The Graduate College
Rush University

Master of Science in
BIOTECHNOLOGY

Program Manual

FALL 2017

Program Director:
Gabriella Cs-Szabo, PhD

All course and performance requirements and Policies and Procedures listed here may be imposed on Biotechnology Program Students in addition to those which apply to all Graduate College Students and which are described in detail in the Rush University Bulletin under the heading of The Graduate College.

TABLE OF CONTENTS

Program Terminal Objectives

Master of Science in Biotechnology

Program objective: to employ science-based biomedical technology training to develop research professionals who are capable of directly entering a position in a biomedical research laboratory or continue their education in professional medical/biomedical programs.

Goal 1: Build strong knowledge in basic biomedical sciences

Student Learning Outcomes: By the end of the program, students will be able to

1. describe and discuss the molecular basis for life in living organisms. *(GCC 501-504*)
2. describe and discuss physiological and pharmacological mechanisms involved in drug action. *(GCC 510)*

Goal 2: Build competence in essential laboratory methods in biotechnology

Student Learning Outcomes: By the end of the program, students will be able to

1. develop the technical skills needed to independently perform and analyze experiments. *(BTN 531-537)*
2. develop skills in laboratory communication and management by maintaining the regulations of Good Laboratory Practices. *(BTN, 524, 526, 531-537and GLP training)*

Goal 3: Develop basic research skills

Student Learning Outcomes: By the end of the program, students will be able to

1. develop research strategies and apply the theoretical knowledge learned in classes and the methods learned in the laboratory to the solution of research problems in an ethical way. *(GCC 501-504, GCC 510; BTN 531-537, BTN 523, BTN 525, GCC 506-507)*
2. communicate scientific discoveries and to understand and use scientific literature as a basis for hypothesis driven research. *(GCC 508, BTN 523-525, BTN 537)*

Policies and Procedures

Master of Science in Biotechnology

Please refer to additional Policies and Procedures in the Rush University Bulletin

1. Program Accreditation

Rush University is approved to offer the Master of Science degree in Biotechnology by the State of Illinois Board of Higher Education. This program is also included in the usual accreditation process for Rush University by the Higher Learning Commission of Colleges and Schools.

2. Program Description

The Biotechnology Program aims to teach graduate-level basic science and to train students in biomedical research technology. The requirements for the Master of Science degree will be met within a two-semester enrollment of 34 semester hours. Typically, all students follow the same curricular plan, beginning in the Fall Semester. Students also participate in the University-level Interprofessional education non-credit course, IPE 502.

3. Student Performance Requirements

a. Class attendance

Although attendance in lecture courses is not required, it is strongly advised. These courses are graded by assignments and examinations. All laboratory courses, BTN 531-537, and other performance-based courses, such as GCC 506, GCC 507, GCC 508, BTN 523, 524, 525 and 526 require on-time attendance. Grading is accomplished by evaluation of student participation and performance on a daily basis as well as by assignments, presentations, quizzes and written examinations. IPE will be graded as P/NP.

b. Grading

Letter grades of A, B, C and F can be earned in all courses. A letter grade of B, or better, must be maintained for the average of all graded coursework.

Core Courses (GCC 501-504 and GCC 510) will be graded by examination of knowledge and application of the knowledge gained throughout of these courses. Laboratory theory and practice courses, such as BTN 531-537 and BTN 523-26, will be graded as the learning and acquisition of skills are evaluated on a daily basis during each class session. Students will continue to demonstrate their ability to instructors until the performance is acceptable. In some cases, examination by

written tests and oral presentations may be included. A letter grade will be assigned for each of these courses, as well.

c. Consequences of Failure

A limited time is available to correct failures. Therefore, every effort must be made by the student to accomplish Passing and B-level performance. There is no make-up exam offered to correct for a C grade. A C-grade can be compensated by a letter grade of A in another course with the same credit value. A grade point average of 3.0 must be kept for good academic standing and graduation from the program.

Failure to attend or failure to perform in a laboratory course will require an individual arrangement to demonstrate acceptable performance to the instructor or course director.

Multiple failures may result in interruption of the student's program, according to the determination of the Biotechnology Program Director with the advice of the Dean and the Graduate College Council. Each case of impaired performance will be considered individually.

d. The Status of Good Academic Standing

An interview with the Program Director will take place each term. These meetings are given as a One-On-One meeting to discuss academic progress, concerns, and future plans.

All students who maintain a B letter grade average while completing the required course sequence with full-time enrollment will be considered to be *In Good Academic Standing* within the Graduate College and are eligible for graduation with the M.S. degree.

Any student who fails to maintain a B letter grade average will be considered to be *In Academic Difficulty* until the deficiency is corrected. Those requirements will be determined by the Biotechnology Program Director with the advice of the Dean and the Graduate College Council. A student In Academic Difficulty is not eligible for graduation.

e. Course Evaluation

All courses offer a student-based course evaluation which is voluntary, anonymous, yet very valuable for program development. At the end of the Spring Semester, you will also be invited to fill-in a graduation survey. Your comments will be kept in confidence. Your suggestions are taken seriously and used to shape future offerings of this program.

f. Graduation Requirements

Students planning to graduate should:

- Be registered in the term in which they plan to graduate

- Complete an “Intent to Graduate” form online
- Be in good academic standing
- Complete all course work
- Complete a “Degree Approval” form and return it to the Registrar’s Office by the required date

g. Additional University Requirements

The Office of the Registrar manages required forms for graduation and these will be made available to you at the appropriate time before graduation. Please complete these forms within the required dates in order to insure availability of your diploma, cap and gownand other requirements of commencement celebration and graduation from the program and the University.

Requirements for separation from Rush University include the return of University identification badges, keys, lockers and laboratory equipment assigned to you at the beginning of the academic year.

Master of Science in Biotechnology

Curriculum 2017-18

Rush University Graduate College offers a nine-month, non-thesis Master's Degree program designed to prepare the student for a research career in the pharmaceutical and biotechnology industries or in the university laboratory. This program is also an excellent preparation for additional graduate-level training toward the Ph.D., M.D., D.D.S., PharmD and other advanced degrees.

Course work (please refer to course titles and numbers listed in the table):

Biotechnology students take the Graduate College Core Curriculum series of courses covering biochemistry; molecular biology and genetics; cell biology; tissue biology; and pharmacology.

Additional courses are designed specifically to prepare the student for competency in research and a career in the laboratory: Research Ethics; Biomedical Statistics; Scientific Writing; Experimental Design and Models of Disease; Good Laboratory Practices; Tools for Research; Communication; and Laboratory Management.

At the center of this program is the series of hands-on laboratory courses designed to cover the most important techniques and methods employed in research today. These laboratory experiences ensure proficiency in a wide variety of techniques, making the student highly competitive for employment in this ever-expanding and understaffed job market.

The program culminates in a capstone research experience, where students use their combined theoretical and practical knowledge to complete a small research project.

Students also participate in the University-level Interprofessional Education course to learn about how their knowledge and practice fits into the team-base health research and patient-based healthcare.

Course work:

Fall Semester		SH
BTN 523	Tools for Research	1
BTN 525	Experimental Design and Models of Disease	2
BTN 531	Laboratory Techniques I (introduction to laboratory; good laboratory practices, cell culture, data management)	2
BTN 532	Laboratory Techniques II (chromatography; electrophoresis; densitometry/imaging; ELISA)	2
BTN 533	Laboratory Techniques III (genomics; cloning, transformation; Transfection; PCR	2
GCC 501	Molecular Biology and Human Genetics	2
GCC 502	Cellular Biochemistry: Proteins and Metabolism)	2
GCC 503	Functional Cell Biology	1
		14

Spring Semester		
*BTN 524	Communications	1
*BTN 526	Laboratory Management	1
BTN 534	Laboratory Techniques IV (study design; animal handling; surgical techniques)	2
BTN 535	Laboratory Techniques V (HPLC; flow cytometry)	2
BTN 536	Laboratory Techniques VI (histology and immunohistochemistry; microscopy)	2
BTN 537	Research Capstone (Lab)	2
GCC 504	Functional Tissue Biology	3
GCC 506	Research Ethics	1
GCC 507	Biomedical Statistics	2
GCC 508	Scientific Writing	2
GCC 510	Introduction to Pharmacology	3
		20

Semester Hours Required for MS Degree: **34**

*Either BTN 524 or BTN 526 must be selected

IPE 502 throughout the Fall and Spring semesters no credit

BIOTECHNOLOGY
Faculty Roster

Program Director:

Gabriella Cs-Szabo, Ph.D.
Associate Dean
438 AAC (Armour Academic Facility)
942-2255
Gabriella_Cs-Szabo@rush.edu

Program Coordinator:

Kelly Boles, MBA
438 AAC
942-8331
Kelly_Boles@rush.edu

Laboratory Coordinators:

Lawrence Madsen
Biotechnology, 718 AAC
563-2435
Lawrence_Madsen@rush.edu

John Gallagher
Graduate College
Biotechnology, 718 AAC
563-2435
John_J_Gallagher@rush.edu

Course Directors:

GCC 501

Sanda Predescu, Ph.D.
953 Jelke
563-2437
Sanda_Predescu@rush.edu

GCC 502

Gabriella Cs-Szabo, Ph.D.
438 AAC
942-2255
Gabriella_Cs-Szabo@rush.edu

GCC 503

Jitesh Pratap, Ph.D.
1409B Jelke
563-4633
Jitesh_Pratap@rush.edu

GCC 504	**Hazel Lum, Ph.D.** 438 AAC 563-2560 Hazel_Lum@rush.edu
GCC 506 **GCC 510**	**Animesh Barua, Ph.D.** 414 Cohn 942-6666 Animesh_Barua@rush.edu
GCC 507	**Sanjib Basu, Ph.D.** 470 TOB (Triangle Office Building) 563-2723 Sanjib_Basu@rush.edu
GCC 508	**Hazel Lum, Ph.D.** 438 AAC 563-2560 Hazel_Lum@rush.edu
BTN 523	**Bill Hendey, Ph.D.** 412 Cohn 563-2173 Bill_Hendey@rush.edu
BTN 524	**Jorge A. Girotti, PhD, MA** Jorge_Girotti@rush.edu
BTN 525	**Paul Carvey, Ph.D.** Paul_Carvey@rush.edu
BTN 526 **BTN 533**	**Dan Predescu, Ph.D.** 1415 Jelke 563-2436 Dan_Predescu@rush.edu
BTN 531 **BTN 532** **BTN 535** **BTN 537**	**Tom Schmid, Ph.D.** 514 Cohn 942-23051 Tom_Schmid@rush.edu

BTN 534

Jeffrey Oswald, DVM
Comparative Research
Center , 206 Cohn
942-6576
Jeffrey_P_Oswald@rush.edu

BTN 536

Amarjit Virdi, Ph.D.
1303 Jelke
942-5143
Amarjit_Virdi@rush.edu

Kristin Al-Ghoul, Ph.D.
512D AAC
563-2672
Kristin_J_Al-Ghoul@rush.edu

Graduate College Peer Mentors: (BTN alumni)

Catherine Yuh, PhD Student
Catherine_Yuh@rush.edu

David Marmion, PhD Student
David_J_ Marmion@rush.edu

Isadora Calma, PhD Student
Isadora_Calma@rush.edu

Carl Gottschalk, PhD Student
Carl_G_Gottschalk@rush.edu

Natasha Ferguson, PhD Student
Natasha_Ferguson@rush.edu

IMPORTANT NAMES, NUMBERS AND LOCATIONS

Rush Graduate College: **Suite 438 AAC**

James Mulshine, M.D., Acting Dean
312-942-3589, James_Mulshine@rush.edu

Gabriella Cs-Szabo, Ph.D., Associate Dean
312-942-2255, Gabriella_Cs-Szabo@rush.edu

Kelly Boles, MBA; Program Coordinator
312-942-8331, Kelly_Boles@rush.edu

Laurice Knox, MPH, College Manager
312-563-3391, Laurice_Knox@rush.edu

Marisol Vega, Admissions Specialist
312-942-7994, Marisol_Vega@rush.edu

Office of Student Affairs:

4th floor AAC

Associate Provost of Student Affairs: Gayle Ward, JD
312-942-2285, Gayle_Ward@rush.edu

Registrar: Brenda Weddington, MEd
312- 942-5681, Brenda_Weddington@rush.edu

Bursar (Tuition): Patrick McNulty (1700 W. Van Buren St., Suite 282A)
312-942-6849, Patrick_J_McNulty@rush.edu

Financial Aid: Jill E. Gable, MBA
312-942-1754, Jill_Gable@rush.edu

International Services: international_students@rush.edu
312-942-5681

9th Floor AAC

Students Life (**Housing)**: Angela Branson
312-942-6302, Angela_Branson@rush.edu
www.rushu.rush.edu/studentlife/housing/index.html

Computer Center: METC
312-942-6799, METC_IDT@rush.edu

5th Floor AAC

Rush University Library Jo Cates, MLIS, Library Director
312-942-8735, Jo_Cates@rush.edu

RUSH GRADUATE COLLEGE FALL SEMESTER: 2017 WEEK: 1 BIOTECHNOLOGY

	Monday 9-04 LABOR DAY	**Tuesday** 9-05	**Wednesday** 9-06	**Thursday** 9-07	**Friday** 9-08
8:00 8:50	xxxxxxxxxxx	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC
9:00 9:50	xxxxxxxxxxx	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC
10:00 10:50	xxxxxxxxxxx	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC
11:00 11:50	xxxxxxxxxxx	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC ***Lab Book Check***
12:00 12:50	xxxxxxxxxxx				
1:00 1:50	xxxxxxxxxxx	GCC 501 1-3:30 AAC 540	BTN 525 1-3 AAC 539	GCC 501 1-3:30 AAC 540	
2:00 2:50	xxxxxxxxxxx	GCC 501 1-3:30 AAC 540	BTN 525 1-3 AAC 539	GCC 501 1-3:30 AAC 540	
3:00 3:50	xxxxxxxxxxx	GCC 501 1-3:30 AAC 540 BTN 523 section 1 3:30-4:30 METC 903 AAC		GCC 501 1-3:30 AAC 540	
4:00 4:50	xxxxxxxxxxx	BTN 523 section 1 3:30-4:30 METC 903 AAC			
5:00 5:50	xxxxxxxxxxx	BTN 523 sections 1/2 5:30-6 METC 903 AAC			

RUSH GRADUATE COLLEGE FALL SEMESTER: 2017 WEEK: 2 BIOTECHNOLOGY

	Monday 9-11	**Tuesday** 9-12	**Wednesday** 9-13	**Thursday** 9-14	**Friday** 9-15
8:00 8:50	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-10 722 AAC Quiz #1	
9:00 9:50	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-10 722 AAC Quiz #1	
10:00 10:50	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 10-12 722 AAC	BTN 525 10-12 AAC 539
11:00 11:50	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 AAC	BTN 531 8:30-12 722 AAC	BTN 531 10-12 722 AAC	BTN 525 10-12 AAC 539
12:00 12:50					
1:00 1:50	GCC 501 1-3:30 AAC 540	GCC 501 1-3:30 AAC 540	BTN 525 1-3 AAC 539	GCC 501 1-3:30 AAC 540	
2:00 2:50	GCC 501 1-3:30 AAC 540	GCC 501 1-3:30 AAC 540	BTN 525 1-3 AAC 539	GCC 501 1-3:30 AAC 540	
3:00 3:50	GCC 501 1-3:30 AAC 540	GCC 501 1-3:30 AAC 540 BTN 523 section 1 3:30-4:30 METC 903 AAC		GCC 501 1-3:30 AAC 540	
4:00 4:50		BTN 523 section 1 3:30-4:30 METC 903 AAC			
5:00 5:50		BTN 523 sections 1/2 5:30-6 METC 903 AAC			

RUSH GRADUATE COLLEGE FALL SEMESTER: 2017 WEEK: 3 BIOTECHNOLOGY

	Monday 9-18	**Tuesday** 9-19	**Wednesday** 9-20 GOLF OUTING	**Thursday** 9-21	**Friday** 9-22
8:00 8:50	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	
9:00 9:50	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	
10:00 10:50	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	
11:00 11:50	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	
12:00 12:50					
1:00 1:50	GCC 501 1-3:30 AAC 539	GCC 501 1-3:30 AAC 540		GCC 501 1-3:30 AAC 540	GCC 501 1-3:30 ***Review*** AAC 540
2:00 2:50	GCC 501 1-3:30 AAC 539	GCC 501 1-3:30 AAC 540		GCC 501 1-3:30 AAC 540	GCC 501 1-3:30 ***Review*** AAC 540
3:00 3:50	GCC 501 1-3:30 AAC 539	GCC 501 1-3:30 AAC 540		GCC 501 1-3:30 AAC 540	GCC 501 1-3:30 ***Review*** AAC 540
	BTN 525 3:30-5:30 AAC 539	BTN 523 section 1 3:30-4:30 METC 903 AAC			
4:00 4:50	BTN 525 3:30-5:30 AAC 539	BTN 523 section 1 3:30-4:30 METC 903 AAC			
5:00 5:50	BTN 525 3:30-5:30 AAC 539				
		BTN 523 sections 1/2 5:30-6 METC 903 AAC			

RUSH GRADUATE COLLEGE FALL SEMESTER: 2017 WEEK: 4 BIOTECHNOLOGY

	Monday 9-25	**Tuesday** 9-26	**Wednesday** 9-27	**Thursday** 9-28	**Friday** 9-29
8:00 8:50	BTN 531 8:30-10 722 AAC Quiz #2	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC
9:00 9:50	BTN 531 8:30-10 722 AAC Quiz #2	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC Exam #2	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC
10:00 10:50		BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC
11:00 11:50		BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC	BTN 531 8:30-12 722 AAC ***Lab Book Check***
12:00 12:50					
1:00 1:50	GCC 501 1-4:30 *** MIDTERM*** AAC 540	GCC 501 1-3:30 AAC 540	BTN 525 1-3 AAC 971	GCC 501 1-3:30 AAC 540	
2:00 2:50	GCC 501 1-4:30 *** MIDTERM*** AAC 540	GCC 501 1-3:30 AAC 540	BTN 525 1-3 AAC 971	GCC 501 1-3:30 AAC 540	
3:00 3:50	GCC 501 1-4:30 *** MIDTERM*** AAC 540	GCC 501 1-3:30 AAC 540 BTN 523 section 1 3:30-4:30 METC 903 AAC		GCC 501 1-3:30 AAC 540 BTN 525 3:30-5:30 AAC	
4:00 4:50	GCC 501 1-4:30 *** MIDTERM*** AAC 540	BTN 523 section 1 3:30-4:30 METC 903 AAC		BTN 525 3:30-5:30 AAC	
5:00 5:50		BTN 523 sections 1/2 5:30-6 METC 903 AAC		BTN 525 3:30-5:30 AAC	

RUSH GRADUATE COLLEGE FALL SEMESTER: 2017 WEEK: 5 BIOTECHNOLOGY

	Monday 10-02	**Tuesday** 10-03	**Wednesday** 10-04	**Thursday** 10-05	**Friday** 10-06
8:00 8:50					BTN 531 8:30-12 722 AAC
9:00 9:50		BTN 531 GLP 9-3 AAC (TBA)	BTN 531 GLP 9-1 AAC (TBA)	BTN 531 9-11 ***** GLP EXAM***** AAC (TBA)	BTN 531 8:30-12 722 AAC
10:00 10:50		BTN 531 GLP 9-3 AAC (TBA)	BTN 531 GLP 9-1 AAC (TBA)	BTN 531 9-11 ***** GLP EXAM***** AAC (TBA)	BTN 531 8:30-12 722 AAC
11:00 11:50		BTN 531 GLP 9-3 AAC	BTN 531 GLP 9-1 AAC		BTN 531 8:30-12 722 AAC
12:00 12:50		BTN 531 GLP 9-3 AAC	BTN 531 GLP 9-1 AAC		
1:00 1:50	GCC 501 1-3:30 AAC 540	BTN 531 GLP 9-3 AAC	BTN 525 1-3 AAC 971	GCC 501 1-3:30 AAC 540	
2:00 2:50	GCC 501 1-3:30 AAC 540	BTN 531 GLP 9-3 AAC	BTN 525 1-3 AAC 971	GCC 501 1-3:30 AAC 540	
3:00 3:50	GCC 501 1-3:30 AAC 540	BTN 531 GLP 9-3 AAC		GCC 501 1-3:30 AAC 540	
4:00 5:00					
5:00 6:00					

RUSH GRADUATE COLLEGE FALL SEMESTER: 2017 WEEK: 6 BIOTECHNOLOGY

	Monday 10-09	**Tuesday** 10-10	**Wednesday** 10-11	**Thursday** 10-12	**Friday** 10-13
8:00 8:50			BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC
9:00 9:50	BTN 525 ***Exam I*** 9-12 AAC 540	BTN 531 9-12 722 AAC Quiz #3	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC
10:00 10:50	BTN 525 ***Exam I*** 9-12 AAC 540	BTN 531 9-12 722 AAC Quiz #3	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC
11:00 11:50	BTN 525 ***Exam I*** 9-12 AAC 540	BTN 531 9-12 722 AAC Quiz #3	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC
12:00 12:50					
1:00 1:50	GCC 501 1-3:30 AAC 540	GCC 501 1-3:30 AAC 540	BTN 525 1-3 AAC 971	GCC 501 1-3:30 AAC 540	
2:00 2:50	GCC 501 1-3:30 AAC 540	GCC 501 1-3:30 AAC 540	BTN 525 1-3 AAC 971	GCC 501 1-3:30 AAC 540	
3:00 3:50	GCC 501 1-3:30 AAC 540	GCC 501 1-3:30 AAC 540 BTN 523 section 1 3:30-4:30 METC 903 AAC		GCC 501 1-3:30 AAC 540	
4:00 4:50		BTN 523 section 1 3:30-4:30 METC 903 AAC			
5:00 5:50		BTN 523 sections 1/2 5:30-6 METC 903 AAC			

RUSH GRADUATE COLLEGE FALL SEMESTER: 2017 WEEK: 7 BIOTECHNOLOGY

	Monday 10-16	**Tuesday** 10-17	**Wednesday** 10-18	**Thursday** 10-19	**Friday** 10-20
8:00 8:50	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC
9:00 9:50	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC
10:00 10:50	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC Quiz #1	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC
11:00 11:50	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC Quiz #1	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC
12:00 12:50					
1:00 1:50	GCC 501 1-3:30 ***Review*** AAC 540	GCC 501 1-4:30 *** FINAL EXAM*** AAC 540		GCC 502 1-3:30 AAC 540	GCC 503 1-3:30 AAC 540
2:00 2:50	GCC 501 1-3:30 ***Review*** AAC 540	GCC 501 1-4:30 *** FINAL EXAM*** AAC 540		GCC 502 1-3:30 AAC 540	GCC 503 1-3:30 AAC 540
3:00 3:50	GCC 501 1-3:30 ***Review*** AAC 540 BTN 523 section 1 3:30-4:30 METC 903 AAC	GCC 501 1-4:30 *** FINAL EXAM*** AAC 540		GCC 502 1-3:30 AAC 540	GCC 503 1-3:30 AAC 540
4:00 4:50	BTN 523 section 1 3:30-4:30 METC 903 AAC	GCC 501 1-4:30 *** FINAL EXAM*** AAC 540			
5:00 5:50	BTN 523 sections 1/2 5:30-6 METC 903 AAC				

RUSH GRADUATE COLLEGE **FALL SEMESTER: 2017** **WEEK: 8** **BIOTECHNOLOGY**

	Monday 10-23	**Tuesday** 10-24	**Wednesday** 10-25	**Thursday** 10-26	**Friday** 10-27
8:00 8:50	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC		
9:00 9:50	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 9-12 722 AAC Quiz #2	
10:00 10:50	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 9-12 722 AAC Quiz #2	
11:00 11:50	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 9-12 722 AAC	
12:00 12:50					
1:00 1:50	GCC 502 1-3:30 AAC 540	GCC 502 1-3:30 AAC 540	BTN 525 1-3 AAC 950	GCC 503 1-3:30 AAC 540	GCC 503 1-3:30 AAC 540
2:00 2:50	GCC 502 1-3:30 AAC 540	GCC 502 1-3:30 AAC 540	BTN 525 1-3 AAC 950	GCC 503 1-3:30 AAC 540	GCC 503 1-3:30 AAC 540
3:00 3:50	GCC 502 1-3:30 AAC 540	GCC 502 1-3:30 AAC 540		GCC 503 1-3:30 AAC 540	GCC 503 1-3:30 AAC 540
		BTN 523 section 1 3:30-4:30 METC 903 AAC			
4:00 4:50		BTN 523 section 1 3:30-4:30 METC 903 AAC			
5:00 5:50		BTN 523 sections 1/2 5:30-6 METC 903 AAC			

RUSH GRADUATE COLLEGE FALL SEMESTER: 2017 WEEK: 9 BIOTECHNOLOGY

	Monday 10-30	Tuesday 10-31	Wednesday 11-01	Thursday 11-02	Friday 11-03
8:00 8:50		BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC
9:00 9:50		BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC
10:00 10:50		BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC
11:00 11:50		BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC
12:00 12:50					
1:00 1:50	GCC 502 1-3:30 AAC 540 Quiz #1	GCC 502 1-3:30 AAC 540	BTN 525 1-3 AAC 950	GCC 503 1-3:30 AAC 540	GCC 503 1-3:30 AAC 540
2:00 2:50	GCC 502 1-3:30 AAC 540	GCC 502 1-3:30 AAC 540	BTN 525 1-3 AAC 950	GCC 503 1-3:30 AAC 540	GCC 503 1-3:30 AAC 540
3:00 3:50	GCC 502 1-3:30 AAC 540	GCC 502 1-3:30 AAC 540		GCC 503 1-3:30 AAC 540	GCC 503 1-3:30 AAC 540
		BTN 523 section 1 3:30-4:30 METC 903 AAC			
4:00 4:50		BTN 523 section 1 3:30-4:30 METC 903 AAC			
5:00 5:50		BTN 523 sections 1/2 5:30-6 METC 903 AAC			

RUSH GRADUATE COLLEGE FALL SEMESTER: 2017 WEEK: 10 BIOTECHNOLOGY

	Monday 11-06	**Tuesday** 11-07	**Wednesday** 11-08	**Thursday** 11-09	**Friday** 11-10
8:00 8:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC
9:00 9:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC
10:00 10:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC
11:00 11:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC	BTN 532 8:30-12 722 AAC
12:00 12:50					
1:00 1:50	GCC 502 1-3:30 AAC 540	GCC 502 1-3:30 AAC 540	BTN 525 1-3 AAC 950	GCC 503 1-3:30 AAC 540	GCC 503 1-3:30 AAC 540
2:00 2:50	GCC 502 1-3:30 AAC 540	GCC 502 1-3:30 AAC 540	BTN 525 1-3 AAC 950	GCC 503 1-3:30 AAC 540	GCC 503 1-3:30 AAC 540
3:00 3:50	GCC 502 1-3:30 AAC 540	GCC 502 1-3:30 AAC 540		GCC 503 1-3:30 AAC 540	GCC 503 1-3:30 AAC 540
		BTN 523 section 1 3:30-4:30 METC 903 AAC			
4:00 4:50		BTN 523 section 1 3:30-4:30 METC 903 AAC			
5:00 5:50		BTN 523 sections 1/2 5:30-6 METC 903 AAC			

RUSH GRADUATE COLLEGE FALL SEMESTER: 2017 WEEK: 11 BIOTECHNOLOGY

	Monday 11-13	**Tuesday** 11-14	**Wednesday** 11-15	**Thursday** 11-16	**Friday** 11-17
8:00 8:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC		
9:00 9:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC		BTN 532 9-12 722 AAC Quiz #3 (rm TBA)
10:00 10:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC		BTN 532 9-12 722 AAC Quiz #3
11:00 11:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC		BTN 532 9-12 722 AAC
12:00 12:50					
1:00 1:50	GCC 502 1-3:30 AAC 540	GCC 502 ***Review*** 1-3:30 AAC 540		GCC 502 *****MIDTERM***** 1-4:30 AAC 540	GCC 503 1-3:30 AAC 540
2:00 2:50	GCC 502 1-3:30 AAC 540	GCC 502 ***Review*** 1-3:30 AAC 540		GCC 502 *****MIDTERM***** 1-4:30 AAC 540	GCC 503 1-3:30 AAC 540
3:00 3:50	GCC 502 1-3:30 AAC 540	GCC 502 ***Review*** 1-3:30 AAC 540 BTN 523 section 1 3:30-4:30 METC 903 AAC		GCC 502 *****MIDTERM***** 1-4:30 AAC 540	GCC 503 1-3:30 AAC 540
4:00 4:50		BTN 523 section 1 3:30-4:30 METC 903 AAC		GCC 502 *****MIDTERM***** 1-4:30 AAC 540	
5:00 5:50		BTN 523 sections 1/2 5:30-6 METC 903 AAC			

RUSH GRADUATE COLLEGE FALL SEMESTER: 2017 WEEK: 12 BIOTECHNOLOGY

	Monday 11-20	**Tuesday** 11-21	**Wednesday** 11-22	**Thursday** 11-23	**Friday** 11-24
8:00 8:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC		THANKSGIVING	
9:00 9:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC			
10:00 10:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC			
11:00 11:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC			
12:00 12:50					
1:00 1:50	GCC 503 1-3:30 AAC 540	GCC 503 ***Review*** 1-3:30 AAC 540			
2:00 2:50	GCC 503 1-3:30 AAC 540	GCC 503 ***Review*** 1-3:30 AAC 540			
3:00 3:50	GCC 503 1-3:30 AAC 540	GCC 503 ***Review*** 1-3:30 AAC 540			
		BTN 523 section 1 3:30-4:30 METC 903 AAC			
4:00 4:50		BTN 523 section 1 3:30-4:30 METC 903 AAC			
5:00 5:50		BTN 523 sections 1/2 5:30-6 METC 903 AAC			

RUSH GRADUATE COLLEGE FALL SEMESTER: 2017 WEEK: 13 BIOTECHNOLOGY

	Monday 11-27	Tuesday 11-28	Wednesday 11-29	Thursday 11-30	Friday 12-01
8:00 8:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC		BTN 532 8:30-12 FINAL EXAM AAC (TBA)
9:00 9:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC		BTN 532 8:30-12 FINAL EXAM AAC (TBA)
10:00 10:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC		BTN 532 8:30-12 FINAL EXAM AAC
11:00 11:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC		BTN 532 8:30-12 FINAL EXAM AAC
12:00 12:50					
1:00 1:50	GCC 503 ***Exam*** 1-4 AAC 540	GCC 502 1-3:30 AAC 540		GCC 502 1-3:30 AAC 540	
2:00 2:50	GCC 503 ***Exam*** 1-4 AAC 540	GCC 502 1-3:30 AAC 540		GCC 502 1-3:30 AAC 540	
3:00 3:50	GCC 503 ***Exam*** 1-4 AAC 540	GCC 502 1-3:30 AAC 540 BTN 523 section 1 3:30-4:30 METC 903 AAC		GCC 502 1-3:30 AAC 540	
4:00 4:50		BTN 523 section 1 3:30-4:30 METC 903 AAC			
5:00 5:50		BTN 523 sections 1/2 5:30-6 METC 903 AAC			

RUSH GRADUATE COLLEGE FALL SEMESTER: 2017 WEEK: 14 BIOTECHNOLOGY

	Monday 12-04	Tuesday 12-05	Wednesday 12-06	Thursday 12-07	Friday 12-08
8:00 8:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC		
9:00 9:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC		
10:00 10:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC		
11:00 11:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC		
12:00 12:50					
1:00 1:50	GCC 502 1-3:30 AAC 540	GCC 502 1-3:30 AAC 540 Quiz #2	BTN 525 1-4PM AAC 539 EXAM #2	GCC 502 1-3:30 AAC 540	
2:00 2:50	GCC 502 1-3:30 AAC 540	GCC 502 1-3:30 AAC 540	BTN 525 1-4PM AAC 539 EXAM #2	GCC 502 1-3:30 AAC 540	
3:00 3:50	GCC 502 1-3:30 AAC 540	GCC 502 1-3:30 AAC 540 BTN 523 section 1 3:30-4:30 METC 903 AAC	BTN 525 AAC 539 1-4PM EXAM #2	GCC 502 1-3:30 AAC 540	
4:00 4:50		BTN 523 section 1 3:30-4:30 METC 903 AAC			
5:00 5:50		BTN 523 sections 1/2 5:30-6 METC 903 AAC			

RUSH GRADUATE COLLEGE FALL SEMESTER: 2017 WEEK: 15 BIOTECHNOLOGY

	Monday 12-11	**Tuesday** 12-12	**Wednesday** 12-13	**Thursday** 12-14	**Friday** 12-15
8:00 8:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	
9:00 9:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	
10:00 10:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	
11:00 11:50	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	BTN 533 8:30-12 722 AAC	
12:00 12:50	BTN 525 ***Manuscripts Due*** At Noon	BTN 523 **Projects Due**			
1:00 1:50	GCC 502 1-3:30 AAC 540	GCC 502 ***Review*** 1-3:30 AAC 540			GCC 502 ***FINAL EXAM*** 1-4:30 AAC 540
2:00 2:50	GCC 502 1-3:30 AAC 540	GCC 502 ***Review*** 1-3:30 AAC 540			GCC 502 ***FINAL EXAM*** 1-4:30 AAC 540
3:00 3:50	GCC 502 1-3:30 AAC 540	GCC 502 ***Review*** 1-3:30 AAC 540			GCC 502 ***FINAL EXAM*** 1-4:30 AAC 540
4:00 4:50					GCC 502 ***FINAL EXAM*** 1-4:30 AAC 540
5:00 5:50					

RUSH GRADUATE COLLEGE FALL SEMESTER: 2017 WEEK: 16 BIOTECHNOLOGY

	Monday 12-18	**Tuesday** 12-19	**Wednesday** 12-20	**Thursday** 12-21	**Friday** 12-22
8:00 8:50					
9:00 9:50		BTN 525 9-12 *****PRESENTATIONS*** AAC 539	BTN 525 9-12 *****PRESENTATIONS*** AAC 539	BTN 533 9-12 AAC (TBA) EXAM	
10:00 10:50		BTN 525 9-12 *****PRESENTATIONS*** AAC 539	BTN 525 9-12 *****PRESENTATIONS*** AAC 539	BTN 533 9-12 AAC (TBA) EXAM	
11:00 11:50		BTN 525 9-12 *****PRESENTATIONS*** AAC 539	BTN 525 9-12 *****PRESENTATIONS*** AAC 539	BTN 533 9-12 AAC (TBA) EXAM	
12:00 12:50					
1:00 1:50		BTN 525 1-5 *****PRESENTATIONS*** AAC 539	BTN 525 1-4 *****PRESENTATIONS*** AAC 539		
2:00 2:50		BTN 525 1-5 *****PRESENTATIONS*** AAC 539	BTN 525 1-4 *****PRESENTATIONS*** AAC 539		
3:00 3:50		BTN 525 1-5 *****PRESENTATIONS*** AAC 539	BTN 525 1-4 *****PRESENTATIONS*** AAC 539		
4:00 4:50		BTN 525 1-5 *****PRESENTATIONS*** AAC 539			

Course Syllabus: GCC501 - **MOLECULAR BIOLOGY & HUMAN GENETICS** **Fall, 2017**

Instructor Name	**Sanda PREDESCU, PhD**
Email	sanda_predescu@rush.edu
Work Phone	**312 563 2437**
Fax	**312 942 0339**
Preferred Method of Contact	**email**
Office Hours: upon request	
Credit Hours	**2 credit hour**

Course Purpose/Description

The Graduate Core Curriculum (GCC) 501 is designed to give a basic background in current Molecular Biology and Human Genetics. This course provides a transition to other GCC courses and is essential to much of modern biology, no matter what the field of study. It describes, in its most basic form, the mechanisms of how organisms live, reproduce and evolve. The major themes are prokaryotic and eukaryotic DNA replication, chromosomal structure and function, gene expression and protein function. The course will also include some basic human genetics, cancer genetics and virology.

Course Format

The GCC510 course involves interactive lecturing to promote active learning, heighten attention and motivation, give feedback to the teacher and the student.

Meeting Days and Times

Day of the week	Dates	Start time	room	Topic/lecture	Instructor
Tuesday	09/05	1:00 – 3:30	976	Introduction to **MOLECULAR BIOLOGY & HUMAN GENETICS** course **Lecture 1.** DNA structure and biochemical characteristics, prokaryotic vs. eukaryotic organisms, Gene transfer mechanisms, mobile DNA, chromosome packaging, DNA replication	S. Predescu N. Lurain
Thursday	09/07	1:00 – 3:30	976	**Lecture 2.** Genetic code, mutagenesis, recombination; DNA repair mechanisms	N. Lurain
Monday	09/11	1:00 – 3:30	976	**Lecture 3.** Recombinant DNA: principles, DNA cloning techniques and strategies	N. Lurain

Tuesday	09/12	1:00 – 3:30	976	**Lecture 4.** Identifying and analyzing genomic DNA and recombinant molecules.	N. Lurain
Thursday	09/14	1:00 – 3:30	976	**Lecture 5**. RNA structure and transcription apparatus of prokaryotes. Inheritance of genes in Bacteria	S. Shafikhani
Monday	09/18	1:00 – 3:30	976	**Lecture 6.** Transcriptional control of gene expression: regulatory elements in prokaryotes vs. eukaryotes. Analysis of promoters and DNA-binding proteins **Quiz 1 Lectures 1 – 5;**	S. Predescu S. Predescu
Tuesday	09/19	1:00 – 3:30	976	**Lecture 7.** Post-transcriptional gene control: synthesis and processing of prokaryotic and eukaryotic organisms. RNA capping, polyadenylation, and splicing. Role of snRNPs, RNA editing and chemical modifications	D. Predescu
Thursday	09/21	1:00 – 3:30	976	**Lecture 8.** Protein Synthesis.	T. Schmid
Friday	09/22	1:00 – 3:30	976	Review/ Midterm Exam	S. Predescu D. Predescu S. Shafikani N. Lurain
Monday	09/25	1:00 – 3:30	976	**MIDTERM EXAM** (Lectures 1-8)	S. Predescu
Tuesday	09/26	1:00 – 4:00	976	**Lecture 9.** Organization of the human genome.	S. Kanangat
Thursday	09/28	1:00 – 3:30	976	**Lecture 10.** Genomic analysis. Major milestones in mapping the human genome. DNA markers, genetic variation and physical mapping via clone contigs	S. Kanangat
Monday	10/02	1:00 – 3:30	976	**Lecture 11.** Epigenetics. Principles of epigenetics and epigenetic mechanisms. Epigenetic dysregulation in human disease. Epigenetic factors in gene regulation	D. Predescu
Thursday	10/05	1:00 – 3:30	976	**Lecture 12.** Genetic mapping: quantitative genetics and linkage disequilibrium	J. Pratap
Monday	10/09	1:00 – 3:30	976	**Lecture 13.** Approaches to mapping and identifying genetic susceptibility to complex disease. Contributions of environment and epigenetic factors. **Quiz 2 (lectures 9 - 12)**.	D. Predescu S. Predescu

Tuesday	10/10	1:00 – 3:30	976	**Lecture 14.** Genetics of cancer: evolution of cancer, oncogenes, tumor suppressor genes and chromosomal instability, signal transduction pathways.	C. Maki
Thursday	10/12	1:00 – 3:30	976	**Lecture 15.** Virus systems in molecular biology. Genetic tools to fight viral outbreaks	D. Predescu
Monday	10/16	1:00 – 3:30	976	Review/ Final Exam (lectures 9 -15)	S. Predescu Lecturers
Tuesday	10/17	1:00 – 3:30	976	**FINAL EXAM** (Lectures 9 -15)	S. Predescu

Required Text(s) *(full citation)*
There are **two required** textbooks for this course. These can be obtained from the Rush University Bookstore located on the ground floor of the Academic Building.

Molecular Cell Biology 8th Edition, 2016 - Lodish et al.
W. H. Freeman Publisher

Genetics and Genomics in Medicine
Edition: 1st Tom Strachan, Judith Goodship, Patrick Chinnery

Recommended Text(s) *(full citation)*
None

Required Equipment/Uniforms
NA

Software *(full citation)*
NA

Pre-requisites (courses, achieved competencies)
None

Course Learning Objectives

- To introduce the essential principles and processes of molecular biology and human genetics.
- To introduce some of the basic methods and current experimental techniques used in biological research.
- To demonstrate major unifying principles that applies to all living organisms.

Proctored Assessment(s) *(as applicable)*
NA

Attendance

Class attendance is important. Lecturers may emphasize in class certain segments of the lecture for better understanding, clarification and preparation for the exams. There will also be review sessions for additional preparations for the examinations.

Late Work
The format of the class will require **reading that day's assignment BEFORE** coming to class. Each class will begin with time for specific questions related to the previous lecture material. Problem set assignments will be given at the end of each lecture and answers to these questions are required. If a topic is not covered in class, but is covered in the reading assignment, the student is responsible for it. Students having difficulty understanding the material may come and ask the lecturer or their tutor either after class or by appointment.

Learning Groups *(as applicable)*
NA

Evaluation
There will be **two exams** and **two quizzes** given during the course. The first exam and the first quiz will include material from the first half of the course, and the second exam and remaining quiz will only include lectures from the latter part of the course. All quizzes and exams are taken in class, and review sessions will be given prior to the exams. Questions will be from lecture materials, reading assignments, and class discussions.

Grading Scale

Grades will be based on cumulative performance on the two examinations (80%) and 4 quizzes (20%). The following is a guide for assigning a letter grade:

85-100%	A
70-84%	B
55-69%	C
< 55%	F

Course communication, expectations, and etiquette
The purpose of the discussion boards is to allow students to freely exchange ideas. It is imperative to remain respectful of all viewpoints and positions and, when necessary, agree to respectfully disagree. While active and frequent participation is encouraged, cluttering a discussion board with inappropriate, irrelevant, or insignificant material will not earn additional points and may result in receiving less than full credit. Frequency is not unimportant, but content of the message is paramount. Please remember to cite all sources—when relevant—in order to avoid plagiarism.

Disability Accommodations
Rush University wishes to ensure that access to its facilities, programs and services are available to students with disabilities. The University provides reasonable accommodations to all students on a non-discriminatory basis consistent with legal requirements as outlined in the Americans with Disabilities Act (ADA) of 1990 and the Rehabilitation Act of 1973 and applicable implementing regulations of these statutes. A reasonable accommodation is a modification or adjustment to an instructional activity, facility, program or service that enables a qualified student with a disability to have an equal opportunity to participate in all Rush University student activities.

Additional information on disability accommodations and programs can be found at: http://www.rushu.rush.edu/catalog/aboutrush/disabilityrights.html.

Academic Honesty and Conduct

Rush University students and faculty belong to an academic community with high scholarly standards. As essential as academic honesty is to the relationship of trust fundamental to the educational process, academic dishonesty violates one of the most basic ethical principles of an academic community, and will result in sanctions imposed under the University's disciplinary system.

Students will be held responsible for adhering to the policy on student academic honesty and conduct as stated in the RUCatalog. Academic dishonesty will result in sanctions imposed under the University's disciplinary system. Disciplinary actions range from warning, probation, suspension or expulsion from the University/Medical Center.

Additional information on Academic Honesty and Conduct can be found at: https://www.rushu.rush.edu/catalog/acadresources/academichonesty.html

Intellectual properties protection

A core mission of Rush is to improve the public health. For this reason, Rush University Medical Center ("Medical Center") supports the research efforts of its faculty, staff, employees and students (collectively "Covered Individuals‖). One way this is accomplished is by seeking patent protection for new technologies so they can be transferred to the private sector through licensing for further development, commercialization and distribution to the public.

All materials contained within this syllabus, course and course materials, whether in written form or presented any electronic transmission medium, represent the intellectual property of faculty or Rush University Medical Center. Students are prohibited from sharing or transmitting content or materials through any media without express consent or permission of the copyright holder. All rights reserved. Copyright (Rush University Medical Center (or faculty) and year).

Additional information on Intellectual Properties protection can be found at: https://www.rushu.rush.edu/servlet/BlobServer?blobcol=urlfile&blobtable=document&blobkey=id&blobwhere=1284398791946&blobheader=application%2Fpdf&blobnocache=true

FERPA

Rush University takes seriously its commitment to protect the privacy of our students and their education records. In addition to upholding the Family Educational Rights and Privacy Act of 1974 (FERPA), Rush University has taken further steps to protect a person's privacy by extending similar benefits afforded to enrolled students under FERPA to individuals who are applying for admission. If a specific privacy/confidentiality question is not answered in this text, please contact the Office of the Registrar.

Nothing in this policy may be construed to prohibit the University from disclosing information provided to the institution under the Violent Crime Control and Law Enforcement Act concerning sex offenders who are required to register.

Additional information on FERPA can be found at: http://www.rushu.rush.edu/servlet/Satellite?MetaAttrName=meta_services&ParentId=1320160786561&ParentType=RushUnivLevel2Page&c=content_block&cid=1320160786609&level1-

p=2&level1-pp=1204497836743&level1-ppp=1204497836743&pagename=Rush%2Fcontent_block%2FContentBlockDetail&rendermode=previewnoinsite

HIPPA, Access, Use and Disclosure
TBD

Course Schedule and program

Important Note: Changes may occur to the syllabus at the instructor's discretion. When changes are made, students will be notified via an announcement.

Week 1 (begin on Monday and end on Sunday; this structure is *especially* important for asynchronous online courses)

Overview

Session Learning Objectives (performance outcomes/objectives)

After this session, the student will be able to:

-

Course Activities [any learning experience where feedback from faculty is NOT provided]

Textbook Reading

TBD BY FACULTY

Online Reading

TBD BY FACULTY

Multimedia

TBD BY FACULTY

Discussion Board (as required by course format)

Each session you are required to participate in the session-specific discussion board forum. Your participation in both posting and responding to other students' comments is graded. For this session's discussion topic(s), visit the discussion board in Blackboard.

Assignments/Assessments [any learning experience where faculty provides any feedback]

TBD BY FACULTY

Web Session (Synchronous meetings)

GCC 501 TUTORS

FALL, 2016

NAME/email address	**PHONE #**
Ricardo Perez Email: Ricardo_prerez@rush.edu	312-563-3632
Salvatore DiBartolo Email: Salvatore_Dibartolo@rush.edu	312-942-4007

RUSH UNIVERSITY

Course Syllabus: GCC 502 Cellular Biochemistry **Fall, 2017**

Instructor Name	Gabriella Cs-Szabo, Ph.D.
Email	Gabriella_Cs-Szabo@rush.edu
Work Phone	312.942.2255
Fax	312.942.7441
Preferred Method of Contact	Gabriella_Cs-Szabo@rush.edu
Office Hours:	Upon Request
Credit Hours	2

Course Purpose/Description The Cellular Biochemistry unit of the Graduate College Curriculum (GCC 502) is designed to be the first exposure of graduate students to biochemistry and cell biology, building on their working knowledge of inorganic and organic chemistry a well as molecular biology (GCC 501). The objective of this course is to provide students with a background in the structure and function of cells in major biomolecules, metabolism and its regulations; and thus serve as a background for GCC 503 and GCC 504. Lectures will also introduce the relevance of the topic to human health and diseases.

Course Format Face-to-Face

Meeting Days and Times Oct 19th -Dec 15th Mondays, Tuesdays and Thursdays between 1:00 - 3:30 P.M. in 540 AAC

Required Text(s) Molecular Cell Biology, 8th edition, 2016 by Lodish, Harvey; Berk, Arnold; Kaiser, Chris A. W. H. Freeman & Company, ISBN-13: 9781464183393

Recommended Text(s) Optional readings for concepts - Lippincott's Illustrated Review of Biochemistry, 6th edition, 2014. Lippincott Williams & Wilkins, ISBN: 978-1-4511-7562-2.

Lecture Handouts

You will be given lecture handouts that contain the material that we will use in our lectures. We recommend that you read the handouts ahead of time, bring them to class and add notes to it. These comprehensive handouts are designed to allow you to follow the lecture closely without bringing your book to class. Please use the textbook as a reference. Reading the textbook in detail may be of help in preparation to the examinations. Lecture handouts will also contain lecture objectives that are helpful in preparation to the tests.

Required Equipment/Uniforms N/A

Software N/A

Pre-requisites (courses, achieved competencies) N/A

Course Learning Objectives

Upon completion of the course, the student will be able to:

1. recognize that the function of a biomolecule is dependent on its structure.
2. describe the function of biomolecules in normal cellular, tissue, organ and systemic processes.
3. describe membrane-linked and intracellular processes that link the signal from the environment to the response of the cell.
4. demonstrate knowledge about cellular intermediary metabolic pathways and their regulations; and the interplay of pathways to generate energy and all necessary components for a living organism.

Course Content

The course covers the following topics:

1. Biomolecules: their structure and function
    a. Protein structure and function
        Enzymes
        Protein folding and related disorders
    b. Carbohydrate structure and function
    c. Lipid structure and function

.

2. Cellular processes
    a. Receptors, receptor families
    b. Signaling pathways and their cross-talk
    c. Second messengers and calcium signaling

3. Intermediary metabolism
    a. Generation of cellular energy, common pathways
    b. Carbohydrate metabolism
    c. Lipid metabolism
    d. Amino acid metabolism
    e. Hormonal regulation of metabolism
    f. Interpretation of metabolism

Self-Directed Learning

Students are expected to study part of the relevant material independently. Every lecturer will supply students with reading material to supplement the topic of the lectures. The reading material may be assigned from the textbook required for this course or selected from other sources (copies may be given by the instructor). Written homework assignments will also be given to the students that will count towards the final course grade.

Rules for Success

- Read assigned chapters and/or the handout before coming to class.
- Attend every class period.
- Complete reading assignments.
- Complete self-study sections.
- Study for understanding of the concepts, not just memorization of "facts".
- Go over the lecture and reading assignments after class, and take extra notes from the reading.
- Consider studying with other students outside of class to discuss the material and prepare for quizzes and exams.

Proctored Assessment(s)

Monday Oct 30th 540 AAC Quiz #1 1:00-1:20PM
Tuesday Dec 5th 540 AAC Quiz #2 1:00-1:20PM
Thursday Nov 16th 540 AAC Midterm Exam 1:00-4:30PM
Thursday Dec 15th 540 AAC Final Exam 1:00-4:30PM

Attendance

Since lectures may clarify complicated points, attendance in class is highly recommended. Also, attendance at lectures will not only be helpful in giving logic to the instruction but also in understanding the most important points for testing. Since there will be several instructors, class attendance will allow you to better understand the information in the lecture handouts and the relative emphasis each instructor places on the information. The instructor may emphasize in class certain topics more than others and will help guide your preparation for testing.

Lecturers will ask questions during the lectures and bring up problems for discussion. Consequently, active participation is required from the students. Some of these questions/problems will be in your handouts, thus you are encouraged to think about them before coming to class.

Permission from the course director must be obtained in advance to take examinations or quizzes at times other than those scheduled. Permission will not be granted for other than exceptional circumstances such as a letter from a physician.

Late Work

According to GCC guidelines, there is no make-up examination offered to raise the grade from B to A or from C to B. A grade of C in these courses should be balanced by grades of A on other courses. If a student fails GCC 502 with a grade of F, the student may be given a makeup examination covering the entire course material if permitted by the Course Director, institutional policies and mandates.

Learning Groups

N/A

Opportunity for Additional Assistance

Students having difficulty understanding the material may seek assistance form teaching faculty ; talk to the lecturer and/or the Course Director either after class or by appointment. In addition, group tutoring by an upper-class Ph.D. student will be available for GCC 502 students. Meeting times will be determined on the first day of class. Additional group tutoring and review is scheduled before the two examinations (please, refer to the schedule).

Evaluation

Grades will be based on cumulative performance on the two examinations (80%) and performance on written quizzes (20%).

Quiz #1	10%
Midterm Examination	45%
Quiz #2	10%
Final Examination	35%

Examination Policy

There will be 2 quizzes and 2 examinations during the course. Your testing will be from the lecture material, which contains the content of the handouts, and discussion during class. Thus, it is important for the student to attend class and take additional notes on the material covered during class. Questions for these tests will be graduate level essay questions requiring thinking and problem solving rather than just regurgitating basic knowledge.
All examinations will be of the closed-book type; the use of any notes or books or prompting by others during examinations shall constitute unprofessional and unethical behavior and bears appropriate consequences.

Grading Scale

85-100%	A
70-84.9%	B
55-69.9%	C
Under 55%	F

Course communication, expectations, and etiquette

Peer-to-Peer and student-to-faculty communication is expected to be professional. Communication from the course director and teaching faculty will be through the GCCC 502 shell on Blackboard. Course materials including lecture slides will also be posted on Blackboard.

Contacting Instructors

It is recommended that e-mail be used as much as possible when students have questions about the course, since instructors do not have office hours. It is also recommended that students check their email for messages from the course director and faculty. If you wish to meet with the instructor, it is best to arrange appointments through e-mail. Your key-person in any matter is your Course Director. Please, feel free to contact Dr. Cs-Szabo with any matter that is related to your class work.

Lecturers:

Dr. G. Cs-Szabo	Gabriella_Cs-Szabo@rush.edu
Dr. C. Forsyth	Christopher_Forsyth@rush.edu
Dr. T. Schmid	Tom_Schmid@rush.edu
Dr. S. Predescu	Sanda_Predescu@rush.edu
Dr. D. Morgan	Deri_Morgan@rush.edu

Tutors:

Ricardo Perez	Ricardo_Perez@rush.edu

Disability Accommodations

Rush University wishes to ensure that access to its facilities; programs and services are available to students with disabilities. The University provides reasonable accommodations to all students on a non-discriminatory basis consistent with legal requirements as outlined in the Americans with Disabilities Act (ADA) of 1990 and the Rehabilitation Act of 1973 and applicable implementing regulations of these statutes. A reasonable accommodation is a modification or adjustment to an instructional activity, facility, program or service that enables a qualified student with a disability to have an equal opportunity to participate in all Rush University student activities.

Additional information on disability accommodations and programs can be found at:
http://www.rushu.rush.edu/catalog/aboutrush/disabilityrights.html.

Academic Honesty and Conduct

Rush University students and faculty belong to an academic community with high scholarly standards. As essential as academic honesty is to the relationship of trust fundamental to the educational process, academic dishonesty violates one of the most basic ethical principles of an academic community, and will result in sanctions imposed under the University's disciplinary system.

Students will be held responsible for adhering to the policy on student academic honesty and conduct as stated in the RUCatalog. Academic dishonesty will result in sanctions imposed under the University's disciplinary system. Disciplinary actions range from warning, probation, suspension or expulsion from the University/Medical Center.

Additional information on Academic Honesty and Conduct can be found at:
https://www.rushu.rush.edu/catalog/acadresources/academichonesty.html

Intellectual properties protection

A core mission of Rush is to improve the public health. For this reason, Rush University Medical Center ("Medical Center") supports the research efforts of its faculty, staff, employees and students (collectively "Covered Individuals‖). One way this is accomplished is by seeking patent protection for new technologies so they can be transferred to the private sector through licensing for further development, commercialization and distribution to the public.

All materials contained within this syllabus, course and course materials, whether in written form or presented any electronic transmission medium; represent the intellectual property of faculty or Rush University Medical Center. Students are prohibited from sharing or transmitting content or materials through any media without express consent or permission of the copyright holder. All rights reserved. Copyright (Rush University Medical Center (or faculty) and year).

Additional information on Intellectual Properties protection can be found at:
https://www.rushu.rush.edu/servlet/BlobServer?blobcol=urlfile&blobtable=document&blobkey=id&blobwhere=1284398791946&blobheader=application%2Fpdf&blobnocache=true

FERPA

Rush University takes seriously its commitment to protect the privacy of our students and their education records. In addition to upholding the Family Educational Rights and Privacy Act of 1974 (FERPA), Rush University has taken further steps to protect a person's privacy by extending similar benefits afforded to enrolled students under FERPA to individuals who are applying for admission. If a specific privacy/confidentiality question is not answered in this text, please contact the Office of the Registrar.

Nothing in this policy may be construed to prohibit the University from disclosing information provided to the institution under the Violent Crime Control and Law Enforcement Act concerning sex offenders who are required to register.

Additional information on FERPA can be found at:
http://www.rushu.rush.edu/servlet/Satellite?MetaAttrName=meta_services&ParentId=1320160786561&ParentType=RushUnivLevel2Page&c=content_block&cid=1320160786609&level1-p=2&level1-pp=1204497836743&level1-ppp=1204497836743&pagename=Rush%2Fcontent_block%2FContentBlockDetail&rendermode=previewnoinsite

HIPPA, Access, Use and Disclosure
N/A

Course Schedule and program

STRUCTURE AND FUNCTION OF BIOMOLECULES, ENERGY GENERATION & METABOLISM, MEMBRANE TRANSPORT & INTRACELLULAR SIGNALING

COURSE DIRECTOR: Dr. Gabriella Cs-Szabo
438 AAC; 312-942-2255
Gabriella_Cs-Szabo@rush.edu

Class meets on: **Mondays, Tuesdays or Thursdays** between **1:00 - 3:30 P.M.**
Course Credit: 2 Semester hours

Room in 540 AAC		**Instructor**
Week 1		
Th Oct 19	Overview of the course Hierarchical structure of proteins (self-study) Protein folding; Post-translational modifications and degradation of proteins. **Relationship to disease/Case Study**	**G Cs-Szabo** **T Schmid**
Week 2		
Mo Oct 23	Enzymes: Proteins as biocatalysts, kinetics and regulation; the role of hormones **Relationship to disease/Case Study**	**T Schmid**
Tue Oct 24	Overview of receptors and pathways Receptors: families and subtypes; receptor-ligand interactions; receptor regulation Receptor integration, strategies for inhibition (include Ca^{2+})	**C Forsyth**
Week 3		
	Quiz #1	
Mo Oct 30	G-protein-coupled receptors: structure, activity, signaling events, effectors and regulation. **Relationship to disease/Case Study**	**C Forsyth**
Tue Oct 31	Cytokine receptors, receptor tyrosine kinases, MAP kinases, NF-κB **Relationship to disease/Case Study**	**C Forsyth**
Week 4		
Mo Nov 6	Nuclear receptors **Relationship to disease/Case Study**	**S Predescu**
Tue Nov 7	Digestion and absorption of food stuff; Generation of cellular energy; common pathways; **Relationship to disease/Case Study**	**G Cs-Szabo**
Week 5		
Mo Nov 13	Hormonal regulation of metabolism **Relationship to disease/Case Study**	**D. Morgan**
Tue Nov 14	Review/Reading day	**Tutors**

Th Nov 16 Midterm Exam 1:00-4:30PM

Week 7

Tue Nov 28	Carbohydrates: Structure and Function, metabolism	**G Cs-Szabo**
Th Nov 30	Carbohydrate metabolism; **Relationship to disease/Case Study**	**G Cs-Szabo**

Week 8

Mo Dec 4	Lipid classes and functions, lipid metabolism	**G Cs-Szabo**
Tue Dec 5	**Quiz #2** Lipid metabolism/cholesterol; **Relationship to disease/Case Study**	**G Cs-Szabo**
Th Dec 7	Amino acid metabolism, bioactive products **Relationship to disease/Case Study**	**T Schmid**

Week 9

Mo Dec 11	Integration of metabolism; **Relationship to disease/Case Study**	
Tue Dec 12	Review/Reading day	**Tutors**

Fr Dec 15 Final Exam 1:00-4:30PM

RUSH UNIVERSITY

Course Syllabus: GCC 503 Cellular Biochemistry Fall, 2017

Course Number	**GCC 503**
Credit Hours	1 semester hours
Course Name	Functional Cell Biology
Term and Year	2017-2018
Day and Time	Class meets on: Mondays through Fridays from 1 PM – 3:00 PM unless specifically instructed to avoid the overlaps with GCC classes.
Format and Location	Class meets on: Monday, Tuesday, Thursday and Friday between 1:00 to 3:00 PM Room AAC 540 for Lectures, Quiz and for Final Exam. The classes will be conducted as face-to-face classes. During the lecture, teaching faculties and students will have intellectual exchanges through topic-related questions and answers.
Course Faculty	Jitesh Pratap, PhD
Faculty e-mail Addresses	jitesh_pratap@rush.edu
Office Location	Jelke Building 1409B
Office Hours	9 AM – 6 PM

Course Description	**Course description:** This course covers the basic elements of the relationship of cells to each other and to their surrounding matrix. General Objectives for the course: 1. To understand the principles of functional cell biology as relate to the manner which describes what is needed in order for cells comprise a tissue. 2. To understand the morphology and function of individual components of cells necessary for their individual functions.
Course Objectives	Within this course it is expected that the student will be able to attain the knowledge to demonstrate: • Compartments and organelles within the typical eukaryotic cell and the function • Introduction of Immune cell. • Cytoskeletal components and how they interact. • How cells are held together to form tissues (integrating cells into tissues). • The components of the extracellular matrix and how it interacts with cells. • The constituents of cells to allow them to communicate with each other and with the matrix around them. • Cell proliferation and apoptosis. • Cellular mitogenesis and cell cycle • Introduction to stem cells. • The mechanisms of cell motility, inflammation and metastasis. • How intracellular and extracellular components travel through cells. • Membrane transport.
Prerequisites	N/A
Required Textbooks	Instructed by Individual Teaching Faculty
Recommended Textbooks	The textbook for this course is *Molecular Cell Biology* (8th Edition) by Lodish, Berk, Kaiser, Krieger, Bretscher, Ploegh, Amon, Martin (2016).

Recommended Web sites	Instructed by Individual Teaching Faculty
Required Software	**Productivity Software (Microsoft Office Suite: Word, Excel, and PowerPoint)** All assignments must be submitted as a Microsoft Office Document. If you do not already have the Microsoft Office software, or a compatible product, Rush students can download the Microsoft Office suite for free for PC or MAC users: *https://rush.onthehub.com/WebStore/ProductsByMajorVersionList.aspx?cmi_mnuMain=2ce0b12b-bb38-dd11-abb7-0030485a6b08* **Internet Browsers** Make sure that you use Google Chrome (most recommended), Mozilla Firefox, or Safari (Mac users) as your browser. DO NOT use Internet Explorer. The links to obtain the Chrome and Mozilla browsers are below. Google Chrome for PC and Mac users: *https://support.google.com/chrome/answer/95346?hl=en* Mozilla Firefox for PC and Mac users: *https://www.mozilla.org/en-US/firefox/new/?utm_source=getfirefox-com&utm_medium=referral#download-fx* **Adobe Reader** Update your Adobe Reader software. **Adobe Flash Player** Update your Adobe Flash software. Download for PC and Mac users: *http://get.adobe.com/flashplayer/otherversions/* **MyRushPC** (myrushpc.rush.edu) Students who do not have required software may choose to use Rush's virtual computing environment to access a virtual computer that enables this access.
Internet Requirements	Students must have high-speed internet access to complete this course. A minimum download speed of 1.5 Mbps is required, which is commonly the speed associated with a basic DSL or a cellular/satellite connection. A faster connection, such as cable or fiber service, will further enhance your online experience.
Computer Requirements	The computer can be a PC or Mac product that meet the following specifications: For PCs • Processor: Intel Core 2 Duo • RAM: 4GB • Hard Drive: 4GB or higher • Operating System: Windows 7, 8, or 10 • Video card with 1024x768 resolution or higher, 16 bit • Webcam of any type • Sound card-any type • Microphone input and speakers • Network hardware of 10/100Mbps Ethernet • Wireless of 802.11g For Macs: • Processor: Intel Core 2 Duo • RAM: 4GB • Hard Drive: 4GB or higher • Operating System: 10.7 or better • Video card with 256 MB dedicated to video memory

	• Webcam of any type • Sound card of any type • Microphone input and speakers • Network hardware of 10/100/1000 or Gigabit Mbps Ethernet • Wireless of 802.11g

ASSESSMENTS and GRADES

Course Assignments and Exams	No Course Assignment is required.
Assignment Submission	No Course Assignment is required.
Late Assignments	No Course Assignment is required.
Exams	There are 2 exams in this course: Quiz and the Final Examination. The exam question format will include multiple-choice or true/false for Quiz and short answer or essay types of questions for the final exam. Students will have three hours (1:00 to 4:00 PM) to complete the exams.
Late Exams	N/A
Course Grading Scale	Grades will be determined from the score of the Quiz (30%) described below and of the Final Examination (70%). Quiz will be administered at the beginning of the session on November 9th at 1:00 pm. It will consist of multiple choice and True/False, and will be counted for 30% of the final grade. The Final Examination may be a combination of the following: Essay Short answer The final exam will contribute 70% to the final grade. The grading scale for the course is as follows: 85.5 – 100 = A 70 – 85.4 = B 55 – 69.9 = C Below 55 = F
Assignment and Exam Due Dates and Credit	The due dates and allocation of credit for the exams and assignments are listed in the schedule below. Please note that all times are Central Time.

Activity	Percentage of Final Grade	Due Date and Time (Central Time)
Quiz	30%	Start: 11-09-17 at 1 pm End: 11-09-17 at 2 pm
Final Exam	70%	Start: 11-27-17 at 1 pm End: 11-27-17 at 4 pm

Timeline for Returning Graded Assignments	N/A

Attendance	Attendance at lecture is not mandatory, however, if the student is not present at lecture that student must follow the lecture notes on his/her own. Attendance at the Quiz and Examination is mandatory. There will be no make-up examinations. If a student is ill on the day of the examination and must miss the quiz/examination, a physician's letter (on letterhead and with the physicians contact information) is required for a replacement examination to be taken. The replacement examination will not be the same examination that the class took and will consist entirely of essay questions. This replacement examination must be taken sometime prior to the end of the next quarter.
Make-Up Policy	According to GCC guidelines, there is no make-up examination offered to raise the grade from B to A or from C to B. If a student fails GCC 503 with a grad of F, the student may be given a makeup examination covering the entire course material if permitted by the Dean of the College, institutional policies and mandates. NOTE: To do well in this course, it is advised that the student attend lectures and read the assigned text book when a topic is not well understood by the student. A strong knowledge of the class notes is imperative.

COURSE COMMUNICATION	
Course Communication	We encourage students to contact faculty with any questions about the course, the content, the assignments (if any), or the exams. Please use the course Discussion Board to ask questions about the course content or assignments. These questions and their answers help everyone better understand the content and help create a learning community. However, please feel free to contact us privately by email if you have questions of a personal nature or need to speak with us privately. **COURSE DIRECTOR:** Dr. Jitesh Pratap (Jelke Building, Room 1409B, 312-563-4633, jitesh_pratap@rush.edu) **Teaching Faculties and Contacts** Dr. Kristin J Al-Ghoul Kristin_J_Al-Ghoul@rush.edu Dr. Sanda Predescu Sanda_Predescu@rush.edu Dr. Paul Carvey Paul_Carvey@rush.edu
Speed of Answering Questions	Questions posted in the course on weekdays, will usually be answered within 24 hours. Questions posted in the course on the weekend, will usually be answered within 48 hours.
Expectations for professional behavior	All students are expected to: 1. Show respect for other students and the instructors in the class. 2. Be sensitive to the fact that there will be cultural and linguistic backgrounds, as well as different political and religious beliefs. 3. Express differences of opinion in a polite and rational way. 4. Maintain an environment of constructive criticism when commenting on the work of other students or the course. 5. Respect the privacy of other students. 6. Use good grammar and spelling. 7. Use salutations and titles in your messages. Formal titles (Dear Dr. Smith, Dear Professor, Dear Classmates) are always acceptable. It is also

	appropriate to end you note with a closing, with a closing (Thank you, Sincerely, Respectfully) when emailing students or faculty. 8. Be sure to say please and thank you. 9. Send only one message about a topic and wait for an answer. Write your messages in formal language using sentences, capitalization, punctuation, and appropriate grammar.

RESOURCES and SUPPORT	
Resources for Technology Problems	If you need help with BlackBoard, call the BlackBoard Help line at 312-563-CLAS, option 2. The BlackBoard help line is available 24/7/365. If you need help with access to your Rush computer account or software, call the Rush University Help desk at 312-563-CLAS, option 4.
Student Counseling Services	The transition to graduate school can be stressful. If you ever feel overwhelmed, please don't hesitate to make use the Rush student counseling services. Rush has outstanding services and all services are completely confidential. Here are the numbers to call for an appointment: Local students: 312-942-3687 Distance students: 800-292-2780

STRATEGIES FOR SUCCESS

Below are some strategies that will help you be successful in this course.

- Print the course syllabus and schedule. Post the course schedule in your study space and put the due dates in your personal calendar. Check the schedule at least once a week to make sure that you know what is due that week.
- Use the course calendar in BlackBoard. You can integrate the calendars from all of your classes into a single calendar. You can also 'push' the course calendar into your personal calendar on your phone or digital tablet.
- Be sure to check the course at least 3 times a week. Each time, check the Discussion Board, Course Email, and Course Calendar.
- Print the weekly modules. Focus your studying on the learning objectives listed in the modules. These objectives specify what knowledge and skills must be learned that week, and the assignments and exam questions are based on those objectives. When you study for the exams, make sure that you can answer each of the objectives and state the answer out loud.
- Once the assignments are graded, you can review the correct answers and any instructor comments
- Attend the online classes or watch the mp4 recordings of the classes. The recordings are usually available about 24 hours after the live class. A printable version of the PowerPoint slides used in the class will be provided before the class starts.
- Use the course discussion board to ask questions related to the course content and assignments.
- Use the course email for personal questions. The course email system is located in the BlackBoard course.

- Contact the course director as soon as possible if you are having difficulties with the course or personal issues that may affect your performance in the course.
- Keep up with the course. If you follow the instructions for each week of the course, you will find that you are ready for the assignments and exams, course calendar, and the weekly modules.
- When completing your assignments, please write your answers in complete sentences using appropriate grammar, spelling, and punctuation.
- Complete your assignments and submit them before the deadline. The due dates for all assignments are listed in the course syllabus. Assignments are always due by 11 pm Central Time. Late assignments receive a 20% deduction in points.
- Exams must be completed and submitted by the deadline for submission. Late exams cannot be accepted.
- Finally, in all situations, please adhere to the Rush Honor Code. This is an essential part of your personal and professional integrity.

UNIVERSITY POLICIES

Honor Code and Academic Honesty	Students are expected to abide by the Rush Honor Code relating to academic integrity throughout all aspects of this course, including all assignments and exams. As trusted health care professionals, we take the issue of academic integrity very seriously and expect that you will adhere to the highest standards of integrity at all times. Rush University students and faculty belong to an academic community with high scholarly standards. As essential as academic honesty is to the relationship of trust fundamental to the educational process, academic dishonesty violates one of the most basic ethical principles of an academic community, and will result in sanctions imposed under the University's disciplinary system. A partial list of academically dishonest behaviors that would subject a student to disciplinary action includes: • *Cheating*: Using unauthorized material or unauthorized help from another person in any work submitted for academic credit. • *Fabrication*: Inventing information or citations in an academic or clinical exercise. • *Facilitating Academic Dishonesty*: Providing unauthorized material or information to another person. • *Plagiarism*: Submitting the work of another person or persons, as one's own without acknowledging the correct source. • *Unauthorized Examination Behavior*: Conversing with another person, passing or receiving material to/from another person or temporarily leaving an examination site to visit an unauthorized site.
Intellectual Properties Protection	All materials contained within this syllabus, course and course materials, whether in written form or presented through video or audio transmission, represent the intellectual property of faculty or Rush University Medical Center. Students are prohibited from sharing or transmitting content or materials through any media without express consent or permission of the copyright holder.
Academic Policies	Each student is responsible for following all Rush University and College of Nursing policies. Once you have logged into the Portal it should take you to the College of Nursing page. You will find the Handbook link on that page. Please

	pay particular attention to Section 4: Policies and Procedures.
Disability Accommodations	In keeping with its goal to promote diversity among its student population, Rush University is committed to attracting and educating students who will help to make the population of health care professionals representative of the national population, including students with disabilities. In addition, Rush University wishes to insure that access to its facilities, programs and services are available to students with disabilities. The University provides reasonable accommodations to all students on a nondiscriminatory basis consistent with legal requirements as outlined in the Americans with Disabilities Act (ADA) of 1990 and the Rehabilitation Act of 1973. A reasonable accommodation is a modification or adjustment to an instructional activity, facility, program or service that enables a qualified student with a disability to have an equal opportunity to participate in all Rush University student activities. To be eligible for accommodations, a student must have a documented disability as defined by the ADA and Section 504 of the Rehabilitation Act of 1973. Both the ADA and Section 504 define disability as (a) a physical or mental impairment that substantially limits one or more major life activities of such individual; (b) a record of such impairment; or (c) being regarded as having such a condition. *Please note that students with a documented need for accommodations should notify each of their course instructors during the first week of the class.* Students will need to show the Course Director their official notice of approval for accommodations and the type of accommodations needed.

GCC 503: FUNCTIONAL CELL BIOLOGY
Course Schedule – October 20 – November 27, 2017

DATES	Learning Objectives and Learning Activities (1:00 to 3:00 PM)	
Room	**AAC 540**	
(1) Friday, Oct 20	INTRODUCTION Cellular Compartments and Function, Cell Signaling, Introduction of Immune Cell	**Dr. Jitesh Pratap**
(2) Thursday, Oct 26	Introduction to the Cytoskeleton Cellular function and associated human diseases	**Dr. K. Al-Ghoul**
(3) Friday, Oct 27	Introduction to the Extracellular Matrix and its clinical aspects	**Dr. K. Al-Ghoul**
(4) Thursday, Nov 2	Dynamics of Integrating Cells into Tissues: Cell-cell Adhesion, Gap Junctions, Cell-ECM adhesion, and its clinical aspect	**Dr. K. Al-Ghoul**
(5) Friday, Nov 3	Cell cycle, Cell proliferation, Apoptosis	**Dr. Sanda Predescu**
(6) Thursday, Nov 9	**Quiz on material up to this point,** followed by lecture. Stem Cells: Principle and Clinical Application	**Dr. Jitesh Pratap**
(7) Friday, Nov10	Cell Motility/ Inflammation/Metastasis	**Dr. Jitesh Pratap**
(8) Friday, Nov 17	Exocytosis and Membrane Fusion and Vesicular Traffic	**Dr. Sanda Predescu**
(9) Monday, Nov 20	Membrane Transport (Carrier proteins and active membrane transport, ion channels and electrical properties of membranes)	**Dr. P. Carvey**
(10) Tuesday, Nov 21	Review/Reading day Ricardo Perez Ricardo_Perez@rush.edu	
(11) Monday, Nov 27	**Final Examination** 1:00-4:00 PM (Room AAC 711/712)	

BTN 523 Tools For Research **Fall 2017**

Instructor Name	Bill Hendey PhD
Email	bill_hendey@rush.edu
Work Phone	
Fax	
Preferred Method of Contact	**email**
Office Hours: upon request	
Credit Hours	**1**

Course Purpose/Description

This course focuses on computer skills necessary to work as a scientist with the emphasis on data presentation and communication.

Course content
Overview:
It includes didactic lecture and computer practice. We begin by discussing and demonstrating search strategies for scientific literature using pubmed. Students will learn how to organize import and format references in scientific papers. Data presentation is covered using Excel and Sigma Plot. Students also learn how to combine, enhance and annotate microscope images using Photoshop. Data presentation in PowerPoint slide shows is discussed. Finally, importing charts and images into Word is covered with an emphasis on image/graph layout skills necessary for grant proposals. There is also a class devoted to searching Grants.gov for grant information.

Meeting Days and Times *(table)*

See table on last page

Required Text(s) *(full citation)*

None

Recommended Text(s) *(full citation)*

None.

Required Equipment/Uniforms

N/A

Software *(full citation)*

Computers with all the appropriate software are provided in class.

Pre-requisites (courses, achieved competencies)

None

Course Learning Objectives

Upon completion of the course, the student will be able to:

1. Search the literature for a specific reference(s) or topic
2. Utilize a Bibliography program to catalog and organize references
3. Add and change reference formatting in a scientific paper/grant
4. Utilize Excel to summarize data from multiple experiments and to provide a way to standardize calculations for experimental procedures
5. Utilize Excel and other programs for charts
6. Use Photoshop to merge and annotate scientific micrograph.
7. Use Word to modify a grant proposal including changing reference formatting and insertion and lay out of graphs and figures.
8. Use NIH.gov to find grant information and tools.

Proctored Assessment(s) *(as applicable)*

Submission of projects via Blackboard

Attendance

See below

Late Work

Requires permission

Evaluation

Grades will be based on the completion of several projects. The projects are cumulative so don't put them off. The course notes can be found on Blackboard along with the information necessary for the projects.

A= 85%–100%

B = 75%–84%

C= 60%–74%

F= < 59%

Course communication, expectations, and etiquette

This is a "hands on" course. Students are expected to follow the instructor's demonstration. Attendance at the lectures is the best way to assure that you have access to the software and know how to do the work. Lectures are tailored to allow for questions and have natural break points built in for individual help. This is done to assure that everyone is on the same page. Please be respectful of the other students. The class should be a collaborative experience and I encourage you to help others while I am providing help to other students.

If you attend and do not do the work you are wasting your time and likely distracting the class. Anyone not preforming the assignment and distracting others will be asked to leave.

RUSH Rush is a not-for-profit health care, education and research enterprise comprising Rush University Medical Center, Rush University, Rush Oak Park Hospital and Rush Health.
© 2012 Rush University Medical Center

The course notes are online on blackboard. If you have the necessary software for a particular lecture, you may do the work at home and submit your projects via blackboard. Most students do not have Sigma Plot and Photoshop software and are unfamiliar with it. It is recommended that all students attend these lectures. However, both Sigmaplot and Photoshop are available in the METC 903 during or outside of class hours, so it is possible to use these programs without attending the lectures. (Other classes use the METC so they are not available to you during the times of the other classes-See schedule posted on the door, please do not disrupt other classes using the METC)

Projects: All projects are directly related to the lectures and instructions are on blackboard. Some of the projects will require you to use the class work material. Save the files to a Flash Drive or email them to yourself so you don't have to repeat the work.

Disability Accommodations

Rush University wishes to ensure that access to its facilities, programs and services are available to students with disabilities. The University provides reasonable accommodations to all students on a non-discriminatory basis consistent with legal requirements as outlined in the Americans with Disabilities Act (ADA) of 1990 and the Rehabilitation Act of 1973 and applicable implementing regulations of these statutes. A reasonable accommodation is a modification or adjustment to an instructional activity, facility, program or service that enables a qualified student with a disability to have an equal opportunity to participate in all Rush University student activities.

Additional information on disability accommodations and programs can be found at: http://www.rushu.rush.edu/catalog/aboutrush/disabilityrights.html.

Academic Honesty and Conduct

Rush University students and faculty belong to an academic community with high scholarly standards. As essential as academic honesty is to the relationship of trust fundamental to the educational process, academic dishonesty violates one of the most basic ethical principles of an academic community, and will result in sanctions imposed under the University's disciplinary system.

Students will be held responsible for adhering to the policy on student academic honesty and conduct as stated in the RUCatalog. Academic dishonesty will result in sanctions imposed under the University's disciplinary system. Disciplinary actions range from warning, probation, suspension or expulsion from the University/Medical Center.

Additional information on Academic Honesty and Conduct can be found at:

© 2012 Rush University Medical Center

https://www.rushu.rush.edu/catalog/acadresources/academichonesty.html

Intellectual properties protection

A core mission of Rush is to improve the public health. For this reason, Rush University Medical Center ("Medical Center") supports the research efforts of its faculty, staff, employees and students (collectively "Covered Individuals ‖). One way this is accomplished is by seeking patent protection for new technologies so they can be transferred to the private sector through licensing for further development, commercialization and distribution to the public.

All materials contained within this syllabus, course and course materials, whether in written form or presented any electronic transmission medium, represent the intellectual property of faculty or Rush University Medical Center. Students are prohibited from sharing or transmitting content or materials through any media without express consent or permission of the copyright holder. All rights reserved. Copyright (Rush University Medical Center (or faculty) and year).

Additional information on Intellectual Properties protection can be found at: https://www.rushu.rush.edu/servlet/BlobServer?blobcol=urlfile&blobtable=document&blobkey=id&blobwhere=1284398791946&blobheader=application%2Fpdf&blobnocache=true

FERPA

Rush University takes seriously its commitment to protect the privacy of our students and their education records. In addition to upholding the Family Educational Rights and Privacy Act of 1974 (FERPA), Rush University has taken further steps to protect a person's privacy by extending similar benefits afforded to enrolled students under FERPA to individuals who are applying for admission. If a specific privacy/confidentiality question is not answered in this text, please contact the Office of the Registrar.

Nothing in this policy may be construed to prohibit the University from disclosing information provided to the institution under the Violent Crime Control and Law Enforcement Act concerning sex offenders who are required to register.

Additional information on FERPA can be found at:

© 2012 Rush University Medical Center

http://www.rushu.rush.edu/servlet/Satellite?MetaAttrName=meta_services&ParentId=1320160786561&ParentType=RushUnivLevel2Page&c=content_block&cid=1320160786609&level1-p=2&level1-pp=1204497836743&level1-ppp=1204497836743&pagename=Rush%2Fcontent_block%2FContentBlockDetail&rendermode=previewnoinsite

RUSH Rush is a not-for-profit health care, education and research enterprise comprising Rush University Medical Center, Rush University, Rush Oak Park Hospital and Rush Health.
© 2012 Rush University Medical Center

Course Schedule and program

Important Note: Changes may occur to the syllabus at the instructor's discretion. When changes are made, students will be notified via an announcement.

Course content/schedule:

Date	Room	Time *	Topic/Program
9/05	903	TUE 3:30-6:00*	Pubmed/Browser
9/12	903	TUE 3:30-6:00*	Bibliography/Refworks-Endnote
9/26	903	TUE 3:30-6:00*	Data-charting/Excel
10/03		Online lecture	Powerpoint
10/10	903	TUE 3:30-6:00*	Standard Curve/Excel
10/16	903	**Mon** 3:30-6:00*	Charting/SigmaPlot
10/24	903	TUE 3:30-6:00*	Ethics of Photoshop
10/31	903	TUE 3:30-6:00*	Images/Photoshop
11/07	903	TUE 3:30-6:00*	Images/Photoshop
11/14	**903**	TUE 3:30-6:00*	Images/Photoshop
11/21	903	TUE 3:30-6:00*	Grant submission process NIH website
11/28	903	TUE 3:30-6:00*	Importing images and layout in Word
12/05	903	TUE 3:30-6:00*	Project critiques
12/12	903	TBD	Consultation/Projects due

***Time varies with section:**
3:30-4:30 BTN Section 1
4:30-5:30 IBS Section 2
5:30 to 6:00 is a help session open to both classes.

RUSH Rush is a not-for-profit health care, education and research enterprise comprising Rush University Medical Center, Rush University, Rush Oak Park Hospital and Rush Health.
© 2012 Rush University Medical Center

RUSH UNIVERSITY

Course Syllabus: BTN 525 Experimental Design and Models of Disease **Fall 2017**

Instructor Name Paul M. Carvey, PhD

Email
Paul_Carvey@rush.edu

Work Phone

Fax

Preferred Method of Contact Email Paul_Carvey@rush.edu

Office Hours: By appointment

Credit Hours 2

Course Purpose/Description To familiarize students with the nuts and bolts of designing experiments.

Course Type & Format *Lecture Discussion on Campus*

Meeting Days and Times *(table)*

Week	Date	Day of Week	Topic	Instructor		Room
1	9-6	Wed	Intro to design	Carvey	1-3	AAC539
2	9-13	Wed	Experimental Planning	Carvey	1-3	AAC539
3	9-15	Friday	Statistical approach to design	Carvey	10-12	AAC539
4	9-18	Monday	Controls and Design	Carvey	3:30-5:30	AAC539
5-6	9-25/28 **Sec 2**	Mon/Thur	Factorial designs/Clinical Designs	Carvey	9-12	AAC1046
5-6	9-27/29 **Sec 1**	Wed/Fri	Factorial designs/Clinical Designs	Carvey	1-3/3:30-5:30	AAC971
7	10-3 **Sec 2**	Tuesday	Error/Power/Blocking	Carvey	3-5	AAC1046
7	10-4 **Sec 1**	Wed	Error/Power/Blocking	Carvey	1-3	AAC971
8	10-9 **Both Sec**	Monday	Exam	Carvey	9-12	AAC540
9	10-11 **Sec 1**	Wed	Model Systems	Carvey	1-3	AAC971
9	10-13 **Sec 2**	Fri	Model Systems	Carvey	10-12	AAC971
10	10-25 **Sec 1**	Wed	Vertebrates/Complex behavior	Carvey	1-3	AAC950
10	10-27 **Sec 2**	Fri	Vertebrates/Complex behavior	Carvey	10-12	AAC971
11	11-1 **Sec 1**	Wed	Invertebrate Models	Carvey	1-3	AAC950
11	11-3 **Sec 2**	Fri	Invertebrate Models	Carvey	10-12	AAC1046
12	11-8 **Sec 1**	Wed	Culture systems and bacteria	Carvey	1-3	AAC950
12	11-10 **Sec 2**	Fri	Culture systems and bacteria	Carvey	10-12	AAC971
13	12-6 **Both Sec**	Wed	Exam	Carvey	1-4	AAC539
15	12-19/20	Tues/Wed	Presentations	Carvey	9-12/1-5	AAC539

Required Text(s) *(full citation) None*

Recommended Text(s) *(full citation)* None

Required Equipment/Uniforms None

Software *(full citation) None*

Pre-requisites (courses, achieved competencies) None

Course Learning Objectives
At the end of this course, the student should be able to:

1. Use the language of experimental design in a coherent fashion.
2. Use the threats to internal and external validity and apply them to a design to improve it.
3. Differentiate the various design types and be able to identify the design that best tests a question raised.
4. Identify what a true control is and add them appropriately to a design.
5. Relate to the ethical issues of animal model research and defend either a pro-animal or anti-animal stance on animal research.
6. Choose the appropriate animal for a research design and test it using various established methods.

Exam or Proctored Assessment(s) *(as applicable)*
Mid-term and Final Exam; Term Paper and Presentation

Attendance Attendance is required.

Late Work Expected to submit all assignments on time as specified by the Course Director or _Lose 5 points/day_____

Learning Groups *(as applicable)* Students will work independently or with another student for the presentation and term paper

Evaluation
The student's final grade will be determined as follows:

Mid-term	25%
Final	40%
Term Paper	20%
Presentation	15%

Total Points: 100 pts

RUSH Rush is a not-for-profit health care, education and research enterprise comprising Rush University Medical Center, Rush University, Rush Oak Park Hospital and Rush Health.
© 2012 Rush University Medical Center

Grading Scale

A= 85%–100%
B= 70%–84.9%
C= 55%–69.9%
F=<55

Course communication, expectations, and etiquette

The purpose of this course is to provide the student with a clear understanding of how to design an experiment, control it properly, power it properly, understand threats to validity, use an appropriate design type, understand model systems and their limitations, understand how to study complex concepts such as behavior, understand the use of invertebrates in model systems, and understand culture designs and bacterial studies. The student will also be able to take a question, research it, identify a gap in the field, design an experiment to fill that gap, and generate mock data to proof the design. The student will be able to write the project up and then present it to the class.

Email use….
Blackboard will be used extensively

Discussion use….

The material is best learned by active participation in the class. Dr. Carvey will present a question (e.g., do blondes have more fun?) and will then turn to the students to design a study to test the question. This generally occupies 50% of a class followed by lecture material that will be covered in the next session where another question will be posed.

Disability Accommodations

Rush University wishes to ensure that access to its facilities, programs and services are available to students with disabilities. The University provides reasonable accommodations to all students on a non-discriminatory basis consistent with legal requirements as outlined in the Americans with Disabilities Act (ADA) of 1990 and the Rehabilitation Act of 1973 and applicable implementing regulations of these statutes. A reasonable accommodation is a modification or adjustment to an instructional activity, facility, program or service that enables a qualified student with a disability to have an equal opportunity to participate in all Rush University student activities.

Additional information on disability accommodations and programs can be found at: http://www.rushu.rush.edu/catalog/aboutrush/disabilityrights.html.

Academic Honesty and Conduct

Rush University students and faculty belong to an academic community with high scholarly standards. As essential as academic honesty is to the relationship of trust fundamental to the educational process, academic dishonesty violates one of the most basic ethical principles of an

© 2012 Rush University Medical Center

academic community, and will result in sanctions imposed under the University's disciplinary system.

Students will be held responsible for adhering to the policy on student academic honesty and conduct as stated in the RUCatalog. Academic dishonesty will result in sanctions imposed under the University's disciplinary system. Disciplinary actions range from warning, probation, suspension or expulsion from the University/Medical Center.

Additional information on Academic Honesty and Conduct can be found at:
https://www.rushu.rush.edu/catalog/acadresources/academichonesty.html

Intellectual properties protection

A core mission of Rush is to improve the public health. For this reason, Rush University Medical Center ("Medical Center") supports the research efforts of its faculty, staff, employees and students (collectively "Covered Individuals). One way this is accomplished is by seeking patent protection for new technologies so they can be transferred to the private sector through licensing for further development, commercialization and distribution to the public.

All materials contained within this syllabus, course and course materials, whether in written form or presented any electronic transmission medium, represent the intellectual property of faculty or Rush University Medical Center. Students are prohibited from sharing or transmitting content or materials through any media without express consent or permission of the copyright holder. All rights reserved. Copyright (Rush University Medical Center (or faculty) and year).

Additional information on Intellectual Properties protection can be found at:
https://www.rushu.rush.edu/servlet/BlobServer?blobcol=urlfile&blobtable=document&blobkey=id&blobwhere=1284398791946&blobheader=application%2Fpdf&blobnocache=true

FERPA

Rush University takes seriously its commitment to protect the privacy of our students and their education records. In addition to upholding the Family Educational Rights and Privacy Act of 1974 (FERPA), Rush University has taken further steps to protect a person's privacy by extending similar benefits afforded to enrolled students under FERPA to individuals who are applying for admission. If a specific privacy/confidentiality question is not answered in this text, please contact the Office of the Registrar.

Nothing in this policy may be construed to prohibit the University from disclosing information provided to the institution under the Violent Crime Control and Law Enforcement Act concerning sex offenders who are required to register.

Additional information on FERPA can be found at:
http://www.rushu.rush.edu/servlet/Satellite?MetaAttrName=meta_services&ParentId=1320160786561&ParentType=RushUnivLevel2Page&c=content_block&cid=1320160786609&level1-

© 2012 Rush University Medical Center

p=2&level1-pp=1204497836743&level1-ppp=1204497836743&pagename=Rush%2Fcontent_block%2FContentBlockDetail&rendermode=previewnoinsite

HIPPA, Access, Use and Disclosure
TBD

RUSH Rush is a not-for-profit health care, education and research enterprise comprising Rush University Medical Center, Rush University, Rush Oak Park Hospital and Rush Health.
© 2012 Rush University Medical Center

Course Schedule and program

Important Note: Changes may occur to the syllabus at the instructor's discretion. When changes are made, students will be notified via an announcement.

Basic Mechanics of Materials applied to Musculoskeletal system Dr. Raghu N Natarajan

1. Static analyses, Newton's first law, area moment of inertia, bending of beams, torsion, contact forces (2 Lectures)
2. Loads in musculoskeletal system (1 Lecture)
3. Newton's second law of motion, Impulse, Mass Moment of Inertia, Center of mass, impulse moment relationships (1 Lecture)
4. Static and dynamic structural analyses of musculoskeletal systems. (4 Lectures)
5. Bone implant system, implant material (1 Lecture)
6. Basic concept on design of joint replacements—hip knee, shoulder and spine. (2 Lectures)

Tissue Properties and Characterization – Dr. A. Espinoza

1. Characterization of Tissue properties – 1 Lecture
2. Mineralized tissue, cortical and trabecular bone – 1 Lecture
3. Cartilage and Intervertebral Discs – 1 Lecture
4. Muscle, Capsules, Ligaments and Tendon – 1 Lecture

Overview

Session Learning Objectives (performance outcomes/objectives)

After this session, the student will be able to better understand how basic mechanics principles can be used to understand the motion of human joints, how bone and tissues behave from mechanics point of view.

Course Activities [any learning experience where feedback from faculty is NOT provided]

Textbook Reading TBD BY FACULTY

Online Reading TBD BY FACULTY

Discussion Board (as required by course format) Discussion on the on going topic in the class and required by the faculty

Assignments/Assessments [any learning experience where faculty provides any feedback]
Assignments submitted by the students will be evaluated by the faculty and discussed in the following class.

© 2012 Rush University Medical Center

RUSH UNIVERSITY

Course Syllabus: BTN531 Laboratory Techniques I **Fall 2017**

Instructor Name	Thomas Schmid, PhD
Email	Tom_Schmid@rush.edu
Work Phone	312-942-3051
Fax	312-942-3053
Preferred Method of Contact	Email
Office Hours:	by appointment, 524 Cohn.
Credit Hours	**3**

Course Purpose/Description

This is the first course in a series of 6 laboratory courses for biotechnology students. The overall purpose of this biotechnology degree is to train students to become effective laboratory technicians. This course will provide general laboratory safety, chemical safety, and biohazard safety training. The students will learn to perform basic laboratory math calculations for preparation of chemical solutions, dilutions, and data analysis. They will learn how to calibrate, check the calibration, and use some simple laboratory equipment like electronic balances, pH meters, and micropipets. They will learn to make accurate buffers from chemical reagents. They will receive basic training in sterile cell culture techniques. The students will also learn to use the spectrophotometer and perform protein assays.

Course Format *(online, face-to-face, etc.))*

The course is taught by short lectures, group work, and laboratory exercises SOPs. The student should work on the laboratory skill being taught until s/he feels comfortable with the technique. Most of the experiments will be performed in groups of 2 students. Lab partners will be assigned randomly by the course director. Lab partners will be changed about half way through the class. Experiments should be performed equally by both students in each lab group. It is important that all students acquire all technical skills expected in each laboratory exercise (SOPs). Some experiments are performed individually. Part of the laboratory notebook grades for some SOPs will be based on individual practical skill assessments. For laboratory notebook write-ups, a background introduction is provided, as is the methods section. The data is shared between the two students in the group. However each student must analyze their data, answer any questions, and discuss their results individually. Each student in a group will turn in their own notebook for a grade. **Having the same or highly similar results and/or discussion sections by two students will be considered plagiarism.** Some experiments will involve the analysis of the data of the entire class. Groups are not allowed to use other groups' or other students' data unless they receive permission from Dr. Schmid. Success in this course implies that you can work in a laboratory with minimal to no training in these techniques using similar instruments.

Opportunity for additional assistance is available by making an appointment with the Course Director (see Office Hours, above).

Meeting Days and Times *(table)*

Classes will be held from September 5, 2017 through Tuesday October 10, 2017. Class will begin at 8:30AM and finish by 12 noon. Please consult the class schedule for specific days. In general the laboratory classes will be held in AAC722.

Required Text(s) *(full citation)*

None

Recommended Text(s) *(full citation)*

On Reserve in the library:
At the Bench by Kathy Barker, Cold Spring Harbor Press.
Lab Math by Danny Spencer Adams, Cold Spring Harbor Press

Required Equipment/Uniforms

Laboratory coat will be provided.

Software *(full citation)* **None**

Pre-requisites (courses, achieved competencies) None

Course Learning Objectives

The goals of this course are to:

1. Train students in basic laboratory techniques and basic laboratory equipment.
2. To provide extensive practice in basic laboratory mathematics and typical calculations.
3. The students will be knowledgeable about Good Laboratory Practice (GLP), will keep a GLP notebook, and students should become GLP Certified.
4. Students will be able to discuss typical laboratory hazards and basic lab safety.

Proctored Assessment(s) *(as applicable)*

Course director and teaching assistants;
Larry Madsen (Lawrence_Madsen@rush.edu) 312-563-2435
John Gallagher (John_Gallagher@rush.edu) 312-563-2435

Attendance

Attendance is required at all lectures and laboratories. Work can only be made up, if at all, with a ***documented*** personal or family emergency – see **BTN Program Statement of Attendance Policy.**

RUSH Rush is a not-for-profit health care, education and research enterprise comprising Rush University Medical Center, Rush University, Rush Oak Park Hospital and Rush Health.
© 2012 Rush University Medical Center

Late Work

Students are expected to be on time for class. A sign in sheet will be posted before each class period. Students must sign in for each class. At 8:40AM or 10 minutes after the start of class the sign in sheet will be collected. Any student arriving more than 10 minutes late will be considered tardy for that class. Each student will receive one tardy day without penalty, after that one point (5%) will be deducted from the lab grade for that day. Similarly, one point (5%) will be deducted for each day a lab notebook is not turned in on time.

Learning Groups *(as applicable)*

For most experiments student will work in group pairs. In some experiments, especially lab technique practicals, the students will work independently (not in pairs)TBD BY FACULTY

Evaluation

Notebook and performance	300 (15 SOPs, 20 points each)
Exams	120 (3 exams)
GLP Certification Exam	80
Total Points	500

Grading Scale

A = 90-100%
B = 80-89%
C = 70-79%

Course communication, expectations, and etiquette

The purpose of this course is to provide laboratory training for professional researchers. Therefore it is expected that students in this course will strive to exemplify professional behavior. Unprofessional and rude behavior will not be tolerated, and will be penalized by deducting points from laboratory notebooks grades. Some examples of unprofessional and rude behavior are: disrespecting other students, teaching assistants and instructors, using cell phones or notebook computers during class lectures and lab experiments (laboratory notes should be written as raw data in your bound lab notebook), turning your back to a teacher during his or her lecture, sleeping in class, doing other coursework in class.

The purpose of the discussion boards is to allow students to freely exchange ideas. It is imperative to remain respectful of all viewpoints and positions and, when necessary, agree to respectfully disagree. While active and frequent participation is encouraged, cluttering a discussion board with inappropriate, irrelevant, or insignificant material will not earn additional points and may result in receiving less than full credit. Frequency is not unimportant, but content of the message is paramount. Please remember to cite all sources—when relevant—in order to avoid plagiarism.

RUSH Rush is a not-for-profit health care, education and research enterprise comprising Rush University Medical Center, Rush University, Rush Oak Park Hospital and Rush Health.
© 2012 Rush University Medical Center

Disability Accommodations

Rush University wishes to ensure that access to its facilities, programs and services are available to students with disabilities. The University provides reasonable accommodations to all students on a non-discriminatory basis consistent with legal requirements as outlined in the Americans with Disabilities Act (ADA) of 1990 and the Rehabilitation Act of 1973 and applicable implementing regulations of these statutes. A reasonable accommodation is a modification or adjustment to an instructional activity, facility, program or service that enables a qualified student with a disability to have an equal opportunity to participate in all Rush University student activities.

Additional information on disability accommodations and programs can be found at: http://www.rushu.rush.edu/catalog/aboutrush/disabilityrights.html.

Academic Honesty and Conduct

Rush University students and faculty belong to an academic community with high scholarly standards. As essential as academic honesty is to the relationship of trust fundamental to the educational process, academic dishonesty violates one of the most basic ethical principles of an academic community, and will result in sanctions imposed under the University's disciplinary system.

Students will be held responsible for adhering to the policy on student academic honesty and conduct as stated in the RUCatalog. Academic dishonesty will result in sanctions imposed under the University's disciplinary system. Disciplinary actions range from warning, probation, suspension or expulsion from the University/Medical Center.

Additional information on Academic Honesty and Conduct can be found at: https://www.rushu.rush.edu/catalog/acadresources/academichonesty.html

Intellectual properties protection

A core mission of Rush is to improve the public health. For this reason, Rush University Medical Center ("Medical Center") supports the research efforts of its faculty, staff, employees and students (collectively "Covered Individuals ‖). One way this is accomplished is by seeking patent protection for new technologies so they can be transferred to the private sector through licensing for further development, commercialization and distribution to the public.

© 2012 Rush University Medical Center

All materials contained within this syllabus, course and course materials, whether in written form or presented any electronic transmission medium, represent the intellectual property of faculty or Rush University Medical Center. Students are prohibited from sharing or transmitting content or materials through any media without express consent or permission of the copyright holder. All rights reserved. Copyright (Rush University Medical Center (or faculty) and year).

Additional information on Intellectual Properties protection can be found at: https://www.rushu.rush.edu/servlet/BlobServer?blobcol=urlfile&blobtable=document&blobkey=id&blobwhere=1284398791946&blobheader=application%2Fpdf&blobnocache=true

FERPA

Rush University takes seriously its commitment to protect the privacy of our students and their education records. In addition to upholding the Family Educational Rights and Privacy Act of 1974 (FERPA), Rush University has taken further steps to protect a person's privacy by extending similar benefits afforded to enrolled students under FERPA to individuals who are applying for admission. If a specific privacy/confidentiality question is not answered in this text, please contact the Office of the Registrar.

Nothing in this policy may be construed to prohibit the University from disclosing information provided to the institution under the Violent Crime Control and Law Enforcement Act concerning sex offenders who are required to register.

Additional information on FERPA can be found at: http://www.rushu.rush.edu/servlet/Satellite?MetaAttrName=meta_services&ParentId=1320160786561&ParentType=RushUnivLevel2Page&c=content_block&cid=1320160786609&level1-p=2&level1-pp=1204497836743&level1-ppp=1204497836743&pagename=Rush%2Fcontent_block%2FContentBlockDetail&rendermode=previewnoinsite

HIPPA, Access, Use and Disclosure

TBD

Course Schedule and program

© 2012 Rush University Medical Center

Important Note: Changes may occur to the syllabus at the instructor's discretion. When changes are made, students will be notified via an announcement.

Week	Date and Time	Safety Topic	Basic Lab Skill Learned	Experiment/Topic
1	9-5-17 Tue	Safe behavior in the laboratory. DVD: Emergency Response	Micropipette Use Lab book	Introduction to BTN531, What is Biotechnology? Syllabus Review Introduction to GLP, GLP Notebooks-**SOP 1** Using Micropipettes-**SOP 2**
1	9-06-17 Wed	Purpose/Use of MSDSs (lecture, group discussion). DVD: Assessing the Risk of Toxic Chemicals	Micropipette Calibration Solutions and buffers	Laboratory Math – Making solutions and buffers. Calibrating an instrument-**SOP 3, 4 or 5 (*)** pH meter, electronic balance, pipets
1	9-07-17 Thur	Regulations affecting labs. DVD: Chemical Hazards	Electronic Balance Calibration; Use of electronic pipetters	Calibrating an instrument-**SOP 3,4 or 5 (*)** Using electronic pipetters. Calculations practice **QUIZ**
1	9-8-17 Fri	Safety – Biological Safety and Recombinant DNA Oversight DVD: Mammalian Cell Culture Hazards	pH meter calibration, Centrifuge use	Laboratory Math- Stock Solutions The centrifuge: rpm vs xg Calibrating an instrument-**SOP 3, 4, or 5 (*)**
2	9-11-17 Mon	DVD: Centrifugation Hazards; Chemical Storage Hazards	Biological Safety Hood use Plating cells Sterile techniques	How do I make a buffer? **SOP 6**
2	9-12-17 Tues	**DVD:** Glassware Washing Hazards	Using microscopes	Using Microscopes
2	9-13-17 Wed	Scalpel hazards.		Biohazards Microscope practical **SOP 7**
2	9-14-17 Thur		Using a hemacytometer;	Counting Cells with a Hemocytometer – **SOP 8** **Lab book grading** **Exam 1**

RUSH Rush is a not-for-profit health care, education and research enterprise comprising Rush University Medical Center, Rush University, Rush Oak Park Hospital and Rush Health.
© 2012 Rush University Medical Center

3	9-18-17 Mon		Tissue Culture	Cell culture of an immortalized cell line. Effect of %FBS on A549 cell growth – **SOP 9**
3	9-19-17 Tues			**Hoof dissection** Guest instructor – Larry Madson. Tissue culture of articular cartilage-**SOP10** Laboratory Math: making complex solutions.
3	9-20-17 Wed	Golf Outing	Enzymatic digestion of tissue.	Primary cell culture: Pronase and collagenase digestion of cartilage – **SOP 10**.
3	9-21-17 Thur			Plate chondrocytes – **SOP10**. Lab Math – setting up reactions.
4	9-25-17 Mon		Cell splitting	Trypsinization and splitting of cells– **SOP 11**. Finish SOP 9.
4	9-26-17 Tues		Standard Curve construction	Protein Assay and unknown– **SOP 12** Spectrophotometer **Lab book grading**
4	9-27-17 Wed			**Exam #2**
4	9-28-17 Thur		Assess cell Phenotype	Effect of cell microenvironment on chondrocyte phenotype – **SOP 13** Plate cells in monolayer, alginate & collagen
4	9-29-17 Fri		Viability assay	Chemical treatment of cells and assay for cell viabiility **SOP 14**
5	10-03-17 Tues9 AM-3PM	Scientific fraud prevention.	International and Federal Guidelines for pre-clinical trial lab data	Quality Assurance Associates Seminar by Paul Swidersky – full day.
5 5	10-4-16 Wed	Scientific fraud prevention.	International and Federal Guidelines for pre-	Quality Assurance Associates Seminar by Paul Swidersky – half day.

RUSH Rush is a not-for-profit health care, education and research enterprise comprising Rush University Medical Center, Rush University, Rush Oak Park Hospital and Rush Health.
© 2012 Rush University Medical Center

			clinical trial lab data	
5	10-5-17 Thur			**GLP Certification Exam**
5	10-6-17 Fri		Extracellular matrix assays	Analyze morphology, cell number and matrix production for chondrocytes after one week of culture under different conditions. **SOP 13**
6	10-10-17 Tues			Pool and analyze class data. **Exam #3** **Lab Books collected and graded.** Check calibration of pipets – redo SOP 5

RUSH Rush is a not-for-profit health care, education and research enterprise comprising Rush University Medical Center, Rush University, Rush Oak Park Hospital and Rush Health.
© 2012 Rush University Medical Center

RUSH UNIVERSITY

Course Syllabus: BTN532 Laboratory Techniques II **Fall 2017**

Instructor Name	Thomas Schmid, PhD
Email	Tom_Schmid@rush.edu
Work Phone	312-942-3051
Fax	312-942-3053
Preferred Method of Contact	Email
Office Hours:	by appointment, 524 Cohn.
Credit Hours	**2**

Course Purpose/Description

This is the second course in a series of 6 laboratory courses for biotechnology students. The overall purpose of this biotechnology degree is to train students to become effective laboratory technicians. This course will provide general training in chromatography and protein purification. The students will separate serum proteins by gel filtration and ion exchange chromatography. They will measure their protein yields at each step. They will analyze the purity of their fractions by SDS-PAGE and image analysis. The students also will perform affinity chromatography experiments and purify a lectin from peanuts. The students will perform a 2D gel electrophoresis. The students will study trypsin enzyme kinetics. The students will perform ELISA assays and Western blots to analyze the content of lubricin in some biological fluids.

Course Format *(online, face-to-face, etc.))*

The course is taught by short lectures that motivate and provide conceptual foundations, followed immediately by laboratory exercises/experiments performed according to written protocols or Standard Operating Procedures. The laboratory notebook will comprehensively document these activities, observing rules for reliable documentation (Good Laboratory Practice). The numerical data resulting from the exercises will typically be analyzed by students after the laboratory period has concluded and documented in their notebooks. The quality of the results and their analysis will influence course grades. The exams will test the understanding of underlying principles of the assays, and of the strengths and limitation that affect their application. Lab format and expectations for SOPs and lab notebooks will be similar to BTN531. For laboratory notebook write-ups, a background introduction is provided, as is the methods section. The data is shared between the two students in the group. However each student must analyze their data, answer any questions, and discuss their results individually. Each student in a group will turn in their own notebook for a grade. **Having the same or highly similar results and/or discussion sections by two students will be considered plagiarism.** Some experiments will involve the analysis of the data of the entire class. Groups are not allowed to use other groups' or other students' data unless they receive permission from Dr. Schmid. Success in this course implies that you can work in a laboratory with minimal to no training in these techniques using similar instruments.

Meeting Days and Times *(table)*

Classes will be held from October 25, 2016 through December 7, 2016. Class will begin at 8:30AM and finish by 12 noon. Please consult the class schedule for specific days. In general the laboratory classes will be held in AAC722.

Required Text(s) *(full citation)*

None

Recommended Text(s) *(full citation)*

On Reserve in the library:
At the Bench by Kathy Barker, Cold Spring Harbor Press.
Lab Math by Danny Spencer Adams, Cold Spring Harbor Press

Required Equipment/Uniforms

Laboratory coat will be provided.

Software *(full citation)* **None**

Pre-requisites (courses, achieved competencies) None

Course Learning Objectives

The goals of this course are to:

1. Students should be able to perform introductory protein purification techniques with minimal supervision.
2. Students should be able to separate IgG and albumin from bovine serum using gel filtration and ion exchange chromatography.
3. Students will be able to perform routine gel electrophoresis using a BioRad apparatus with precast gels or with their own manually casted acrylamide gels.
4. Student will be able to measure the relative abundance of proteins on their stained gels using an image analysis system with protein standards.
5. Students will be able to perform enzyme assays, ELISAs and Western blots in order to quantitate the levels of specific proteins in complex protein mixtures.

Proctored Assessment(s) *(as applicable)*

Course director and teaching assistants;
Larry Madsen (Lawrence_Madsen@rush.edu) 312-563-2435
John Gallagher (John_Gallagher@rush.edu) 312-563-2435

© 2012 Rush University Medical Center

Attendance

Attendance is required at all lectures and laboratories. Work can only be made up, if at all, with a ***documented*** personal or family emergency – see **BTN Program Statement of Attendance Policy.**

Late Work

Students are expected to be on time for class. A sign in sheet will be posted before each class period. Students must sign in for each class. At 8:40AM or 10 minutes after the start of class the sign in sheet will be collected. Any student arriving more than 10 minutes late will be considered tardy for that class. Each student will receive one tardy day without penalty, after that one point (5%) will be deducted from the lab grade for that day. Similarly, one point (5%) will be deducted for each day a lab notebook is not turned in on time.

Learning Groups *(as applicable)*

For most experiments student will work in group pairs. In some experiments, especially lab technique practicals, the students will work independently (not in pairs)TBD BY FACULTY

Evaluation

Notebook and performance	55%
Examinations	45%

Grading Scale

A = 90-100%
B = 80-89%
C = 70-79%

Course communication, expectations, and etiquette

The purpose of this course is to provide laboratory training for professional researchers. Therefore it is expected that students in this course will strive to exemplify professional behavior. Unprofessional and rude behavior will not be tolerated, and will be penalized by deducting points from laboratory notebooks grades. Some examples of unprofessional and rude behavior are: disrespecting other students, teaching assistants and instructors, using cell phones or notebook computers during class lectures and lab experiments (laboratory notes should be written as raw data in your bound lab notebook), turning your back to a teacher during his or her lecture, sleeping in class, doing other coursework in class.

The purpose of the discussion boards is to allow students to freely exchange ideas. It is imperative to remain respectful of all viewpoints and positions and, when necessary, agree to respectfully disagree. While active and frequent participation is encouraged, cluttering a discussion board with inappropriate, irrelevant, or insignificant material will not earn additional points and may result in receiving less than full credit. Frequency is

© 2012 Rush University Medical Center

not unimportant, but content of the message is paramount. Please remember to cite all sources—when relevant—in order to avoid plagiarism.

Disability Accommodations

Rush University wishes to ensure that access to its facilities, programs and services are available to students with disabilities. The University provides reasonable accommodations to all students on a non-discriminatory basis consistent with legal requirements as outlined in the Americans with Disabilities Act (ADA) of 1990 and the Rehabilitation Act of 1973 and applicable implementing regulations of these statutes. A reasonable accommodation is a modification or adjustment to an instructional activity, facility, program or service that enables a qualified student with a disability to have an equal opportunity to participate in all Rush University student activities.

Additional information on disability accommodations and programs can be found at: http://www.rushu.rush.edu/catalog/aboutrush/disabilityrights.html.

Academic Honesty and Conduct

Rush University students and faculty belong to an academic community with high scholarly standards. As essential as academic honesty is to the relationship of trust fundamental to the educational process, academic dishonesty violates one of the most basic ethical principles of an academic community, and will result in sanctions imposed under the University's disciplinary system.

Students will be held responsible for adhering to the policy on student academic honesty and conduct as stated in the RUCatalog. Academic dishonesty will result in sanctions imposed under the University's disciplinary system. Disciplinary actions range from warning, probation, suspension or expulsion from the University/Medical Center.

Additional information on Academic Honesty and Conduct can be found at: https://www.rushu.rush.edu/catalog/acadresources/academichonesty.html

Intellectual properties protection

A core mission of Rush is to improve the public health. For this reason, Rush University Medical Center ("Medical Center") supports the research efforts of its faculty, staff, employees and students (collectively "Covered Individuals ‖). One way this is accomplished

© 2012 Rush University Medical Center

is by seeking patent protection for new technologies so they can be transferred to the private sector through licensing for further development, commercialization and distribution to the public.

All materials contained within this syllabus, course and course materials, whether in written form or presented any electronic transmission medium, represent the intellectual property of faculty or Rush University Medical Center. Students are prohibited from sharing or transmitting content or materials through any media without express consent or permission of the copyright holder. All rights reserved. Copyright (Rush University Medical Center (or faculty) and year).

Additional information on Intellectual Properties protection can be found at: https://www.rushu.rush.edu/servlet/BlobServer?blobcol=urlfile&blobtable=document&blobkey=id&blobwhere=1284398791946&blobheader=application%2Fpdf&blobnocache=true

FERPA

Rush University takes seriously its commitment to protect the privacy of our students and their education records. In addition to upholding the Family Educational Rights and Privacy Act of 1974 (FERPA), Rush University has taken further steps to protect a person's privacy by extending similar benefits afforded to enrolled students under FERPA to individuals who are applying for admission. If a specific privacy/confidentiality question is not answered in this text, please contact the Office of the Registrar.

Nothing in this policy may be construed to prohibit the University from disclosing information provided to the institution under the Violent Crime Control and Law Enforcement Act concerning sex offenders who are required to register.

Additional information on FERPA can be found at: http://www.rushu.rush.edu/servlet/Satellite?MetaAttrName=meta_services&ParentId=1320160786561&ParentType=RushUnivLevel2Page&c=content_block&cid=1320160786609&level1-p=2&level1-pp=1204497836743&level1-ppp=1204497836743&pagename=Rush%2Fcontent_block%2FContentBlockDetail&rendermode=previewnoinsite

© 2012 Rush University Medical Center

HIPPA, Access, Use and Disclosure

TBD

Course Schedule and program

Important Note: Changes may occur to the syllabus at the instructor's discretion. When changes are made, students will be notified via an announcement.

Week	Date	Topic
1	Wed 10-11	Chromatography: Gel Filtration /Gel Permeation
1	Thur 10-12	Chromatography: Ion Exchange
1	Fri 10-13	Chromatography: Affinity chromatography
2	Mon 10-16	Electrophoresis: Precast gels
2	Tue 10-17	Electrophoresis: Image Analysis
2	Wed 10-18	Electrophoresis: Casting Polyacrylamide Gels
2	Thur 10-19	Electrophoresis: Discontinuous Gels
2	Fri 10-20	**Exam 1** + image analysis
3	Mon 10-23	Trypsin assay
3	Tue 10-24	Protease Assay: EnzChek
3	Wed 10-25	Protease Assay: EnzChek, ELISA
3	Thu 10-26	ELISA
4	Thur 11-2	ELISA
4	Fri 11-3	**Exam 2**
5	Thur 11-9	Western Blot
5	Fri 11-10	Western Blot
6	Fri 11-17	Western Blot
7	Thur 11-23	**Happy Thanksgiving!**
8	Fri 12-1	**Final Exam and Lab notebooks collected**

© 2012 Rush University Medical Center

RUSH UNIVERSITY

Course Syllabus: *BTN 533;* Basic Methods in Molecular Biology and Biotechnology Laboratory Term: October-December; Year:2017

Instructor Name	Dan Predescu MD
Email	dan_predescu@rush.edu
Work Phone	**312-563-24365**
Fax	312-942-0339
Preferred Method of Contact	Email/ Phone
Office Hours:	Office located in Jelke 1415A. Any discussion, inquiry or proctoring activity should be done by appointment only.
Credit Hours	**3**

Course Purpose/Description

The course is created to provide the students with the necessary skills required in a Molecular Biology Laboratory. The course intends to:

1. Enhance the student's ability to identify the critical elements of basic technique or procedure, in order to solve questions for which documented answers are not close at hand;

2. Clarify the everyday practice of the methods taken for granted, yes very often misused, wrongly applied or misinterpreted;

3. Develop critical thinking related to the subjects from syllabus,

4. Improve and verify students' skills in order to prepare them for work in a molecular biology lab,

5. Develop the basic laboratory techniques of a biotechnology or bioscience lab,

6. Develop critical thinking skills in the students

7. Encourage teamwork and accountability among the students

8. Practice accuracy in calculations and in writing scientifically o

9. Develop multitasking skills

10. Encourage students to take charge of their learning

Course Type & Format: *Hands-on laboratory, individual presentations*

This course will consist of "hands-on-procedures = Practicum", short introductory lectures prepared and presented by students, 5-6 quizzes and a Final Exam.

Class will meet at **8:30 am** and end by **12:00 noon**.

Please consult class schedule for specific time and day.

Every student will receive besides written **Standard Operating Procedures,** a mailed SOP for each laboratory at the beginning of every week.

The set of Standard Operating Procedures (SOPs) provided during the class must be:

i) completed, ii) signed by the instructor, and iii) pasted into the laboratory notebook,

The Students are expected to read the protocol(s) before each session starts. Most of the necessary information will come from short conceptual talks, SOPs introduction chapters and hands-on classroom experience. ***Introductory lectures are given during the class.***

Students will work in pairs and/or individually. Pairs are assigned at the beginning of the course and the **students (individual or pairs) are responsible for leaving their workstations clean and orderly for the next laboratory session**.

Meeting Days and Times *(as specified in the table on the next page)*

Week	Date/day	Format	Topic	Instructor room
1	10-31 Tuesday	Lecture 1	**Welcome Class of 2017. What is biotechnology? Safety rules in a Molecular Biology laboratory/Toward the digital laboratory**	DP AB 722
1	11-01 Wednesday	Practicum	**Fast methods for:** *DNA and RNA assays; testing of pipetting skills* **(SOP #1, 2); *Introductory lecture I:***	DP AB 722
2	11-06 Monday	Practicum	**Working with bacteria I:** *Growing bacteria/bacterial culture, media preparation* **(SOP #3); *Introductory lecture II:***	DP AB 722
2	11-07 Tuesday	Practicum	**Isolation of Genomic and Plasmid DNA from bacteria, (SOP #4 and #5);** *Skill testing;* ***Introductory lecture III:***	DP AB 722
2	11-08 Wednesday	Practicum	**Genotyping:** Mouse ***(SOP#6)*** and Drosophila Genotyping, **(SOP #7); Quiz I (weeks 1 and 2); Introductory lecture IV**	DP AB 722
3	11-13 Monday	Practicum	**Agarose gel electrophoresis:** *pouring, running, the basics* **(SOP #8);** *Skill testing;* ***Introductory lecture V:***	DP AB 722
3	11-14 Tuesday	Practicum	**Working with bacteria II / bacterial transformation-pGLO- (SOP #9) / β-Gal *(SOP#10); Introductory lecture VI:***	DP AB 722
3	11-15 Wednesday	Practicum	**Working with bacteria III:** *GFP isolation* **(SOP #11*);*** *Skill testing;* ***Introductory lecture VII:***	DP AB 722
4	11-20 Monday	Practicum	**Working with bacteria IV:** *GFP characterization II* ***(SOP #12),*** **eukaryotic cell transformation with β-Gal*; I ntroductory lecture VIII:***	DP AB 722
4	11-21	Practicum	**Working with bacteria V;** *GFP* **/ β-Gal** *data analysis* **(SOP #13); Quiz II (weeks 3&4)**	DP AB 722
5	11-27 Monday	Practicum	**Gene Cloning I;** *Restriction Digestion/Ligation* ***(SOP # 14 and #15);*** *Skill testing;* ***Introductory lecture IX:***	DP AB 722
5	11-28 Tuesday	Practicum	**Gene Cloning II:** *Ligation continued* **(SOP #16); *Introductory lecture X***	DP AB 722
5	11-29 Wednesday	Practicum	**Gene Cloning III:** *Data analysis for ligation* ***(SOP #17);*** *Skill testing;* ***Introductory lecture XI; Note Book (NB) assessment***	DP AB 722
6	12-04 Monday	Practicum	**Cell culture I: eukaryotic cell culture/ staining/counting (SOP # 17); Cell culture II: mammalian cell types (SOP #18); *Introductory lecture XII;*** *Skill testing;* ***Quiz III (weeks 4&5)***	DP AB 722
6	12-05 Tuesday	Practicum	**Viral infection / (SOP #19); Viral nature of diseases *(SOP#20)*** */Skill testing* ***NB assessment***	DP AB 722
6	12-06 Wednesday	Practicum	**PCR I**: *Introduction, basics, primer design* **(SOP #21); *Introductory lecture XIII*** ***NB assessment***	DP AB 722
7	12-11 Monday	***Practicum***	**PCR II**: *Mt-DNA analysis* **(SOP #22)** *finishing genotyping* **(SOP #23);** *Skill testing;* ***Introductory lecture XIV;***	DP AB 722
7	12-12 Tuesday	Practicum	**RT-PCR:** *HIV application* **(SOP #25); *Introductory lecture XV;*** ***Quiz IV (weeks 7&8) NB assessment***	DP AB 722
7	12-13 Wednesday	Practicum	**qPCR- introduction: D Gerard (SOP #26); *Introductory lecture XVI*** ***NB assessment***	DP AB 722
7	12-14 Thursday	***Practicum***	**qPCR- application- II - (SOP #28)**	DP AB 722
8	12-21 Thursday		12-21 (8:30 – 12:00) **F I N A L E X A M**	2 - TA

© 2012 Rush University Medical Center

Recommended Text: Short Protocols in Molecular Biology, by F. M Ausubel et all, John Wiley & Sons Inc. ISBN 0-471-32938-X.
Outside of this basic manual I would like to acknowledge the contributions of the following sources in the development of this labsyllaby:
1. Shoestring Biotechnology, by Kathy Frame (ed.). National Association of Biology Teachers (2002)
2. Basic Laboratory Methods for Biotechnology, by Lisa A. Seidman & Cynthia J. Moore. Prentice Hall (1999)
3. Dolan DNA Learning Center: www.dnalc.org
4. Molecular Biology Problem Solver edited by Alan S. Gerstein ISBN 0-471-37972-7
5. Geospiza web site (www.geospiza.com)
6. Bio-link web site (www.bio-link.org)
7. Seidman & Moore, Basic Laboratory Methods for Biotechnology: Textbook & Laboratory Reference, 2nd edition. 2009. Prentice Hall. ISBN: 0321570146
8. Laboratory security: http://ehs.uky.edu/ohs/labsecurity.html
9. Bio.org: http://www.bio.org/about_biotech/.

Required Equipment/Uniforms: Students must wear at all-time: ***LABORATORY COATS***, long pants, full length skirts, complete shoe and goggles as needed. Long hair must be tighten and covered with a hat. ***NO FOOD OR DRINKS ARE ALLOWED IN THE LAB.***
Software *NA*

Pre-requisites (courses, achieved competencies) NO specific prerequisites.

Course Learning Objectives:

BTN 533 is designed as an introductory course to basic skills of molecular biology. The purpose of this course is to give students "hands-on experience" with the fundamental techniques of molecular biology, as well as an understanding of their applications. At the end of the course you should be familiar if not have learned the following techniques:

- Isolation of microbial and mammalian DNA
- Genomic DNA digestion (restriction digestion)
- Agarose gel Electrophoresis and visualization of DNA in gels
- Ligation of foreign DNA to create recombinant molecules, molecular cloning
- Bacterial transformation, Selection of positive colonies, Analysis of transformants
- Isolation of plasmid DNAs
- Amplification of a DNA fragment by the Polymerase Chain Reaction (PCR)
- Genotyping by PCR
- Reverse transcriptase PCR (RT-PCR), q PCR –
- Viruses lytic cycle, viral detection
- Cell types, fate, differentiation and removal

Exam A final exam, as scheduled, will complete the evaluation of students' skills and accomplishments.

Proctored Assessment(s): will be allowed only for the Note books content and should be discussed directly with the course director. It is expected that the will have all Note books actualized (the SOP previous to the last one) on time as specified by the Dr. Dan Predescu.

© 2012 Rush University Medical Center

Attendance:

All students should register for this class. Grading for this class is not pass or fail.

Full attendance at all laboratory sessions is required for all students. Being present in the class is recoded at the beginning (8:30 am) under your signature. **Showing up 15 or more minutes after, the starting of a class, will be considered unpunctuality and after 3 "lethargic accumulations"** the student will have deducted 1% from its/hers attendance. After 5 *"lethargic starts*" a recovery of student attitude will be done by the Director of BTN program at Rush (Dr. G Szabo); *and a makeup of time missed will be well thought-out between the student and the Course Director.*

No make-ups are allowed for laboratory work, examination or quiz except when advance permission from the course director is obtained. Permission will be granted only under exceptional circumstances and must be accompanied with a documented letter (see **BTN Program Statement of Attendance Policy).**

Learning Groups The students will work in pairs and every member of the pair is equally responsible for the quality, soundness and accuracy of the experimental results. The introductory presentations MUST be prepared collectively by the members of a pair, presented by both members and their content is a shared responsibility.

Evaluation

The student's final grade will be based on *attendance, cumulative experimental performance, laboratory Note Book, assignments, quiz and examination*. Attendance will be taken within the first 5 minutes at the beginning of class and punctual attendance will count towards the final grade. The class is governed by the rules and regulations of the Rush University Academic policies and honesty as stated in the Rush University Bulletin. Links to these policies are given as follows:http://www.rushu.rush.edu/bulletin/academicpolicies.html; http://www.rushu.rush.edu/bulletin/acadhon.html

The following benchmarks will be considered for every grade:

Laboratory Notebook	20%
Laboratory Performance – skills -	31%
Quizzes	6%
Cumulative Final Examination	30%
Introductory lecture	***5%***
Attendance	**8%**

Total Points: 100 pts

Grading Scale

A= 90%–100%
B= 80%–89%
C= 70%–79%

Course expectations and etiquette:

The purpose of this course is to provide a worthwhile laboratory experience which demands strict adherence to prescribed rules for personal and environmental safety and *this is the #1 prerequisite expected from every student attending BTN 533.* The former reflects concern for your personal safety in terms of avoiding laboratory setting to prevent:

i) Laboratory accidents or extended contamination,

© 2012 Rush University Medical Center

ii) Unwanted exposure to physical agents and chemical reagents,
iii) Disrespectful conduct and anti-collegial attitudes,
iv) Tampering or contamination of experimental procedures by exogenous influences.

A) **General etiquette:** There are special approaches and precautions that must be taken in any biological laboratory. This includes procedures for safe handling and storage of hazardous chemicals and biologicals. Also, the special methods for setting up and following detailed protocols are emphasized, as well as methods for recording and archiving results properly.

B) **Basic Expectations from the students:**
Safety in the Laboratory
Math Skills for the Laboratory
Documentation and the Lab Notebook
Molar Solutions and Dilutions.

C) **Instruments and Equipment Usage/Handling:** An important part of working in any laboratory is the proper use and calibration of instruments and equipment. You will become familiar with general information about the use of lab equipment, as well as more detailed information about the step-by-step procedures for the specific instruments that you use.

Includes: Basic Tools in the Biotechnology Laboratory
Using, maintaining and calibrating a Micropipette
Calibrating Lab Instruments balances and pH meters
Restriction Enzyme Mapping of DNA
Agarose gel electrophoresis
GFP and plasmid isolation using chromatography columns,
DNA Fingerprinting:
PCR thermal cycler
qPCR

Regulatory Affairs
Purpose: You will work on writing skills and how to follow Standard Operating Procedures (SOPs) and fill out forms, in the laboratory.
The regulations governing biological laboratories dictate the safety procedures and protocols for disposal of hazardous chemicals and biologicals.
Includes: Safety in the Laboratory
Documentation and the Lab Notebook Supplemental ―SOP
Solution Preparation & Gel Electrophoresis forms.

Email use is allowed for communications with the personnel of the course or Graduate College. IT IS NOT PERMITED TO use, check it or discuss with other students during laboratory time.

Blackboard use. The purpose of the blackboard is to allow students to freely exchange ideas. Thus its usage, during laboratory time, is permitted for transmitting, learning and discussing the content, results and/or hypothesis related to the SOP and/or presentation of the day. In consequence NO COMERCIAL, PERSONAL, SOCIAL and POLITICAL announcements are allowed.

© 2012 Rush University Medical Center

Discussion use. As the drive of the discussions, during BTN 533 time, is to clarify and give to all students the possibility to enhance their skills and critical thinking, while building strong, responsible characters.
It is imperative to remain respectful of all viewpoints and positions and, when necessary, agree to respectfully disagree. While active and frequent participation is encouraged, cluttering a discussion with inappropriate, irrelevant, or insignificant data or "fake news" will not earn additional points and may result in receiving less than full credit. Frequency is not unimportant, but content of the message is paramount. Please remember to cite all sources—when relevant—in order to avoid plagiarism when making your presentations.

Disability Accommodations

Rush University wishes to ensure that access to its facilities, programs and services are available to students with disabilities. The University provides reasonable accommodations to all students on a non-discriminatory basis consistent with legal requirements as outlined in the Americans with Disabilities Act (ADA) of 1990 and the Rehabilitation Act of 1973 and applicable implementing regulations of these statutes. A reasonable accommodation is a modification or adjustment to an instructional activity, facility, program or service that enables a qualified student with a disability to have an equal opportunity to participate in all Rush University student activities.

Additional information on disability accommodations and programs can be found at: http://www.rushu.rush.edu/catalog/aboutrush/disabilityrights.html.

Academic Honesty and Conduct

Rush University students and faculty belong to an academic community with high scholarly standards. As essential as academic honesty is to the relationship of trust fundamental to the educational process, academic dishonesty violates one of the most basic ethical principles of an academic community, and will result in sanctions imposed under the University's disciplinary system.

Students will be held responsible for adhering to the policy on student academic honesty and conduct as stated in the RU-Catalog. Academic dishonesty will result in sanctions imposed under the University's disciplinary system. Disciplinary actions range from warning, probation, suspension or expulsion from the University/Medical Center.

Additional information on Academic Honesty and Conduct can be found at:
https://www.rushu.rush.edu/catalog/acadresources/academichonesty.html

Intellectual properties protection

A core mission of Rush is to improve the public health. For this reason, Rush University Medical Center ("Medical Center") supports the research efforts of its faculty, staff, employees and students (collectively "Covered Individuals‖). One way this is accomplished is by seeking patent protection for new technologies so they can be transferred to the private sector through licensing for further development, commercialization and distribution to the public.

All materials contained within this syllabus, course and course materials, whether in written form or presented any electronic transmission medium, represent the intellectual property of faculty or Rush University Medical Center. Students are prohibited from sharing or transmitting content or materials through any media without express consent or permission of the copyright holder. All rights reserved. Copyright (Rush University Medical Center (or faculty) and year).

© 2012 Rush University Medical Center

Additional information on Intellectual Properties protection can be found at:
https://www.rushu.rush.edu/servlet/BlobServer?blobcol=urlfile&blobtable=document&blobkey=id&blobwhere=1284398791946&blobheader=application%2Fpdf&blobnocache=true

FERPA

Rush University takes seriously its commitment to protect the privacy of our students and their education records. In addition to upholding the Family Educational Rights and Privacy Act of 1974 (FERPA), Rush University has taken further steps to protect a person's privacy by extending similar benefits afforded to enrolled students under FERPA to individuals who are applying for admission. If a specific privacy/confidentiality question is not answered in this text, please contact the Office of the Registrar.

Nothing in this policy may be construed to prohibit the University from disclosing information provided to the institution under the Violent Crime Control and Law Enforcement Act concerning sex offenders who are required to register.

Additional information on FERPA can be found at:
http://www.rushu.rush.edu/servlet/Satellite?MetaAttrName=meta_services&ParentId=1320160786561&ParentType=RushUnivLevel2Page&c=content_block&cid=1320160786609&level1-p=2&level1-pp=1204497836743&level1-ppp=1204497836743&pagename=Rush%2Fcontent_block%2FContentBlockDetail&rendermode=previewnoinsite

Course Schedule and program

Important Note: Changes may occur to the syllabus at the instructor's discretion. When changes are made, students will be notified via an announcement.

© 2012 Rush University Medical Center

Appendix: Excerpts from the Rush University Catalog:

The University Catalog specifies the rules that govern the Graduate College and its Programs. Each Program may have additional policies and procedures providing that they do not conflict with those specified in the Catalog.

As a service to students and faculty, the Academic Policies, Academic Standing and Appeal sections of the Catalog have been reprinted in this Appendix. Please Note: Since the University Catalog for the current year is not available until the start of classes, the excerpts given here are from last year's Catalog. Please check the website http://www.rushu.rush.edu/catalog/ for the current Catalog.

You are governed by the policies in effect at the time you entered Rush Univ. A copy of the Catalog for each academic year is kept on line in a PDF file. A change in the policies can be made provided you are notified in writing or by email.

The Graduate College: Academic Policies:

The Graduate College adopts college-wide policies and procedures and reviews division regulations. Students follow the college and division policies in effect at the time of initial matriculation in The Graduate College. However, The Graduate College reserves the right to make substantive changes in its programs after the student's matriculation. Students will be informed in writing by the division director of any changes made during their tenure in the program. Students re-entering the college after an absence will be guided by policies and procedures in effect at the time of re-entry.

Examination Policy:

Re-enforcing the examination policy of the college is the responsibility of the individual course director, who will inform students and the proctors about the examination requirements for that particular course. A period at the end of the semester is provided for examinations; however, any form of assessment can be conducted at any week of the semester. This information will be included in the course schedule and syllabus.

Pass/No Pass Grading Option

Each program identifies all courses required of its students. Required courses are usually taken for letter grade and not under the pass/no pass (P/N) option. Research hours are generally graded using the P/N option. However, a program may opt to provide a letter grade for research classes. The grading policy for post-candidacy research hours (over 600) for doctoral students is graded as P/N.

Good Academic Standing:

To remain in good academic standing, students must maintain a cumulative grade point average of 3.0 and meet the requirements of his/her division. A student must be in good

academic standing to be admitted to candidacy and to graduate. Students failing to maintain a GPA of 3.0 will be notified by the Dean in writing of a change in their status to probationary status. Any student who fails to remediate this deficiency within one academic year or is placed on probationary status a third time is subject to dismissal by The Graduate College.

Academic Difficulty:

Each program has policies and procedures regarding students who fail to maintain good academic standing. While the responsibilities of informing students of their academic problems and of establishing conditions for regaining good academic standing reside within the program, The the Graduate College Council monitors the progress and promotion of all students and gives final approval to award students' degrees.

Dismissal:

Each program establishes grounds for dismissal beyond the minimal criteria established by The Graduate College. Should a program recommend the dismissal of a student, the director will forward such recommendation to The Graduate College Council for final action. Letters of dismissal come from the Dean. Appeal of a dismissal action begins within the appropriate program.

Full-time Enrollment:

Full-time enrollment is required of all Graduate College students with the exception of the clinical research students and students within the PhD programs in nursing science and health sciences. Full-time students must register for at least nine semester hours for each term, except when advised differently. Students must obtain written permission from the program director for exceptions to this policy. Students receiving a thesis-requiring master's degree from The Graduate College as a full-time student must be enrolled for all terms between their matriculation and graduation. The average length of this program is five semesters. Part-time students earning a master's degree must be enrolled a minimum of two semesters per academic year. The accelerated, non-thesis master's program's length is two semesters. The minimum requirement for graduation from the college is program specific. At the time of graduation, the student must be enrolled in the College. The maximum time allowed to graduate from a full-time thesis-requiring master's degree program is four years starting the first semester of official enrollment and for the PhD degree is five years.

Residency:

Doctor of Philosophy (PhD) candidates are expected to meet all requirements for graduation within five enrolled academic years in The Graduate College (excluding leaves of absence [see below]). This period begins with the semester in which the student formally matriculates. A student exceeding that time limitation must submit to the graduate council, in writing, a request to extend their candidacy beyond that time period. This request must identify the reasons for the extension and provide a written plan with reasonable deadlines for completion. This document will be co-signed by the student's advisor and program director. The council will then vote whether to accept the extension or not (passed by simple majority). The student's advisor will then provide an update on the student's progress after six months. One year after the extension is granted, the

student is expected to complete all requirements. A second request may be made by the student's advisor and program director, but will be accepted only through a two-thirds majority of the voting members present at a formal hearing of the Graduate College Council. Within one year of that second request, the student must complete all requirements for the PhD degree or face dismissal. Alternatively, the student may be awarded a MS degree upon the recommendation of the student's graduate program.

Readmission:

Any student who has withdrawn from the University or any dismissed student may apply for readmission by submitting an application for this purpose to the College Admission Office. An interview may be required. A re-entering student must meet the conditions for re-enrollment stated in his/her dismissal or re-entry acceptance letter and all policies, requirements and course sequence in effect at the time of re-entry. The student will pay tuition and fees at the rates in effect at the time of re-enrollment. Application deadlines may vary by division.

Academic Progression:

The graduate program in concert with the rules of the College and Rush University develop specific regulations governing the process that results in final awarding of the degree. While such regulations differ slightly from one program to another, The Graduate College Council reviews each regulation for approval. Programs are required to be explicit and clear about regulations that will affect the candidate. This must be stringently observed in program regulations concerning selection of principal advisors, advisory committees, and a plan of study. Similarly, divisions will be explicit and clear concerning academic policies and procedures surrounding qualifying, preliminary, and final examinations when they are required. The programs are also responsible for providing the candidate with the support needed to plan and conduct the dissertation research. At the same time, a major responsibility of the student is to become familiar with the regulations and expectations of his/her chosen program. These regulations and expectations are included in the University Catalog within the sections devoted to each divisional program and are also included within program publications. The student is responsible for understanding the regulations and monitoring changes that may occur during their tenure in the program.

Student Academic Appeals Policy:

Any student of The Graduate College may appeal a final course grade, failure on a preliminary or comprehensive examination, or failure of the thesis or dissertation that results in his or her academic probation or dismissal from the University. A student may also appeal an unreasonable delay in his or her graduation from the University. No other issues may be appealed through this process.

The process for filing an appeal is maintained by each program. The student may request a copy of the program appeal process from the program director. This process will be completed within one semester. If a resolution cannot be achieved at the Division level, the following procedure must be followed. At any step in the process, the student may withdraw the appeal by written notification to the program director with a copy to the

Dean. In the event of a dismissal decision, a student may continue to enroll until the appeal process is completed or the student withdraws the appeal.

Step 1: If the student wishes to appeal the decision beyond the program, within two weeks of receiving a decision from the program, the student will submit a written statement to the Dean requesting consideration of his or her case by an advisory panel. The student must provide the following in the written statement.

- Course number and grade being appealed or other cause for probation or dismissal, i.e., failure of preliminary or comprehensive examination, or thesis or dissertation
- Action being requested
- Justification for the request
- An outline of the efforts and actions already taken to obtain consideration of the request

The student will send copies of this communication to the program director and the Dean's office. In addition, if a course grade is being appealed, the student will send a copy to the course director. If the evaluation of a thesis or dissertation is being appealed, the student will send a copy to the chairperson of the thesis or dissertation committee. The advisory panel will be the Graduate College Council. Its chairperson will be appointed by the Dean from among the members. The program director of the student's program and any other member who is evaluating the student's academic status will not vote.

Step 2: Within two weeks after notification to the Dean, the Chairperson of the Advisory Panel will arrange a meeting of the Advisory Panel. It will submit a written recommendation to the Dean.

Step 3: Within two weeks following receipt of the advisory panel's recommendation and upon discussion with the student and with others as appropriate, the Dean shall reach a final decision and notify each party of the decision. The decision reached by the Dean is final.

The issues discussed and the outcomes of all meetings in this appeal process are documented. This record-keeping is the responsibility of a faculty member who is to be designated at each meeting. Copies of the documentation should be distributed to the individuals present at a meeting, to the program director, the Dean and to the student's academic file.

Rush University Academic Policies

The Academic Resources and Policies section of this catalog contains additional Rush University academic policies.

This Rush University catalog also details the policies regarding inclusion of minorities and those with disabilities, as well as the policies and procedures for reporting

harassment. Students who may need special accommodations can access this information at https://www.rushu.rush.edu/students-disabilities.

Academic Honesty and Student Conduct

The Graduate College and its programs follow the University policies on academic honesty and the University statement on student conduct. Each student is expected to conduct himself or herself at all times in a professional manner - a manner which conforms to the ethics of the profession, and which instills confidence in one's abilities as a working scientist. Irresponsible, unprofesisonal or unehtical behavior, as determined by the Graduate Honor Code Committee may results in dismissal from the program.

The College and its programs will not condone cheating in any form. Allegations of cheating will be reviewed by the program director with the help of an ad hoc committee. If merited, the report will be forwarded to the Graduate College Honor Code Committee.

Diversity, Equal Opportunity, Affirmative Action:

For over three decades, the Rush approach to equal opportunity and diversity has not wavered. It is that equal opportunity and diversity in employment, education, and the delivery of health care are essential and must be furthered. This is a continuation of a policy that emanated from the Hospital Charters of 1865 and 1883 and the documents governing the establishment of Rush University in 1972.

In certain instances, the implementation of these policies requires the use of affirmative action initiatives. At Rush these are focused on strong recruitment and programming efforts, not on the use of quotas - and these recruitment and programming efforts will be continued, consistent with federal, state, and municipal guidelines.

In keeping with its goal of promoting diversity through its equal opportunity and affirmative action programs, Rush University is committed to attracting students who will enable the student body to achieve the educational benefits of diversity, and to provide services to all students, faculty, and other employees on a nondiscriminatory, equitable basis. Discrimination or harassment against any member of the Rush University Medical Center community because of race, color, gender, sexual orientation, religion, national origin, ancestry, age, marital status or parental status, disability as defined by Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act, or any other category protected by federal or state law is prohibited and will not be tolerated, nor will any person for those reasons be excluded from participation or denied the benefits of any program or activity within Rush University. Beverly B. Huckman, Associate Vice President for Equal Opportunity in the Office of the President, has been designated to oversee the implementation of this policy and can be reached by telephone at (312) 942-7093, by mail (Suite 128, Professional Building), or via e-mail at Beverly_B_Huckman@rush.edu.

Among the responsibilities of this office are:

• Recommending and implementing policies and programs related to diversity, cultural and gender sensitivity, equal opportunity, affirmative action, prevention of discrimination and harassment, and disability rights.

• Encouraging the recruitment of persons from all groups for administrative, faculty, and student positions.

• Mediating faculty, resident, and student complaints related to discrimination or harassment (See the "Harassment, Policies and Procedures" section of this Catalog).

• Additional resources may be found in Human Resources along with the following college offices:

Rush Medical College
Sharon Gates, Director for Multicultural Affairs
(312) 942-3670
Sharon_Gates@rush.edu

College of Nursing
Lucy Willis, Ph.D., Director of Multicultural Affairs
(312) 942-6125
Lucy_Willis@rush.edu

Rush university policies and procedures for students with disabilities:

Office of Student Disability Services

In keeping with its goal to promote diversity among its student population, Rush University is
committed to attracting and educating students who will help to make the population of health care professionals reflective of the national population, including individuals with disabilities. In addition, Rush University is committed to ensuring equal access to its facilities, programs, and services are available to students with disabilities.

To be eligible for accommodations, a student must have a documented disability as defined by the ADA and Section 504 of the Rehabilitation Act of 1973. A reasonable accommodation is a modification or adjustment to an instructional activity, facility, program, or service that enables a qualified student with a disability to have an equal opportunity.

Both the ADA and Section 504 define disability as: (a) a physical or mental impairment that substantially limits one or more major life activities of such individual; (b) a record of such impairment; or (c) being regarded as having such a condition. In order to respect your privacy and ensure a thoughtful interactive process please contact Student Disability Services.

For more information or to request accommodation(s) refer to the contact listed below:

Office of Student Disability Services
Marie Lusk, MBA, MSW, LSW,
Manager, Student Disability Services
Rush University
600 S. Paulina Street, Suite 440
Chicago, IL 60612
Phone: (312) 942-5237
Fax: (312) 942-2778
studentdisabilityservices@rush.edu
https://www.rushu.rush.edu/students-disabilities