

Experimenting with myCourses and Cooperative Group Learning in a Biology Laboratory

Faculty Learning Community Project 2002-2003
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THE PROJECT

BACKGROUND:

As an NTID Support Team Faculty member, my primary professional responsibility is to ensure that mainstreamed hearing impaired students receive the academic support they need to be successful in RIT Biological Science courses at the BS level. I approach this charge via tutoring other instructors' content material, and addressing deficiencies in background knowledge and study skills.

In order to directly assist NTID cross-registered students in the General Biology sequence, I teach a mainstreamed lab section for this course. The course content and practical exams for all laboratory sections are determined by the laboratory coordinator. although individual lab instructors have the freedom as to how this content is taught and the format of the weekly quizzes.

My Faculty Associate was Dr. Tom Frederick, who is the Lab Coordinator for the Winter quarter, while my Student Associate was Annemarie Ross, who also acted as my Teaching Assistant for the lab.

Course chosen for project:

General Biology Laboratory (1001-206)

Course description from RIT Undergraduate Bulletin 2002-2003:

"Laboratory work to complement the lecture material of General Biology (1001-202). the experiments are designed to illustrate concepts, develop laboratory skills and techniques, and improve ability to make, record and interpret observations".

PROBLEM:

1. The Winter quarter General Biology e-lab manual is posted electronically on a web site. Although the manual has links to other sites with excellent photographs, descriptions and examples, the labs generally consist of background information and procedures without stated goals or formal report and data sheets so students have little guidance as to what is expected of them during lab. I wanted to add structure to the lab
2. RIT is moving toward having a computer component for all courses and each instructor is automatically assigned a site for each course he/she teaches. Freshmen often have little experience with accessing and using these sites. I wanted to familiarize my students with the myCourses website during their freshman year.
3. The General Biology lab is a one credit course taught in parallel with its co-requisite 3 credit lecture. Students often don't seem to realize that the two course components support one another. I wanted to help students see the connection between lab and lecture.
4. Although many of the lab exercises are individual, students are sometimes expected to work in groups of 2 to 4 on assigned parts of the lab and then share the results. Some students resist this and even at the end of the quarter, do not seem to know the person sitting next to them! I wanted to increase interaction among students.

PROPOSED SOLUTION:

1. **Add structure to the lab** by developing the myCourses website for my laboratory section with links to the on-line lab manual from the SESSIONS section. Post goals for each laboratory session with links to that session from myCourses. I will post handouts, practice worksheets that support both lecture and lab, and for specific labs, report and data sheets that will give students some structure. (This is a possible solution to problem 1)
2. **Familiarize my students with the myCourses website during their freshman year** by designing an easily navigable myCourses site. I will use the online testing section starting with extra credit questions to encourage students to access the site, although I still need to give the practical part of the quiz in lab. Navigation of myCourses site will be explained in a handout and/or via e-mail. (This is a possible solution to problem 2)

3. **Help students see the connection between lab and lecture** by encouraging students to use the time they have in lab to work on group questions and link it directly to the lecture. (This is a possible solution to problem 3)
4. **Increase interaction among students.** Based on the pre-workshop session of Lilly Conference 2002, I will adapt and incorporate Millis and Cottell's Structured Problem-Solving group method into my mainstreamed lab section. (This is a possible solution to problems 3 and 4)

CONTEXT:

On-line learning is not new but has reached a critical mass at RIT which is moving toward having a computer component for all courses and each instructor is automatically assigned a site for each course he/she teaches. As part of this project, I've attended training sessions and workshops demonstrating different ways and extent of using the myCourses sites.

Similarly, cooperative learning is not new. I attended the 2002 Lilly Conference on Teaching and Learning where a number of presenters described their methods of setting up, monitoring and leading group work. I attended the pre-conference workshop of Barbara Millis and Phillip Cottell. Their work demonstrated group work for different disciplines but nothing for a laboratory setting. I adopted some of their techniques and adapted them for the mainstreamed laboratory section I teach.

PROCEDURE:

- myCourses website:

Four major sections in the myCourses site were used; namely SYLLABUS, OUTLINE, FILES and TESTING. I explained via handout and via e-mail how to access and navigate the myCourses site. (see Appendix)

In the SYLLABUS section I posted the usual items about the course, grading system, quiz and lab practical exam dates. In addition, because this course has multiple sections, I listed the other lab instructors with their day and section number(s) along with their phone and e-mail addresses so students could contact them. (see Appendix)

Under sessions in the OUTLINE section, I made a link to the e-manual which directly linked the student to that week's lab. Once in, they could navigate the entire e-lab manual. I also posted lab goals for the particular lab session, a "what to study for next quiz" study guide, handouts and practice worksheets in this section. (see Appendix)

Quiz feedback was posted in the FILES section only. The study guides were posted in both OUTLINE and FILES sections but later only posted in the OUTLINE. This decision was based on early feedback from students when it became obvious that the OUTLINE section was being used more.

Students were encouraged to access the site by posting on-line part of quizzes in TESTING section. Quizzes were completed in 2 stages. The practical part of the quiz was completed in lab while multiple choice and True/False theory questions were posted in the TESTING section online. The first week, to encourage participation, the on-line questions were offered as extra credit to ensure that all students could access the site. The following weeks, students were given a time period during which to access and submit the online portion of their quizzes. The day and time at which the quizzes would be hidden and no longer accessible was specified. I frequently looked in the section of TESTING to find out how long it took students to complete the quizzes. I did not set a time limit because I wanted students to use their books if necessary.

- Cooperative Learning Groups:

The lab holds 24 students and they were put into groups of four, two on either side of the bench. Each group was given a colored folder with a playing card set in a pocket. They were 8s, 9s, 10s, Jacks, Queens and Kings. Students were asked to write the names of their group members on a card and replace the card in a slot in the folder. Each student took a playing card from the set provided.

I held the 4 aces from which I selected a suit. At some time during the lab, students were asked to open the folder and the person holding the suit I had selected was to be the group recorder for the questions. They were told to work as a group to answer the questions or fill in the summary chart or answer application questions on an overhead in their folder (for examples of overheads, see Appendix). The recorder was to write down the answers with the overhead marker provided in the folder. Each group had different questions, summary charts, application questions or report and data sheets depending on the lab exercise. The students were given about 10 minutes to complete the task. I extended this time if no one had finished but it is good to set a time limit to the task at hand.

At the end of that time, I picked another suit and the person in each group holding that suit was to report the group answer to the entire class. To do this, the designated reporter came to the front with his/her overhead and presented the information to the rest of the class. By then, I had passed out a paper with all the questions on the one sheet so all the students could write down the answers as they were discussed. It was encouraging to see that each reporter came willingly to the front to share his/her results with the class. The reporter for the hearing-impaired group indicated to the interpreter whether he should voice or not. It worked out very well for everyone concerned.

EVALUATION METHOD:

- Make observations during lab
- Collect student group work at the end of each laboratory session
- Survey students at intervals during the quarter to determine their ease of access to the myCourses site, how frequently they log on for updates and which sections they tend to use most
- Survey students about the perceived value of the group work at intervals during the quarter
- Ask additional open-ended questions in my end of quarter evaluation to determine the most useful myCourses section(s) and the value of the group work

TIMELINE:

- Fall quarter 2002 Develop project
- Winter quarter 2002-2003 Implement project, collect data
- Spring quarter 2002-2003 Present results of project at FLC presentation.

RESULTS SUMMARY:

(For details please consult Appendix section)

myCourses website:

The most useful myCourses sections were:

OUTLINE 100% link to e-lab manual
100% "what to study for next quiz"
95% lab objectives

TESTING 100% theory part of quiz

Cooperative Learning Groups:

Value of cooperative group activities

85% checked a 4 (4=it helps me with the lecture material) or a 5 (5=I love it, it's fun and it helps me learn)

85% checked group activity should be kept

65% wrote positive comments in the final course evaluation

CONCLUSION/DISCUSSION

MyCourses site:

Most students caught on pretty quickly to using this site but for those who had a little delay in starting, I am considering demonstrating the site with a computer in the lab. I will still provide a follow-along handout as a prompt. I would need to get a student to do this because what students see on their screens is different to what the instructor sees. The biggest hurdle is to get students to activate and use their DCE accounts regularly. Most of them already use an outside account such as aol.com and although the generally forward mail to their outside accounts, it sometimes doesn't get through.

Cooperative learning group work:

Was well received by students who found it helpful with understanding and learning both lab content and lecture material. I was very pleased with the thoughtful comments made by students in the end of quarter evaluation. Group work is not accepted by all students in the lab although I was surprised by the low numbers who gave negative feedback. I must admit, I was expecting more resistance. Annemarie's advice to start the first day was very sound because it set the expectation of group work. Students were "trained" so easily that the second week, one student group opened their folder and began working before I explained the task!

In general most students worked well together and were willing to share their answers with the rest of the class. Compared to previous classes, the level of participation was high and I was surprised that the hearing-impaired students were so willing to step forward. Our interpreter was extremely cooperative and voiced for any student who asked for reverse interpreting.

I noticed that the quality of student group work was higher than if they had done it individually. In addition, students were more motivated to read their manual and search for the answer so I was able to give shorter introductions knowing that someone in the group would be able to figure out the answer. Student feedback was very revealing and honest. One of my favorite student comments expresses the benefits of group work perfectly: *"I enjoyed the group work, b/c it forced me to put on paper & words that I knew in my head"*

FUTURE PLANS

myCourses site

- Post quiz feedback in OUTLINE section as this section is used most frequently
- Learn how to use the gradebook (suggested by several students)
- Keep the SYLLABUS section in spite of the fact it is not used much (my TA agrees because it is there should the students want to contact the Lab Coordinator or another lab instructor) It also has the grading scheme for the lab

Cooperative Learning Group work

- This was thought of as a worthwhile activity by 85% of students who said it helps with the lecture material or it helps them learn
- This was my first experience with this format and I discovered things I could improve next time e.g. vary activities, explain more clearly what to do with the passing activity
- Continue refining the group work by making each exercise clearer before do it
- Millis and Cottell's strongly suggest random grouping with rotating members. However, there is a communication problem when there are a number of deaf students in the class and only one interpreter. I have not as yet figured out how to overcome this problem but will continue to search for a compromise.
- Another problem is when a group has mistakes on their overhead. I need to find a way to interrupt a presentation gracefully without embarrassing the presenter yet still encouraging participation.
- Sometimes I overlooked a mistake until I read over the answers after class. I was able to send an e-mail to the entire class clarifying the misunderstood concept. There were a few negative comments on the final evaluation as some students found this system confusing. I need to clarify possible student misconceptions when it is presented in class rather than waiting and e-mailing corrections to students.

II REFLECTIONS

TEACHING PHILOSOPHY/METAPHOR

I am fascinated by the teaching-learning process and feel that I have made meaningful progress in this area. When I first started at NTID, students then, as now, came to me because of my content knowledge and I focused on the course content, inadvertently doing much of the work for the students. With experience I have discovered how to separate the learning process from its product so now, in addition to explaining concepts and clarifying detail, I encourage students to be more actively involved in their own learning instead of being passive recipients of information.

I used to develop comparison charts for students, now I focus on helping students pull the material together for themselves e.g. I encourage students to identify relevant parameters necessary for constructing comparison and summary material. I help students learn how to learn i.e. help them develop long term learning skills essential for professional growth and promotion after graduation.

Freshmen students who were good students in high school come to college without realizing that college and high school are two entirely different situations. In most high schools, students are expected to memorize pre-digested information whereas in college they must take notes, read the text and pull information together for themselves. Many high school students have little or no knowledge of study skills, notetaking strategies and time management. This situation, together with additional freedom, distractions and poor study habits leads students to low grades and disappointment.

I see myself as a coach, working with students to understand the material, to learn how to learn and to train them in test-taking strategies. We celebrate each small success, commiserate over disappointing results, analyze these results and move on toward improvement. I constantly encourage students to strive for success. I try to use the same strategies in the mainstreamed lab situation as I use in individual tutoring.

EXPERIENCE WORKING WITH FACULTY AND STUDENT ASSOCIATES

I met with my Faculty Associate Dr. Tom Frederick two or three times during the quarter and he gave me valuable feedback on my ideas for the project and several suggestions for improving it.

I met with my Student associate Annemarie Ross before each lab and went over the goals and procedures we would use in lab. At our first meeting, I explained that I would try some group activities if time permitted. Annemarie suggested that if I was going to use this technique, I should start the first class session the way I intended to go on. Taking her advice, I implemented the group work the very first week of class which was an excellent call. She later told me that the color of some marker pens I had put in student folders were difficult to read from the back of the class so in subsequent classes, I used only black or blue.

My Student associate was essential for this project because she gave me not only the perspective of a student but also the perspective of a hearing impaired student. For example, I asked her for feedback for my introductory "lectures" and she commented that I should get a laser pointer for the overhead as I blocked part of the screen when I stood next to the overhead. Students in the class rarely ask me to move so they can see. The following week, she said that the presentation was much better but I should hold the pointer longer on what I was emphasizing in class to give the interpreter time to catch up and for the hearing-impaired students to look at the screen. This was the first time this problem had ever been brought to my attention. Having worked for NTID for 30 years, I was rather ashamed at this observation.

FACULTY LEARNING COMMUNITY EXPERIENCE

I applied to this community because I have often felt something of an "outsider" in the College of Science because of my role as an NTID Support Team member as an educator rather than a lecturer of content. Many faculty have no teaching background and focus on the content material without much in the way of teaching strategies. I needed the stimulus of people who were interested in improving their teaching skills. I have always considered myself an educator first and a content expert second.

I had hoped to meet faculty from more colleges and initially was a little disappointed with the large size of the group, about half of whom were NTID Faculty members. However, the breadth of disciplines within the NTID group compensated for the numbers. It was one of my favorite activities to meet in a non-threatening situation with like-minded faculty and get to know enthusiastic new faculty members. In addition to developing and receiving feedback on my own project, I had the pleasure of acting as a Faculty Associate to a new faculty member in Packaging Science.

As a follow up to a discussion on disruptive students, Donna Rubin attended one of our meetings. She described the type of behavior regarded as disruptive and how to handle it. At the end, she passed out a brochure with procedures to follow together with telephone numbers of appropriate contact people. I found this session especially useful, passing on the information to the Biology Department, and suggest it be included regularly.

The final presentation of our projects was a real test of brevity! Clustering projects under themes was a good idea that worked out well. I have been thinking about the low turnout for the presentations and maybe it would be a good idea for future communities to be reminded about the FITL conference early in the winter quarter so members could plan to present there too.

LILLY CONFERENCE ON TEACHING AND LEARNING

The opportunity to attend the 2002 Lilly Conference on College Teaching was for me the highlight of the year. I was impressed by the numbers of other college instructors interested in teaching and the value this group placed on the teaching endeavor. It gave me hope that teaching is recognized by others in a college setting. Attendance at the pre-conference workshop gave me the courage to try a new approach to the teaching-learning process. It was at this workshop that I decided to include group problem-solving technique into my repertoire of teaching skills.

PERSONAL GROWTH

As an "old timer" at RIT, I was able to explore new avenues and try new approaches within the Institute. I feel refreshed in a way I have not experienced for sometime. I was also able to come to terms with a brain abscess I'd had 10 years ago by using myself as a case study in the unit on the brain.

Bibliography:

Cerbin, William. (1994) The Course Portfolio as a Tool for Continuous Improvement of Teaching and Learning. *Journal on Excellence in College Teaching*, 5(1), 95-105.

Millis, Barbara Using Groups Wisely and Well. Workshop sponsored by the Faculty Institute on Active Learning, Rochester Institute of Technology, Rochester, NY 1/16/03

Millis, Barbara J. & Cottell Jr., Philip G. *Cooperative Learning for Higher Education Faculty: American Council on Education series on Higher Education*. Publ. The Oryx Press, 1998.

Richlin, Laurie B. Identifying and Implementing The Scholarship of Teaching in *New Directions in Teaching and Learning Series Vol 86, July 2001. (Appendix B)*.

RESULTS

Result of class questionnaire 1/9/03

N=21

1. Do you use the myCourses site? If so what part(s) are most useful?
[I deliberately left this open so students would have to write down item(s)]

<u># students</u>	<u>%</u>	<u>section</u>
1	5	syllabus
3	9	notes
7	33	outline
5	24	what to know for next quiz
2	9.5	for web access (online lab manual)
6	28.5	files
5	24	view grades
21	100	quizzes

2. Are you able to access the online part of the quiz? If not, why not?

<u># students</u>	<u>%</u>	<u>response</u>
19	95	yes
1	5	"had difficulty submitting quiz but now resolved"

3. Should I continue with putting the theory part of quiz online when appropriate?

<u># students</u>	<u>%</u>	<u>response</u>
19	95	yes
1	5	" if you wish"

Result of class questionnaire 1/30/03

N=22

1. Which section(s) of myCourses do you use and how frequently?

1 = never

2 = only when I receive an e-mail telling me that something has been posted

3 = only to access the website for the GB lab manual

4 = I check the site daily to see if there are any postings

	1	2	3	4
Number of students and %				
SYLLABUS	25%	35%	25%	15%
OUTLINE				
Link to lab manual			59%	41%
Lab objectives	4.8%	9.5%	42.8%	42.8%
What to study for next quiz			57%	43%
Download handouts		14%	41%	45%
TESTING		52%	19%	29%
FILES				
What to study for the next quiz	5%	18%	59%	18%
Quiz feedback	14%	24%	48%	14%

2. I have been experimenting with group work in the lab. I would like your feedback on the worth of this activity

1 = totally worthless – I only participate because I'm forced to 5%

2 = it doesn't help me learn, but I think it helps others in my group 10%

3 = it has value although the way the instructor does it doesn't turn me on 0%

4 = it helps me with the lecture material 52%

5 = I love it, it's fun and helps me learn 33%

3. General comments/suggestions etc.

Positive comments:

"Running of labs is thorough, efficient, and clearly laid out. Feedback is detailed, handouts very helpful"

"What I have learned helped me in GB class + on the tests. Mycourses is so helpful - I can keep informed + updated + come to class prepared. Online quizzes help me to study for in class lab quizzes"

"I really learned a great deal in this lab section!"

"I like this Lab. I think it helps me learn what we study in the lecture"

Comments suggesting improvements:

"Testing → when we have taken the test, we should know what we got wrong and an explanation of why the other choices are incorrect and only one is correct"

"I enjoyed the Lab. Today (1-30-03) quiz was not fun, felt rushed + that makes me make mistakes. I don't like being rushed. Could have used pictures on overhead instead"

Most negative comment with suggestion for improvement:

"I like doing experiments w/ any lab partner, but I do not like taking such a large portion of time to answer questions when I study much better by myself after all, usually it just confuses us cause no one is quite sure, and hearing all the possible answers just makes it more difficult to remember + learn the real answers. The teacher + TA can just go around the room to see how the individuals/partners are doing what they're supposed to, and then post a summary of the data for those who want it"

SUMMARY OF RESPONSES TO END OF QUARTER EVALUATION

1. Your lab instructor experimented with group work in the lab. Please comment on the value of this activity. (22 COMMENTS)

68% positive comments
27% positive comment with caveat
5% negative comments

Examples of positive replies:

"I enjoyed the group work, b/c it forced me to put on paper & words that I knew in my head"

"I think its good because some people understand certain things better, everyone can help each other"

"It was good - got to know people and also helped understand better"

Example of positive comment with caveat

"Very helpful reinforcement of lecture material - just need to be careful of time required to leave enough time for lab work (was only a problem once)"

"sometimes felt as if our group was rushed and therefore didn't have enough time to complete overheads"

Example of negative replies:

"It should be eliminated - a waste of time"

2. Do you think this activity should be (a) kept, (b) changed OR (c) dropped? Please give a reason for your choice or suggestions for modification.

86% Keep
5% Change
9% Drop

Example of comment for keep

"Everyone needs to learn to work with other people. It's part of life, might as well start now, plus it's helpful" (a circled)

"If it works, don't fix it" (a circled)

"A, because it was effective in helping us learn the material"

"Hands on participation in a group facilitates learning"

"It makes lab more fun and less stressful" (a circled)

Example of comment for drop

"c it should be optional, for those who feel it helps them learn, but it doesn't help all of us & I didn't zone out of it it would have hurt me""I believe that many participate because they are forced to participate"

Communication skills:

1. Your Lab Instructor set up a myCourses site and sent e-mails whenever she posted something. Please comment on your use of this site making specific reference to the sections you felt were most and least useful.

Most useful section(s):

*"The outline → additional websites"
"I have found that outline (myCourses) is practical. It helps to pull my grade up"
"Very useful: Outline with supplementary material, quiz feedback, what you need to know"*

Useful: online quizzes seem like a good idea for 'open book' type questions. I actually used the link to the lab manual from here - easier than remembering the website address"

"I really liked it all, keep doing this!"

"Outline. Tests"

"Outline. What to know for next quiz."

Labs with links"

"Testing (automatic grades)

Files (what we need to know etc)

"I made use of all the sections"

"Tests. Outline. Files"

"Test, outline, files"

"test feedback. online quizzes"

*" * "*

"Outline. e-mail"

"quizzes, labs"

"review for quiz"

"What to know for next quiz"

"Outline. Files. Test"

"everything was useful"

"short study guides, reports, results and comments"

"Testing. Studying for labs & quizzes"

"Outline"

"quizzes. outline."

Least useful section(s):

"The files I never could open them"

"Graded quiz results not usually available for some reason"

Files. Messages (not used)

?

Syllabus"

n/a"

Syllabus"

many other than review for quiz"

Testing"

quiz feedback"

'outline'"

Grades"

Files"

Glenda Senior

From: <gjsnsc@ritvax.isc.rit.edu>
To: <gjsnsc@ritvax.isc.rit.edu>
Sent: Monday, December 02, 2002 12:27 PM
Subject: 1001 206.42

Hi there,

Hope you all had a great Thanksgiving Break. You are in my lab section (1001 206-42) so pls go to the mycourses.rit.edu website.

Click SYLLABUS for the course description, materials, grading policy etc
Click OUTLINE to open up the weekly sessions. Go to session 1 download & print out the following:
Lab 1 (links directly to lab #1 on GB lab website) read before lab and bring to lab
Lab 1 Objectives and questions - read before lab and bring to lab
Lab 1 sample quiz - FYI this is the type of quiz I will be giving you

If you cannot access myCourses website, then go directly to the GB lab manual on the web at <http://www.rit.edu/~gtfsbi/genbiol/gbhome992.htm> and print out lab 1. Pls read BEFORE lab on Thursday.

See you Thursday ...g. senior

(This message is associated with General Biology Lab - 1001.206.42)

<http://mycourses.rit.edu/> brings up my courses home page.
Click on Tutorial link under Student Help on left hand side of screen to access this Student User Guide



Student User Guide

INTRODUCTION

Description

myCourses is a web-based courseware application (or course management system) that allows instructors to post course related information for students and conduct courses online in a secure environment. With the use of web-based forms, faculty can create an online course in a very short period of time. No special programming skill or knowledge is required to utilize the functions of myCourses.

Summary of Courseware Features

myCourses is designed to be flexible and easy to use, accommodating different learning styles and instructional needs. A variety of features are available, which can be utilized at the discretion of the instructor. These features include:

Syllabus	The first page of the course, designed to showcase general information about the course, including study guide, learning outcomes, and specific policies. Links to regulations, resources and related courses can be placed here.
Outline	Lists the activities for each week, or Session. Click on individual sessions to view activities, requirements, assignments and other resources and materials for that specific Session.
Testing	Online assessments and surveys may be taken here.
Grade Book	Collects and manages grades for the entire class and viewable to students, if desired by the instructor.
Projects	A repository for describing group projects. These can be linked to sessions.
Lectures	Students can print lectures out separately for off-line viewing.
Files	A place to store personal work and view work posted by others.
Messages	The e-mail address book, where all participants' names and e-mails are located in one place.
Discussions	The course bulletin board, where topics are posted to be discussed online, anytime. Discussions can also be answered off-line.
Chat	Real-time distance option including a whiteboard, audio and text Chat, slide viewing, and additional functions.

Access Instructions

Access myCourses

myCourses can be accessed through any computer connected to the Internet, from any location and at any time.

myCourses is designed to be accessible from computers running either Windows or Macintosh operating systems. myCourses may be viewed by Netscape's Navigator browsers 4.0 through 4.7, or by Microsoft's Internet Explorer 4.0 or higher. myCourses is also viewable through AOL browsers 4.0 and above. We strongly suggest that you DO NOT use Internet Explorer 3.0 or Netscape 6.

How to Log In

To log in to <http://mycourses.rit.edu> you must use your RIT DCE Username and Password.

On Campus students: If you don't know your RIT DCE username and password you must go to the ITS Helpdesk (Gannett Building, 7B-1113) for assistance.

Distance Learning students: If you need help you should call (585) 475-6120, 1-800-CALL-RIT (1-800-225-5748 V/TTY) or email support@firstclass.rit.edu.

The "Course Listings" Page

After successfully logging in, you will be taken to the "Course Listings" page. This is where the courses you are registered for are listed. If you add or drop a course, it may take up to 24 hours for the changes to appear in your course list.

To enter a course, click on the course number to the left of the course title. This takes you to the syllabus page for that course.

Note: There are a few special courses where a DCE accounts are not needed. These courses will be provided with special account information and help contact.

[EDIT SYLLABUS](#) - [EDIT READINGS](#)

GENERAL BIOLOGY LABORATORY

General Course Information:

1001 206.42 General Biology Lab
1000AM to 1250PM, R
08:1273

Instructor Information::

Dr. Tom Frederick
Laboratory Coordinator
Office Address: 08-A358
Telephone Number: 475-2205
Sections 40 W 10:00am to 12:50am & 44 F 10:00am to 12:50am
E-mail: gtfsbi@rit.edu

Instructor Information::

Mrs. Glenda Senior
Laboratory Instructor
Office Address: NTID Science Support Department 08-A146
Telephone Number: 475-6195
Section 42 R 10:00am to 12:50am
E-mail: gjsnsc@rit.edu

Instructor Information::

Dr. Lei Lani Stelle
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Sections 41 W 2:00pm to 4:50pm & 85 W 6:00pm to 8:50pm
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E-mail: mikeaserla@hotmail.com

Instructor Information::

Ms. Jennifer Dashnau
Laboratory Instructor
Section F 10:00am to 12:50pm

Course Manual & Materials:

Required
Online at <http://www.rit.edu/~gtfsbi/genbiol/gbhome992.htm>
Please read the appropriate laboratory BEFORE each lab session
Safety glasses are required for some laboratories - available at Campus
Connections Bookstore

Course Description :

Laboratory work to complement the lecture material of general biology (1001-202).
The experiments are designed to illustrate concepts, develop laboratory skills and techniques,
and improve ability to make, record and interpret observations.

Co-requisite :

Co-requisite 1001-202 (General Biology Lecture)

Course Objectives:

To develop laboratory skills and techniques: and improve ability to make, record and interpret observations

PLEASE NOTE :

***** THERE ARE NO MAKEUP LABS *****

If you miss a lab, you are still responsible for knowing the material from that lab for both quizzes and the lab exam!

If you are sick and cannot attend your own lab section, please contact the instructor from another section and ask if you can do that week's lab experiment with their students. Please take that instructor's quiz and he/she will pass your quiz grade along to your lab instructor.

Your course grade depends heavily on quizzes and a single comprehensive laboratory exam. Please consult the grading scheme below for details.
















Grading:


We decided in class to change the grading system to the following:

Quizzes 60% (8 quizzes - drop lowest)

Lab practical exam 20% (cumulative exam)

Lab performance: 20% (includes attendance, attention, class participation and 3 or 4 lab reports or assignments)

OUTLINE	ASSIGNMENTS	CALENDAR	CREATE SESSION	DELETE SESSION	ORDER SESS
Legend:  = visible,  = hidden,  = edit					
Date	Session	Topic			
Dec-05-02	Lab 1	Plant Anatomy: Roots, Stems & Leaves			
Dec-12-02	Lab 2	Chloroplasts and the Light-Dependent Reactions of Photosynthesis			
Dec-19-02	Lab 3	Water Transport & Transpiration (in plants)			
Dec-26-02	BREAK	BREAK			
Jan-02-03	BREAK	BREAK			
Jan-09-03	Lab 4	Animal Tissues & Anatomical Terminology			
Jan-16-03	Lab 5	Cellular Respiration & Use of Oxygen by a Whole Animal			
Jan-23-03	Lab 6	Dissection of the Fetal Pig: Respiratory and Digestive Systems			
Jan-30-03	Lab 7	Circulatory Systems			
Feb-06-03	Lab 8	Excretion & Reproduction			
Feb-13-03	Lab 9	Nervous Control & Sensory Systems			
Feb-20-03	Lab 10	LAB PRACTICAL EXAM (covers labs 1-9)			

OUTLINE	ASSIGNMENTS	CALENDAR	CREATE SESSION	DELETE SESSION	ORDER SESS
Thursday - December 5, 2002			Lab 2		
Lab 1 Edit Session					
Topic:					
Plant Anatomy: Roots, Stems & Leaves					
Lab 1 link:					
http://www.rit.edu/~gtfsbi/genbiol/Lab%201.htm					
Files:					
File Title			Notes		
Lab #1 objectives					
Lab #1 Questions and Summary Charts					
Sample quiz					

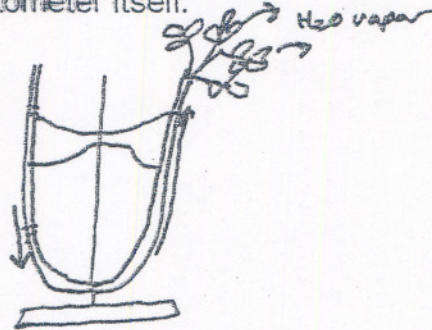
OUTLINE	ASSIGNMENTS	CALENDAR	CREATE SESSION	DELETE SESSION	ORDER SESS
Lab 2		Thursday - December 19, 2002		BREAK	
		Lab 3 Edit Session			
Topic:					
Water Transport & Transpiration (in plants)					
Lab 3 link:					
Lab 3					
Transpiration Assignment Due in Lab 1/9/03:					
<p>Print out Report and Data sheets. You can either go to the lab and check the data sheets there and/or get the data online (I will post the data). Use the data to calculate group transpiratic rates for each treatment. Transfer calculated rates to summary sheets and answer the question at the end. Please write legibly or type your answers to the questions. Hand in both sheets at the beginning of lab 4 after the Christmas break.</p>					
Files:					
File Title		Notes			
CLASS DATA Lab #3					
Lab #3 Blank Data Sheet					
What you should know for quiz #2					
Lab 3 objectives					

Expt C: TRANSPIRATION

1. Define transpiration

Evaporation of water vapor from leaves.

2. Sketch a potometer setup – show the direction of movement of water through the branch and the potometer itself.



3. Why did you have to prevent air bubbles getting into the system?

*The water behind the air will not reach the plant to be absorbed.
 & the volume will be affected.*

4. What is meant by "representative" leaf?

It is an average of the leaf sizes.

5. Why did you need to blot the leaves before setting up the branch?

So that all experiments have the same conditions initially.

6. When you calculate the surface area of your representative leaf, do you need to be concerned with both surfaces?

No

7. Explain why or why not.

*~~The surface areas are the same~~
 The stomata are only on one surface (in this plant)*

Expt C: TRANSPIRATION

8. What does Wilt-Pruf® do?

~~closes~~ stomata

blocks with waxy substance

9. Why did you only spray the lower surface of the leaves with Wilt-Pruf®?

only the lower surface has
stomata

10. Why did you put one potometer in a plastic bag?

give the effect of humidity

11. Why did you put one potometer under a fan?

give the environmental conditions
that it is windy / high evaporation

LAB #5 CELLULAR RESPIRATION

g. senior 2003

ed as: lab 5 respiration group qu split)

Aerobic respiration questions:

Group 1

1. Tri and Abe did a metabolic rate experiment with a gerbil. The gerbil weighed 12 grams. It consumed 0.95mL of oxygen in 15 minutes at 20°C. Calculate the metabolic rate (MR) of this animal. Write the formula and express the results in the correct units.

$$12g = 0.012 kg$$

$$0.95 \times 4 = 3.8 mL/hr$$

$$3.8 mL = 0.0038 L/hr$$

$$\frac{0.0038 L/hr}{0.012 kg} = 0.317 L/hr/kg$$

2. The MR of an elephant was determined at 20°C under the same conditions at the local zoo. The MR of the elephant is not comparable to that of the gerbil because:

a. the gerbil is much smaller than the elephant

b. the elephant was not in the laboratory

c. the temperature was not the same

d. none of the above are true

Can be compared for the units of MR are the same.

PRACTICE CALCULATION

A tree finch weighed 6.5g. It consumed 0.7mL of oxygen in 10mins at 20°C. Calculate the metabolic rate of the tree finch. (Write the formula and express the results in the correct units)

$$MR = \frac{LO_2/hr}{wt \text{ of animal } kg}$$

$$6.5g = 0.0065 kg$$

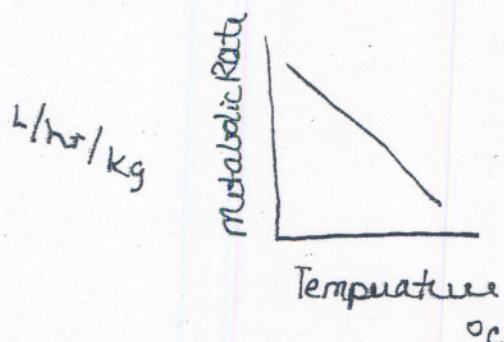
$$0.7 mL \times 6 = 4.2 mL/hr$$

$$4.2 mL = 0.0042 L/hr$$

$$\frac{0.0042 L/hr}{0.0065 kg} = 0.646 L/hr/kg$$

Application question

Make a sketch showing the metabolic rates of a mouse exposed to the following ambient (=external) temperatures: 5°C, 10°C, 20°C, 30°C, and 40°C. (Temperature goes on the independent variable axis) OR state the relationship between temperature and MR in words)



As temperature increases, metabolic rate decreases. This is an indirect relationship.

Tissue lab
Contractile tissue

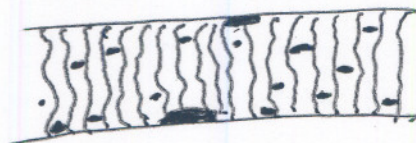
TISSUE TYPE	CHARACTERISTIC	FUNCTION	LOCATION
MUSCLE	contractile tissue	moves materials along by impulse (ex. small intestine)	visceral organs: intestines + walls of arteries
a. smooth /involuntary/visceral	spindle shaped cells with single central nucleus		
b. skeletal/voluntary /striated (run full length of organ)	long + cylindrical with fine parallel striations which run perpendicular to the long axis	allows movement	attached to bone
c. cardiac /involuntary/striated	striated; one or 2 nuclei; cardiac fibers join at intercalated disks	movement by contraction, of contents (blood) through organs	heart

Make a sketch of each muscle type:

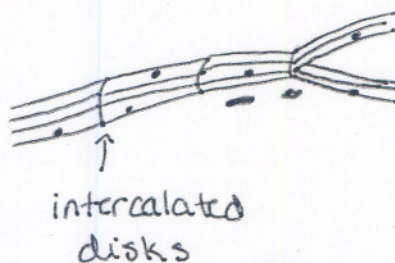
Smooth



Skeletal



Cardiac



1. Connective tissues are a group of diverse tissues that are all derived from the same embryonic tissue. Name this embryonic tissue.

Mesenchyme

2. List the 3 components that all connective tissues have?

cell, fiber, ground substance

Matrix

3. List the 5 connective tissues we will examine in order of **decreasing** matrix density:

1. Bones (most dense)
2. Hyaline cartilage
3. Areolar
4. Adipose
5. Blood (least dense)

4. Blood is classified as a connective tissue. Does blood have fibers?

Yes, they only appear when you cut yourself.

5. What are the pale colored cells in the blood slide?

Red blood cell

6. What are the stained cells in the blood slide?

Leucocytes white blood cells

7. Which are present in the largest number?

RBC

8. How do nutrients reach the osteocytes of bone?

The blood vessels

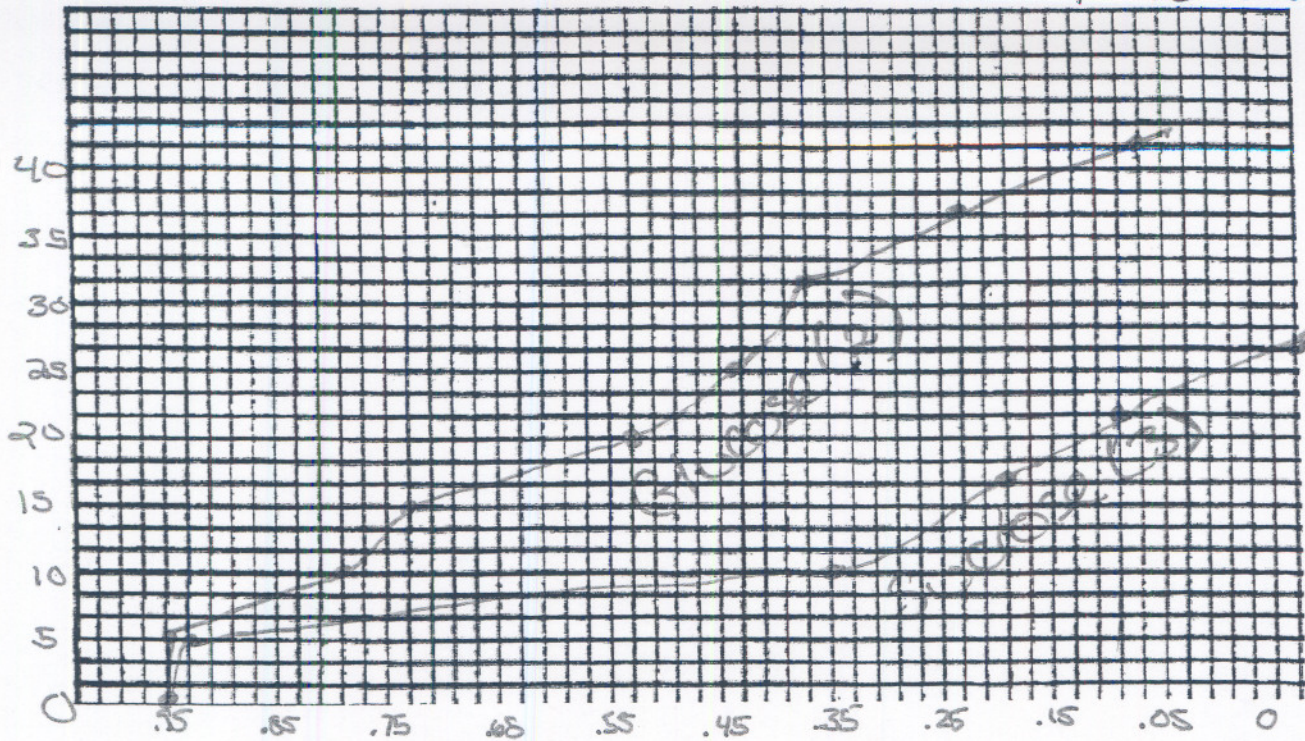
through the canaliculi

Application questions (cont):

7. The doc took a sample of tissue from the heart of a patient. He would see cells with the following characteristics:
- a. multinucleate
 - b. uninucleate - *1 or 2 nuclei*
 - c. striations - *for contractions*
 - d. intercalated discs - *cardiac fibers join here*
 - ☒ e. b, c and d are true
8. Over the Christmas break, Mrs Senior ate lots of goodies. She added to her:
- ☒ a. adipose connective tissue - *stores fat = energy*
 - b. muscle - *contractile tissue*
 - c. loose connective tissue - *fibrous tissue*
 - d. cartilage - *support tissue (nose, ear)*

Application questions (cont):

9. A lab was studying brain tissue and muscle tissue of rats. The lab technician was able to identify the brain tissue because of the presence of:
- a. striations
 - ☒ b. cell bodies
 - c. basement membranes
 - d. nuclei
10. A doc working in the ER was called to the victim of a hunting accident. A bullet had pierced the lung of the victim. Most of the tissue in this organ is:
- a. simple cuboidal epithelium
 - b. simple columnar epithelium
 - ☒ c. simple squamous epithelium



QUESTIONS

1. Which combination showed the greatest fermentation rate? Explain why it was greater than the others.

The sucrose solution has the greatest rate of fermentation because it is a disaccharide, not just a monosaccharide like the glucose.

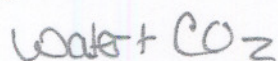
Graph does not actually show this

2. What effect did the addition of sodium fluoride have on the fermentation of glucose in tube #4? Why did this occur?

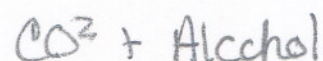
There was little or no fermentation because the sodium fluoride must be acting as an enzyme inhibitor stopping the reaction from taking place.

3. List the end products of the two pathways by which cells such as yeast break down glucose molecules.

a. aerobic respiration



b. anaerobic respiration



PRACTICE QUESTIONS – BRAIN case studies

g. senior 2003

1. An accident victim with head injuries was admitted to the neurology ward of a hospital. The man cannot see motion even though there is nothing wrong with his eyes. Which lobe of the cerebrum is most likely damaged?
 - a. temporal
 - b. occipital
 - c. parietal
 - d. frontal
 - e. cerebellum

2. Mrs. Senior had a brain abscess that caused her to lose her speech and sign language production skills although she could receive and understand speech, sign and read OK. The abscess was located in her:
 - a. Broca's area in left frontal lobe
 - b. Wernicke's area in left parietal lobe
 - c. occipital lobe
 - d. temporal lobe
 - e. cerebellum

3. A brain damaged woman loses her sense of taste. Which lobe of the cerebrum is most likely damaged?
 - a. temporal
 - b. occipital
 - c. parietal
 - d. frontal
 - e. cerebellum

4. A patient has damage to his brain that affects his ability to recognize the faces of people he knows. Where did the damage occur?
 - a. hypothalamus
 - b. temporal lobe
 - c. parietal lobe
 - d. frontal lobe
 - e. occipital lobe

5. Mrs. Senior lost the ability to write (couldn't sign checks or her credit card!) This was the result of damage to her:
- a. temporal lobe
 - b. primary motor cortex of frontal lobe
 - c. sensory area in parietal lobe
 - d. occipital lobe
 - e. cerebellum
6. A man speaks in long strings of words and nonsense syllables. This is a result of damage to his:
- a. Broca's area in left frontal lobe
 - b. Wernicke's area in left parietal lobe
 - c. occipital lobe
 - d. temporal lobe
 - e. cerebellum
7. A patient cannot feel pressure applied to her hand even though nothing is wrong with her hand. Which lobe of the cerebrum is most likely damaged?
- a. temporal
 - b. occipital
 - c. parietal
 - d. frontal
 - e. cerebellum

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