

**The Ohio State University
Colleges of the Arts and Sciences Course Change Request**

Microbiology

Academic Unit _____

Microbiology

Book 3 Listing (e.g., Portuguese) _____

522

Course Number

Summer Autumn Winter **X** Spring Year **2009**

Proposed effective date: choose one quarter and put an "X" after it; and fill in the year. See the OAA curriculum manual for deadlines.

A. Course Offerings Bulletin Information. Follow instructions in the OAA curriculum manual. Before you fill out the "Present Course" information, be sure to check the latest edition of the *Course Offerings Bulletin* and subsequent Circulating Forms. You may find that the changes you need have already been made or that additional changes are needed. If the course offered is less than quarter or term, please also complete the Flexibly Scheduled/OffCampus/Workshop Request form.

COMPLETE ALL ITEMS THIS COLUMN

Present Course

1. Book 3 Listing: **Microbiology**
2. Number: **522**
3. Full Title: **Immunobiology**
4. 18-Char. Transcript Title: **Immunobiol**
5. Level and Credit Hours **U G 5**
6. Description: **Cellular and Molecular properties of the immune system**
(25 words or less)
7. Qtrs. Offered : **WI**
8. Distribution of Contact Time: **3 cl, 1 2 hr lab and 1 3 hr lab**
(e.g., 3 cl, 1 3-hr lab)
9. Prerequisite(s): **Micro 509 or Micro 520**
10. Exclusion:
(Not open to....)
11. Repeatable to a maximum of _____ credits.
12. Off-Campus Field Experience:
13. Cross-listed with:
14. Is this a GEC course? **No**
15. Grade option (circle): **X** Ltr S/U P
If P graded, what is the last course in the series?
16. Is an honors version of this course available? Y N **X**
Is an Embedded Honors version of this course available? Y N **X**
17. Other general course information:

**COMPLETE ONLY THOSE ITEMS THAT CHANGE
Changes Requested**

1. _____
2. **522.01**
3. **Immunobiology Lecture**
4. **Immunobiol Lect**
5. **U G 3**
6. _____
7. _____
8. **3 cl**
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____

B. General Information

1. Do you want the prerequisites enforced electronically (see the OAA manual for what can be enforced)? **Yes**
2. Does this course currently satisfy any GEC requirement, if so indicate which category? **No**

3. What other units require this course? Have these changes been discussed with those units? **None**
4. Have these changes been discussed with academic units that might have a jurisdictional interest in the subject matter? Attach relevant letters. **NA**
5. Is the request contingent upon other requests, if so, list the requests?
Yes - New course proposal for Microbiology 522.02



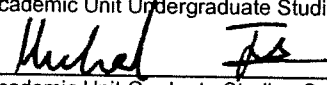

6. Purpose of the proposed change. (If the proposed change affects the content of the course, attach a revised syllabus and course objectives and e-mail to asccurrofc@osu.edu.)

The demand for the course has outpaced the ability of the department to accommodate the students. Some students desire and need the laboratory experience but many others do not necessarily need the laboratory. Dividing the course into separate lecture and laboratory sections will allow us to meet the increased demand and to provide the level of instruction that is commensurate with the current and future needs of the students.

7. Please list Majors/Minors affected by the proposed change. Attach revisions of all affected programs. This course is (check one):
 Required on major(s)/minor(s) A choice on major(s)/minors(s)
 An elective within major(s)/minor(s) A general elective:

8. Describe any changes in library, equipment or other teaching aids needed as a result of the proposed change or if the proposed change involves budgetary adjustments, describe the method of funding:
None

Approval Process The signatures on the lines in ALL CAPS (e.g. ACADEMIC UNIT) are required.

 1. Academic Unit Undergraduate Studies Committee Chair	 Printed Name	12/18/07 Date
 2. Academic Unit Graduate Studies Committee Chair	MICHAEL IBBA Printed Name	12/18/07 Date
 3. ACADEMIC UNIT CHAIR/DIRECTOR	JOHN N. REEVE Printed Name	12/18/07 Date

4. After the Academic Unit Chair/Director signs the request, forward the form to the ASC Curriculum Office, 105 Brown Hall, 190 West 17th Ave. or fax it to 688-5678. Attach the syllabus and any supporting documentation in an e-mail to asccurrofc@osu.edu. The ASC Curriculum Office will forward the request to the appropriate committee.

- | | | |
|---|--------------|------|
| 5. COLLEGE CURRICULUM COMMITTEE | Printed Name | Date |
| 6. ARTS AND SCIENCES EXECUTIVE DEAN | Printed Name | Date |
| 7. Graduate School (if appropriate) | Printed Name | Date |
| 8. University Honors Center (if appropriate) | Printed Name | Date |
| 9. Office of International Affairs (study tours only) | Printed Name | Date |
| 10. ACADEMIC AFFAIRS | Printed Name | Date |

OLD 541-2007

IMMUNOBIOLOGY
M522
M, W, F - 11:30-12:18; HM 0107

Instructor: Paula Bryant, Ph.D. Tel: 247-7694
Department of Microbiology e-mail: bryant.218@osu.edu
909 Bio Sci

Lab Coordinator: Madhura Pradhan, Ph.D. Tel: 292-1196
Department of Microbiology e-mail: pradhan.2@osu.edu
140 Riffe

RequiredText: *Kuby Immunology* by Kindt, Goldsby, and Osborne. W.H. Freeman (6th Edition);
www.whfreeman.com/immunology6e
Note: This is a brand new edition, and there are already mistakes that have been found and posted on the Kuby website. I'm sure we will find more! In addition, Chapter 3 on innate immunology is brand new, and all other chapters have been updated, some extensively. Thus, if you have old editions of Kuby, or lecture notes, exams, etc., from previous years, these will NOT be valid.

COURSE REQUIREMENTS:
MIDTERM EXAM I - 20% of grade
MIDTERM EXAM II - 20% of grade
FINAL EXAM (comprehensive) - 30% of grade
LABORATORY - 30% of grade

EXAM POLICY:

- 1.) Midterm exams will be worth 100 pts each, the comprehensive final will be worth 150 pts
- 2.) Exams are given back during the lab period, at which time Dr. Bryant will go over the answers and any questions you may have can be asked.
- 3.) **YOU WILL NOT BE ABLE TO KEEP THE EXAMS!!** The exams must be handed back to Dr. Bryant immediately following her review before she leaves the laboratory. Your grades will not be recorded until your exam is back in Dr. Bryant's possession. Any student who does not turn their exam back in will receive a 0.
- 4.) No one is allowed to copy down any questions or take notes while the exams are in their possession during the review. If caught doing so, this will be considered cheating.
- 5.) ANY STUDENT WISHING TO REVIEW HIS/HER EXAM PRIOR TO THE FINAL MAY MAKE AN APPOINTMENT WITH DR. BRYANT AND DO SO UNDER HER SUPERVISION IN HER OFFICE
- 6.) Exams are AS scheduled - NO EXCEPTIONS!!!
Those with EXCUSABLE conflicts need to inform Dr. Bryant ASAP to schedule a make-up exam. Make-up exams will be given prior to, but not after, the original exam date. In the case of an emergency, please contact Dr. Bryant before the exam.

ATTENDANCE:

Lecture attendance is STRONGLY recommended. Some lectures will contain material not found in the text book or on Carmen handouts, to benefit those in attendance.
LABORATORY ATTENDANCE IS MANDATORY!!!!

LECTURE MATERIALS:

All enrolled students should have access to Carmen and the micro522 course site. We will communicate to you as a class via this website, with any updates, handouts, exam grades, discussion questions, etc.
Lecture handouts will be posted on Carmen. Dr. Bryant will do her best to ensure they are posted prior to the lecture, however there may be an occasion where this does not happen.
Please keep in mind that providing lecture handouts and/or posting such handouts on Carmen is not required of Dr. Bryant. She provides these handouts as study tools. Thus, do not make personal requests demanding lecture handouts in advance. The following are the predicted lecture topics for the designated course dates. It is not uncommon to fall behind schedule, or for the topics to change! The midterms and final are as scheduled regardless, and they will only include the material actually covered in lecture, regardless of the syllabus.

Date:	Topic:	Kuby:
W-Jan 3	Principals of Innate versus Adaptive Immunity; Basic Signal Transduction	Ch. 1
F-Jan 5	Cells & Organs of the Immune System I	Ch. 2
M-Jan 8	Cells & Organs of the Immune System II; Innate Immunity I	Ch. 2, 3
W-Jan 10	Innate Immunity II	Ch. 3
F-Jan 12	Antibody structure and function I	Ch. 4, (6)
M-Jan 15	MLK day - NO CLASS	
W-Jan 17	Antibody structure and function II	Ch. 4, (6)
F-Jan 19	Generation of Immunoglobulin diversity I	Ch. 5
M-Jan 22	Generation of Immunoglobulin diversity II	Ch. 5
W-Jan 24	Complement	Ch. 7
F-Jan 26	MIDTERM EXAM I	
M-Jan 29	MHC Structure & Genetics	Ch. 8
W-Jan 31	Antigen Processing and Presentation	Ch. 8
F-Feb 2	The TCR	Ch. 9
M-Feb 5	T Cell maturation: Thymic Selection	Ch. 10
W-Feb 7	T cell activation, Differentiation, & Death	Ch. 10
F-Feb 9	B cell maturation	Ch. 11
M-Feb 12	B cell Activation	Ch. 11
W-Feb 14	T-B cognate interactions & the Humoral Response	Ch. 11, 12
F-Feb 16	Cytokines	Ch. 12
M-Feb 19	MIDTERM EXAM II	
W-Feb 21	Leukocyte activation & Migration I	Ch. 13
F-Feb 23	Leukocyte activation & Migration II	Ch. 13
M-Feb 26	Cell Mediated Cytotoxic Responses I	Ch. 14
W-Feb 28	Cell Mediated Cytotoxic Responses II/Hypersensitivity Reactions I	Ch. 14,15
F-Mar 2	Hypersensitivity Reactions II	Ch. 15
M-Mar 5	Tolerance and Autoimmunity I	Ch. 16
W-Mar 7	Tolerance and Autoimmunity II	Ch. 16
F-Mar 9	Vaccines	Ch. 19
Th-Mar. 15	FINAL EXAM - 11:30 a.m. -1:18 p.m.	

MICROBIOLOGY 522: IMMUNOBIOLOGY
WINTER 2007
LABORATORY SYLLABUS

NOTE: THE FOLLOWING SCHEDULE IS SUBJECT TO CHANGE.

Tue/Wed - Jan 9/10 Lab Period I:

- A. EXERCISE 1 - Antibody Purification: Part A and B
 - 1. Introduction to Antibodies - types, classes, structure, and function
 - 2. Practical uses for Antibodies in the research lab
 - 3. Purification of unknown antibodies by affinity Chromatography
 - 4. Use spectroscopic data to calculate purified antibody concentration
- B. Supplement: How to use micropipettors
 - 1. One minute video
 - 2. Handout

Thur/Fri – Jan11/ 12 Lab Period II:

- A. EXERCISE 1 - Antibody Purification: Part C
 - 1. Run Bradford Assay using a protein standard and purified unknown antibody.
 - 2. Introduction to a standard curve: Plot a standard curve using data from Bradford assay
 - 3. Use Bradford assay data to determine purified antibody concentration
- B. EXERCISE 2 - Hematopoiesis: Cells of the Blood
 - 1. Observe prestained slides of Blood cells under the microscope and identify different cell types.
- C. EXERCISE 3 - Antibody Reactions - Radial Immuno Diffusion (RID)
 - 1. Introduction to a prelab: prepare RID prelab - *due next lab period (Jan 16/17)*

Tue/Wed - Jan 16/17 Lab Period III:

- A. EXERCISE 3 - Antibody Reactions - Radial Immuno Diffusion (RID): Part A
 - 1. Turn in RID pre-Lab
 - 2. Set up RID to titer antibody purified in lab period I

- B. EXERCISE 4 - The Use of ELISA to Characterize an Antibody - Titering: Part A.1
1. Introduction to ELISA
 2. Prepare ELISA pre-lab flow chart for part A.1 and A.2-due at the end of this lab period
 3. Coat wells of 96 well plate with antigen

Thur/Fri - Jan 18/19 Lab Period IV:

- A. EXERCISE 3 - Radial Immuno Diffusion (RID): Part B
1. Measure diameter of precipitin rings. Turn in your data.
- B. EXERCISE 4 - ELISA – Titering: Part A.2
1. Add antibody purified in Lab Period I to plate wells coated with antigen in Lab Period III and run ELISA
 2. Read absorbance of your plate. Turn in your data.
- C. QUIZ 1 (Ex. 1, 2)

Tue/Wed - Jan 23/24 Lab Period V:

- A. EXERCISE 3 – RID: Part C
1. Generate a standard curve using collated data from Lab period IV to determine the concentration of unknown antibody purified in Lab Period I - due this lab period.
- B. EXERCISE 4 - ELISA – Titering: Part A.2
1. Prepare a linear plot of absorbance vs. antibody dilution and determine titer of purified unknown antibody-due this lab period
- C. EXERCISE 4 - ELISA – Specificity: Part B.1
1. Prepare ELISA Part B.1 and B.2 pre-Lab- due at the end of this lab period
 2. Coat wells of 96 well plate with antigen

Thur/Fri - Jan 25/26 Lab Period VI:

- A. EXERCISE 4 - ELISA – Specificity: Part B.2
1. Add antibody purified in Lab Period I to plate wells coated with antigen in Lab Period V and run ELISA
 2. Read absorbance of your plate. Turn in your data.

Tue/Wed - Jan 30/31 Lab Period VII:

- A. EXERCISE 4 - ELISA – Specificity: Part B
1. Prepare a linear plot of absorbance vs. antibody dilution using your group data
 1. Identify unknown antibody
 2. Discussion of Antibody specificity vs. cross-reactivity
- B. EXERCISE 5 - Immunoblotting (Western Blot): Part A
1. Load and run SDS-PAGE gels

2. Introduction to SDS-PAGE, Immunoblots and their use in the research lab
3. Western blot assembly DEMO/practice
4. Set up transfer assembly for transfer of proteins from gel to nitrocellulose
5. When transfer is complete, membranes will be placed in blocking solution for probing in Lab Period VIII.

Thur/Fri – Feb 1/2 Lab Period VIII:

- A. EXERCISE 5 - Immunoblotting: Part B
 1. Probe membranes with primary and secondary antibodies
 2. Develop via chemiluminescence
- B. EXERCISE 6 – Introduction to Tissue Culture Technique: Part A
 1. Video (20 minutes)
 2. Introduction to aseptic cell culture technique using laminar air flow hood
 3. Set up the culture of A20 cells, a mouse B cell lymphoma cell line, using RPMI 1640 medium
 4. Observe suspension vs. adherent cell cultures using inverted microscopes
 5. Stain different cell types provided to you on a slide and observe them under the microscope
- C. QUIZ 2 (Ex. 3, 4A and 4B)

Tue/Wed – Feb 6/7 Lab Period IX:

- A. EXERCISE 5 - Immunoblotting: Part B continued
 1. Discuss the results and interpret data
 2. Compare immunoblotting results with ELISA-Part B
- B. EXERCISE 6 – Introduction to Tissue Culture Technique: Part B
 1. Harvest A20 cells from the cultures set up in lab VIII
 2. Determine cell number and viability using a hemacytometer
- C. EXERCISE 7 - Lymphocyte Signal Transduction: Part A
 1. Stimulate A20 cells for various lengths of times
 2. Lyse the stimulated cells and control cells
 3. Separate lysates by SDS-PAGE
 4. Set up transfers for Western Blot analysis

Thur/Fri - Feb 8/9 Lab Period X:

- A. EXERCISE 7 - Lymphocyte Signal Transduction: Part B
 1. Probe membranes with primary and secondary antibodies
 2. Develop via chemiluminescence
 3. Interpret data
- B. QUIZ 3 (Ex. 5, 6, 7)
- C. Lecture MIDTERM I discussion

Tue/Wed - Feb 13/14 Lab Period XI:

- A. EXERCISE 8 - Role of Complement in Antibody-dependent cell lysis- Jerne Plaque Assay
 - 1. Isolation of lymphocytes from the mouse spleen-done by TA
 - 2. Determination of cell number and viability using trypan blue and a hemacytometer
 - 3. Run Jerne Plaque Assay
- B. EXERCISE 9 - Antibody Reactions - Ouchterlony
 - 1. Set up ouchterlony plates using the purified antibodies and antigens
 - 2. Discuss cross reactivity, partial identity of antigens as determined by ouchterlony technique.
 - 3. Compare data from ELISA-Part B and Immunoblotting to ouchterlony

Thur/Fri - Feb 15/16 Lab Period XII:

- A. EXERCISE 10 - Phagocytosis
 - 1. Video
 - 2. Introduction to phagocytic cells of the immune system
 - 3. Introduction to the endocytic pathway and the phagosome
 - 4. Bactericidal activity of phagocytic cells
 - 5. Infect macrophages with microbe
 - 6. Gram stain of infected macrophage
- B. EXERCISE 9 - Antibody Reactions – Ouchterlony
 - 1. Observe the plates for precipitation reactions
- C. **QUIZ 4 (Ex. 8, 9, 10)**

Tue/Wed - Feb 20/21 Lab Period XIII

- A. EXERCISE 11 - Measuring the Bactericidal Activity of macrophages: Greiss Reaction
 - 1. Production of nitric oxide – Run Greiss Reaction
 - 2. Prepare standard curve using data - *due this lab period*

Thur/Fri - Feb 22/23 Lab Period XIV:

- A. EXERCISE 12 - Viral Hemagglutination/Inhibition of Viral Hemagglutination
 - 1. Run hemagglutination assay
- B. EXERCISE 13 – Bactericidal effects of serum
- C. **Lecture MIDTERM II discussion**

Tue/Wed – Feb 27/28 Lab period XV:

- A. EXERCISE 14 - Antibody Reactions - Agglutination - Rheumatoid Factor Test
 - 1. Introduction to agglutination
 - 2. Run Rheumatoid Factor Test

- B. EXERCISE 15 - Antibody Reactions – Precipitin reaction
 - 1. Run Precipitin test
- C. QUIZ 5 (Ex. 11, 12, 13)

Thur/Fri - Mar 1/2 Lab Period XVII:

- A. EXERCISE 16 - FACS/Immunofluorescence
 - 1. Intro and DEMO
- B. Open Book QUIZ 6 (Ex. 14, 15, 16)

TAs:

Tue/Thur 8:30am-11:18am	Clint Florence (Florence.21@osu.edu) Kiley Dare (dare.6@osu.edu)
Tue/Thur 1:30pm- 4:18pm	Steve Oghumu (oghumu.1@osu.edu) Kristopher Vanzandt (vanzandt.2@osu.edu)
Wed/Fri 8:30am-11:18am	Joseph Barbi (barbi.1@osu.edu) Fatoumata Sow (sow.4@osu.edu)

Laboratory coordinator:

Dr. Madhura Pradhan
Room140, Riffe Building, 496 W. 12th Ave.
pradhan.2@osu.edu , Phone: 292-1196

GRADING

The laboratory portion of this course contributes 30% towards your final grade. The point breakdown for the lab is as follows:

Six quizzes (10 points each)	60 points
Assignments	30 points
Final Lab Practical	50 points
Lab practice points	<u>10 points</u>
TOTAL	150 points

Lab practice points (10 pts) are distributed as follows:

Attendance and completion of laboratory work	5 points
Development of proper laboratory technique	3 points
Participation in lab discussions	2 points

ATTENDANCE POLICY

Attendance in the lab is mandatory. It is not possible to make up any missed labs because of the nature of the labs offered in this course. There are total 5 points for the lab attendance and completion of laboratory work. Only one absence with a valid excuse is allowed in this course without losing any attendance points. If you miss two or more than two labs, you will lose 1 point for each missed lab. This policy applies to both excused and non-excused absences. The validity of the excuse will be decided on a case by case basis by your TA and lab coordinator.

Make up Quizzes

Make up quizzes will be offered only to those with valid excused absences. You must provide a document supporting your absence to your lab coordinator in order to arrange for a make up quiz. All make up quizzes will be offered on the last day of labs which is Mar 1st/2nd for Winter 2007.

If you have any questions/concerns or complaints regarding grading of any of the quizzes/assignments offered in this course, you must submit it in writing to your lab coordinator within two lab periods from the date the graded quiz/assignment was received.

**IMMUNOBIOLOGY
M522.01**

Instructor: Abhay Satoskar Tel: 292-3243
218 Aronoff e-mail: satoskar.2@osu.edu

Lab Coordinator: Madhura Pradhan, Ph.D. Tel: 292-1196
Department of Microbiology e-mail: pradhan.2@osu.edu
140 Riffe

RequiredText: *Kuby Immunology* by Kindt, Goldsby, and Osborne. W.H. Freeman (6th Edition);
www.whfreeman.com/immunology6e
Note: This is a brand new edition, and there are already mistakes that have been found and posted on the Kuby website. I'm sure we will find more! In addition, Chapter 3 on innate immunology is brand new, and all other chapters have been updated, some extensively. Thus, if you have old editions of Kuby, or lecture notes, exams, etc., from previous years, these will NOT be valid.

COURSE REQUIREMENTS:

MIDTERM EXAM I – 100 pts
MIDTERM EXAM II – 100 pts
FINAL EXAM (comprehensive) – 150 pts

A standard grading scale based on percent of total points earned will be used to determine the grades.

%
>= 93 = A
90-92 = A-
87-89 = B+
83-86 = B
80-82 = B-
77-79 = C+
73-76 = C
70-72 = C-
67-69 = D+
60-66 = D
<60 = E

EXAM POLICY:

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ACADEMIC MISCONDUCT

OSU has a strict code of academic misconduct that requires us to report any and all cases of suspected misconduct (e.g. cheating on an exam, plagiarism in written assignments, using an exam proxy, etc.) to the OSU Committee on Academic Misconduct for adjudication. We will adhere to this policy.

ACCOMODATION OF SPECIAL NEEDS

Any students registered with the Office of Disability Services as needing accommodation should make an appointment with the instructor to discuss those needs. Please do this within the first two weeks of the quarter. Only the course coordinator is authorized to sign ODS forms. Please fill out those parts of the proctor sheet forms that are to be completed by the student before bringing the form for signature. This will help us ensure that your individual needs will be met appropriately and fairly.

SEXUAL HARASSMENT

OSU considers sexual harassment offenses to be unacceptable behaviors that disrupt opportunities for learning. While all members of the staff involved in this course have been trained in the OSU sexual harassment policies and procedures, this is not true for all OSU students. Please report any concerns about questionable or unwanted behavior to the instructor.

Date:	Topic:	Kuby:
W-	Principals of Innate versus Adaptive Immunity; Basic Signal Transduction	Ch. 1
F-	Cells & Organs of the Immune System I	Ch. 2
M-	Cells & Organs of the Immune System II; Innate Immunity I	Ch. 2, 3
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F	B cell maturation	Ch. 11

M	B cell Activation	Ch. 11
W	T-B cognate interactions & the Humoral Response	Ch. 11, 12
F	Cytokines	Ch. 12
M	MIDTERM EXAM II	
W	Leukocyte activation & Migration I	Ch. 13
F	Leukocyte activation & Migration II	Ch. 13
M	Cell Mediated Cytotoxic Responses I	Ch. 14
W	Cell Mediated Cytotoxic Responses II/Hypersensitivity Reactions I	Ch. 14,15
F	Hypersensitivity Reactions II	Ch. 15
M	Tolerance and Autoimmunity I	Ch. 16
W	Tolerance and Autoimmunity II	Ch. 16
F	Vaccines	Ch. 19

FINAL EXAM