.
6. be required to conduct an in-depth review of the literature regarding a topic within the areas described above.
7. turn in a term paper on a project of comprehensive drug design.

b. Topical Outline :

I. Introduction and Background

(What is Medicinal Chemistry-A Historical Perspective_)

II. Protein Structure

(Three-dimensional structures, folding and dynamics)

III. Drug action at enzymes

(Enzymes, kinetics and medicinal uses of enzyme inhibitors)

IV. Metabolism and Its Regulation

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(The receptor role, neurotransmitters, design of agonists and antagonists)

VI. Nucleic acids

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VII. Drug development

(Screening of natural products, synthetic analogues, combinatorial chemistry and molecular modeling)

VIII. Pharmacodynamics

(Drug distribution, pharmacokinetic aspects and clinical case study)

IX. Antibacterial and antitumor agents

(Mechanisms of antibacterial and antitumor actions, drug resistance and improvement)

X. Rational approach to drug design

(Human genome, bioinformatics and computer modeling)

c. Evaluation Procedures:

Students will be evaluated by class participation, exams, oral presentation of a research paper, and tests. The research paper will be on a topic relevant to the course selected by the student and approved by the instructor.

d. Course Evaluations:

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3. Ojima, I., Vite, G. D. and Altmann, K-H. (2001), Anticancer agents: frontiers in cancer chemotherapy.
4. Based on the nature of this emerging field, current journal papers will be heavily used.

Graduate Catalog Description:

Medicinal Chemistry (1907.5 x x)

3 s.h.

(Prerequisite: 1907.201)

This course describes various topics related to the biochemical principles and metabolic pathways with particular emphasis on pharmaceutical applications and biotechnology. This course will focus on the molecular mechanisms of drug action and chemical basis for drug therapy. Current methods used to study medicinal chemistry including recombinant DNA, combinatorial chemistry and bioinformatics, will be reviewed. A 3-D molecular modeling of drug targets and drug design will be integrated throughout the course. Clinical trials of drug case study are included.

A term project is incorporated into this course. Students are required to conduct an in-depth review of the literature regarding a topic.

Subject: Course Proposal

Date: Wednesday, February 5, 2003 1:45 PM

From: Farrell, Stephanie <Farrell@rowan.edu>

To: Catherine Yang <yang@rowan.edu>

Dear Cathy:

I have reviewed your course proposal for Medicinal Chemistry, and I strongly endorse this proposal. The course content is unique, and will strongly enhance the Biochemistry program of study. In addition, the course would be an interesting elective for Chemical Engineering students planning careers in the pharmaceutical industry. The course will qualify as an advanced chemistry course as required under the ABET accreditation guidelines.

Thank you for proposing this exciting new course. Please do not hesitate to contact me if I can be of any assistance.

Sincerely,

Stephanie Farrell

Department of Chemical Engineering
Rowan University
201 Mullica Hill Rd
Glassboro, NJ 08028-1701

Tel: 856.256.5315

Fax: 856.256.5242

farrell@rowan.edu

<http://engineering.rowan.edu/~farrell>



Biological Sciences

February 10, 2003

Dr. Catherine Yang
Department of Chemistry
Rowan University

Dear Cathy:

Members of my department and I have reviewed your course proposal for Medicinal Chemistry, and we endorse this proposal. The course content is unique, and we feel is a needed component for the Biochemistry. In addition, the course would be an interesting elective for Biology students planning careers in the medical or pharmaceutical professions.

Please do not hesitate to contact me if I can be of further assistance.

Sincerely,

Dr. Patricia Mosto
Chair and Professor
Biology Department
Rowan University
856-256-4834
mosto@rowan.edu



Department of Chemical Engineering

February 7, 2003

Dr. Catherine Yang
Department of Chemistry and Physics
Rowan University
201 Mullica Hill Rd.
Glassboro, NJ 08028

Dear Cathy:

I have reviewed your course proposal for Medicinal Chemistry, and I strongly endorse this proposal. The course content is unique, and will strongly enhance the Biochemistry program of study. In addition, the course would be an interesting elective for Chemical Engineering students planning careers in the pharmaceutical industry. The course will qualify as an advanced chemistry course as required under the ABET accreditation guidelines.

Thank you for proposing this exciting new course. Please do not hesitate to contact me if I can be of any assistance.

Sincerely,

Stephanie Farrell
Associate Professor



Biological Sciences

February 10, 2003

Dr. Catherine Yang
Department of Chemistry
Rowan University

Dear Cathy:

Members of my department and I have reviewed your course proposal for Medicinal Chemistry, and we endorse this proposal. The course content is unique, and we feel is a needed component for the Biochemistry. In addition, the course would be an interesting elective for Biology students planning careers in the medical or pharmaceutical professions.

Please do not hesitate to contact me if I can be of further assistance.

Sincerely,

Dr. Patricia Mosto
Chair and Professor
Biology Department
Rowan University
856-256-4834
mosto@rowan.edu

Rowan University
LIBRARY RESOURCES

to
SUPPORT A NEW COURSE or NEW PROGRAM PROPOSAL

The purpose of this form is to provide a channel of communication between the library and faculty designing new courses/programs. The information will be used to assess the resources available in the library, and to identify resources the library should acquire to support the course/program. The information will also provide rationale for institutional support for library acquisitions

This form should be completed in a coordinated effort between the course sponsor(s) and the academic department liaison librarian.

- The sponsor(s) complete parts A & D
 If assistance is required to complete parts A & D, please notify the liaison librarian.
- Forward this form to the librarian who will complete parts B, C, & E

This form must be completed and attached to the original curriculum proposal before being approved by the Senate Curriculum Committee

A. College L&S Department Chemistry & Biochemistry
 Proposed by: Dr. C. Yang Date: 3/26/03
 Course Title: Medicinal Chemistry
 Anticipated Date for Course/Program Offering: Fall. 04

B. Describe the resources available in the library to support this course/program, including reference, monographic, electronic databases, audio-visual materials, etc. A summary statement is sufficient.

See attached form!

C. List key periodicals available in the library to support this course/program.

D. List specific resources that should be acquired to support this course.

E. Librarian comments and recommendations:

Rowan University
LIBRARY RESOURCES
To
SUPPORT A NEW COURSE or NEW PROGRAM PROPOSAL

College: College of Liberal Arts Dept.: Chemistry & Biochemistry

Proposed by: Dr. Cathy Yang Date: March 31, 2003

Course Title: Medicinal Chemistry

Anticipated Date for Course/Program Offering: Fall 2004

Part B: Resources available in Campbell Library

Campbell Library has acquired key book resources in Pharmaceutical Chemistry, the specific Library of Congress subject category for this proposal. In addition, the library has approximately 300 titles in the fields of chemistry, biochemistry, medicine, pharmacology, and drugs.

Part C: List key periodical resources

Campbell Library is fortunate to have extensive access to online serials databases in a large number of disciplines, including the major Elsevier SciDirect database. Elsevier provides access to over 1,300 full-text journals in the sciences, including 110 titles specifically in biochemistry, pharmacology, drugs, and medicine. In addition, the library also subscribes to the CINAHL database, which provides abstracts of articles in the fields of pharmacology and medicine. The Medline database is also available.

The Library subscribes to 78 print journals in chemistry, biology, and physics. For periodicals not available in the library or through our online database services, an interlibrary loan and document service is available for faculty and students.

Part D: List resources that should be acquired

The library reviewed its holdings with the sponsoring professor. At this point, no additional resources need to be purchased to support the course in Medicinal Chemistry.

Part E: Librarian remarks

Based on the strength of our online database services and the adequacy of our print holdings, the library supports this proposal.

Subject: Proposal

Date: Thursday, March 27, 2003 12:36 PM

From: Eric Milou <milou@rowan.edu>

To: Catherine Yang <Yang@rowan.edu>

Cathy,

Your course proposal passed contingent upon you making the following changes:

- (1) fix catalog description
- (2) complete a library form
- (3) How often will the course be offered?
- (4) Change graduate to undergraduate

Please make the changes above and resubmit to Senate office.

Thanks,
Eric Milou

**Thursday, April 22, 2004
11:15 am**

**Meeting with Dr. Catherine Yang
Department of Chemistry and Physics**

**Re: A Course Entitled "Medicinal
Chemistry**

Bonny Melendrez
Roe - *to*
This will be
modified - moved to
graduate - not
undergraduate
RECEIVED
25 2004
ACADEMIC AFFAIRS
FROM: *lye*

From: Helen Giles-Gee
To: "yang@rowan.edu".GWIA.ROWANDOM
Date: 3/30/04 12:33PM
Subject: Re: FW: Medicinal Chemistry

Dear Cathy,

Due to the illness of my mother, my appointments on campus have been backed up. I will ask Marty to schedule your appointment as soon as she is able.

Thanks for your patience.

Helen

>>> Catherine Yang <yang@rowan.edu> 03/22/04 02:05PM >>>

Dear Helen,

I would like to schedule an appointment with you discussing an issue on a course called "Medicinal Chemistry". The nature of this course is really a graduate level course. We pushed it into our Biochemistry undergraduate curriculum to bring up the level of the new program. I appreciate an opportunity to share my thought with you on this curricular issue.

In addition, I appreciate your time at the "Scholar Night" listening my ongoing research projects.

Best regards!

_Cathy

Cathy F. Yang, Ph.D.
 Professor
 Coordinator, Biochemistry Program
 Department of Chemistry and Biochemistry
 Rowan University
 Glassboro, NJ 08028
 (856) 256-5455(O)

----- Forwarded Message

From: "Faison, Christy" <Faison@rowan.edu>
 Date: Mon, 15 Mar 2004 14:10:26 -0500
 To: "Catherine Yang" <yang@rowan.edu>
 Subject: RE: Medicinal Chemistry

Cathy,

I would suggest talking to the Provost (or perhaps Phil Lewis) about why the graduate component was not approved. Helen usually provides Phil with a list of problems regarding curriculum proposals, so he may have the specifics. If not, you'll have to talk to Helen and address her concerns. Let me know if you need additional information. Christy

Christy L. Faison, Ed.D.
 Associate Provost for Academic Affairs
 Rowan University
 856-256-4012

-----Original Message-----

This could have been resolved if I had been informed to schedule an appointment

*Phil 22 10:15
 796 3 30*

From: Catherine Yang [mailto:yang@rowan.edu]
Sent: Monday, March 15, 2004 10:47 AM
To: Faison, Christy
Subject: Re: Medicinal Chemistry

Christy,

Thank you for such prompt answer. We submitted the graduate proposal along with the undergraduate one. The Medicinal Chemistry is a senior/graduate course. There are some people from pharmaceutical industry interested in taking this course as graduate course. Our biochemistry majors require this course for graduation. However, it may not have enough people to run this fall it doesn't include graduates. I need your advice for solving this problem. Thanks!

Cathy

On 3/15/04 10:27 AM, "Faison, Christy" <Faison@rowan.edu> wrote:

> Hi Cathy,
>
> According to the Provost's Office, this course was approved January 20, 2004
> (UNDERGRADUATE ONLY). It was announced on the 2/16/04 transmittal of
> curriculum approvals from the Provost. If you have other questions,
> please
> feel free to contact me. Christy
>
> Christy L. Faison, Ed.D.
> Associate Provost for Academic Affairs
> Rowan University
> 856-256-4012
>
>
> -----Original Message-----
> From: Catherine Yang [mailto:yang@rowan.edu]
> Sent: Monday, March 15, 2004 10:16 AM
> To: Faison, Christy
> Subject: Re: Medicinal Chemistry
>
>
> Dear Christy,
> I would like to find out the status of "Medicinal Chemistry" course
> proposal. Phillip told me the proposal was forwarded to your Office near
> the
> end of last semester. We plan to offer this course next semester as the
> requirement course for Biochemistry majors. I appreciate your time or
> forward it to the right person. Thanks!
>
> Cathy
>
> Cathy F. Yang, Ph.D.
> Professor
> Coordinator, Biochemistry Program
> Department of Chemistry and Biochemistry
> Rowan University

> Glassboro, NJ 08028
> (856) 256-5455(O)
>

----- End of Forwarded Message

CC: Cucinotta, Marty

Rec - put this w/ the proposal

Faison, Christy

From: Catherine Yang [yang@rowan.edu]
ent: Friday, September 17, 2004 2:06 AM
o: Faison, Christy
Cc: Newland, Robert
Subject: RE: Medicinal Chemistry

SCCF
02-03-8/2

Dear Dr. Faison,

I discussed the curricular issue with Phil after meeting with Dr. Giles-Gee's. Phil promised that he would remediate the issue immediately at a University curriculum meeting before the end of the semester. Today, I just left a message to Phil. I would like to discuss with you on the resolution once I hear from Phil.

I understand the logic of Dr. Giles-Gee to design the stand alone courses for undergraduates and graduates in order to maintain standards. However, here at sciences departments, we do offer some senior/graduate courses for supporting Teaching degrees plus some professional needs. We can not separate those graduate courses from undergraduates due to the low enrollment of graduates. Practically, we often add additional requirements to graduate students such as term paper. The new courses in this category are now designed to be more towards graduate level since many science senior students from other universities are commonly recommended to take a few graduate courses. Here enclose the mail written by Dr. Giles-Gee. I look forward to the opportunity to discuss the issue with you in general.

Cathy

Cathy,

am forwarding this to you because I noted you were not copied.

Jay

-----Original Message-----

From: Giles-Gee, Helen
Sent: Thursday, April 22, 2004 4:45 PM
Cc: Harper, Jay A.; Faison, Christy; Feng-Jen, Yang; Vitto, Cindy L.
Subject: Medicinal Chemistry

Phil,
I had a long talk with Dr. Cathy yang today about the course, Medicinal Chemistry, which had been recommended as both an undergraduate and graduate offering but approved for undergraduates only. It appears that questions I had raised were caught between the movement of the single department into two. Nevertheless, Dr. Yang and I are in agreement that this course should exist as a graduate and not an undergraduate course. Its substance validates this assignment.

I have asked her to talk with you about the best way to expedite the change through curricular procedures. Call if you have any questions Helen

Curriculum Proposal Mathematics

FYI INFO	DEPT	Transmittal	New Course	G			General Educ	COURSE TITLE	SCC #	HEGIS #	m	D	Y
				R	A	D							
*	Chemistry/Physics	TM 2/16/04		U				Medicinal Chemistry Only the undergraduate course was approved. *note from Provost 4/26/04 - "proposal will be modified - moved to graduate NOT undergraduate crs"	02-03-812	1907.410	01	27	04

