Introduction
Welcome to the Functional Genomics Research Stream of the Freshman Research Initiative! The research staff of this stream are excited to have you and welcome you to a year of productive research.

Textbook
Current Protocols Essential Laboratory Techniques
This text is quite excellent. You will find it to be an invaluable resource with respect to the background and methodology of molecular techniques that will be used by this research stream. Additionally, it will assist you in years to come as you move on to new research endeavors in settings using additional protocols not employed by this course. The curricula of the class will be based upon chapters and appendices of this text and thus it is strongly recommended that you acquire it as soon as possible. You can order it from the Amazon.com using the URL provided above. There will be a copy in the lab to be used as a reference.
Course UNIQUE Association & Enrollment

This course is comprised of four separate but related (cross-listed) UT UNIQUE course IDs.

<table>
<thead>
<tr>
<th>Course ID</th>
<th>Course Description</th>
<th>Course UNIQUE</th>
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<tbody>
<tr>
<td>BIO 205L</td>
<td>LAB EXP BIO: CELL/MOL BIO-FRI</td>
<td>48090</td>
</tr>
<tr>
<td>BIO 170C</td>
<td>CONFERENCE COURSE-FRI</td>
<td>50345</td>
</tr>
<tr>
<td>CH 204</td>
<td>INTRO TO CHEMICAL PRACT-FRI</td>
<td>51255</td>
</tr>
<tr>
<td>CH 108</td>
<td>CONFERENCE COURSE-FRI</td>
<td>52640</td>
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</tbody>
</table>

All UNIQUE IDs have been associated in both CLIPs and Blackboard to the first one listed above (BIO 170C, 50345). For this reason, when you login to Blackboard it may appear that you are enrolled in BIO 170C when you are not.

**Do not panic.** This is okay.

Do verify, however, that you are enrolled in the laboratory and conference combination of two UNIQUE IDs that you wish to receive credit for. You cannot later change which course (BIO, CH) for which you receive credit so it is important that you make the best selection for you at the beginning of this course (now).

University Core Curriculum Flags

**Quantitative Reasoning:**

This course carries the **Quantitative Reasoning flag**. Quantitative Reasoning courses are designed to equip you with skills that are necessary for understanding the types of **quantitative arguments** you will regularly encounter in your adult and professional life. You should therefore expect a **substantial portion of your grade** to come from your use of **quantitative skills to analyze real-world problems**.

* The Quantitative Reasoning flag is associated with the course CH 204.

Online Course Materials

Research is dynamic and unpredictable at times - especially when compared to a traditional science laboratory course. Timing, protocols and expectations all change in response to availability of resources and changing research objectives. Information regarding the operation of the course will be distributed in **three main ways**:

1. Course Website
   - Course Calendar
   - Research Resource Calendars
   - Results Central
2. Email
3. Blackboard

It is every student’s responsibility to **daily be in touch with Results Central, email and Blackboard** in order to keep apprised of dates, research reports and other vital communications. All important **academic announcements** will be made to Blackboard and copied to students via their official university email address. All important **research announcements** will be made to Results Central (with no email sent).
Course Website

The course website is the sole and official location of all posted resources (lectures, research meeting agendas, assignments) and research information (protocols, results). Location: http://fg.cns.utexas.edu/

The course website is the sole location where information will be posted including:

- Research Meeting Agendas
- Research Progress Reports Requirements
- Course & Research Resource Calendars
- Research Protocols
- Research Literature

Course Calendar

We now have two calendars that can be used to keep on top of activities associated with the research stream.

The course calendar is linked from the course website. All official course meetings (research meetings, extra discussion sessions, dinners, etc) will be posted on this website. Additionally, special information such as lab closures or modified hours of availability will be posted to this calendar.

Research Resource Calendars

We learned last year that our research home (PAI 2.46) can be plagued by a significant level of laboratory overcrowding and resource competition. In order to mitigate this situation we have adopted a mechanism by which we are scheduling both lab benches and certain pieces of equipment. PAI 2.46 has a Google account dedicated to this fulfillment of this scheduling requirement.

How to use the system? Go to http://www.gmail.com/ and use the username: fripai246, password: ask instructor

Click “Calendar” The following resources (below) are available for online scheduling. Highlight a single “calendar” (resource) on the left panel and then click on a time slot to sign up.
Please note the following guidelines for use of this calendaring system:

- Do NOT share the username or password or send email from the account for any reason.
- Do NOT schedule resources more than two days in advance.

**Results Central**

*Results Central* - a dynamic social-media-blog-like website that will allow all of us to contribute results and lab information in a public and up-to-the-minute fashion (linked from Course Website).

The purpose of this site is to provide a centralized location for:

- Up to the minute research results …
- General research progress discussion …
- Research Progress Reports …

The general idea is **collaboration**. I want each of you as researchers to both be up to date and keep each other up to date. In no time at all we will be engaged a variety of sub-projects, goals, successes, failures and open questions. This website will allow us to communicate results that should be known to all members of the research stream.
Student Evaluation

Overall Evaluation Standard & Grade Assignment

The relationship between what you earn during the course, the final grade I assign and the eventual credit awarded. No exceptions or adjustments will be made to final grade percentages - what you earn will determine your final grade.

<table>
<thead>
<tr>
<th>What You Earn</th>
<th>What I Assign</th>
<th>University Credit</th>
<th>What You Earn</th>
<th>What I Assign</th>
<th>University Credit</th>
</tr>
</thead>
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<tr>
<td>&gt; 93.33</td>
<td>A</td>
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<td>&gt; 70</td>
<td>C-</td>
<td>1.67</td>
</tr>
<tr>
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<tr>
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<td>B+</td>
<td>3.33</td>
<td>&gt; 63.33</td>
<td>D+</td>
<td>1.0</td>
</tr>
<tr>
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<td>B</td>
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<td>&gt; 60</td>
<td>D</td>
<td>0.67</td>
</tr>
<tr>
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<td>B-</td>
<td>2.67</td>
<td>&gt;= 56.66</td>
<td>D-</td>
<td>0.33</td>
</tr>
<tr>
<td>&gt; 76.66</td>
<td>C+</td>
<td>2.33</td>
<td>&lt; 56.66</td>
<td>F</td>
<td>0.0</td>
</tr>
<tr>
<td>&gt; 73.33</td>
<td>C</td>
<td>2.0</td>
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Research Meeting Attendance

Research meeting attendance will not be counted for a percentage of your grade. That said, we are a working group of researchers who need to communicate weekly. I do expect and will look for you to attend all research meetings. I will expect for you to be awake, connected and a part of the discussion.

Laboratory Notebooks

Your notebook will be evaluated on a regular basis and I will determine your lab notebook grade which will be counted for 20% of your total course grade.

Immediately purchase the following notebook from the University COOP or Amazon.com:

National Brand Computation Notebook (43-648)
75 sheets, 11-3/4 x 9-1/4 inches, quad-ruled (no carbon)

Research notebooks have a simple and direct purpose:
It should be a complete record of all your work.

I should be able to look through it at any time and clearly understand what you have been doing and the results you are obtaining. You will receive printed copies of your notebook evaluations so that you can improve as the semester progresses. The mentors and I will be spot-checking laboratory notebooks in your absence and I will be evaluating them during our one-on-one meetings together. Keep them up-to-date and complete at all times. See the course materials section of the course website for a complete chapter on laboratory notebook maintenance. Refer to your course textbook as well.
Always include the following items in your notebook:

- Planning (on what days you will do which procedures)
- Protocols, Procedures (print and tape if desired)
- Outcomes (did an experiment work)
- Gels / Graphs / Figures (visualization of results)
- Commentary (exposition on results obtained)
- Community Work (what you do in the lab to contribute)

**Laboratory Hours**

Laboratory hours will be counted for **20%** of your total grade.

This calculation will simply be (number of hours logged divided by number of laboratory hours required). It is currently estimated that total laboratory access for the semester will be 16 weeks. When multiplied by 6 hours per week the **estimated number of laboratory hours required is 90** (6 hours subtracted for Spring Break). You will be clearly notified if these expectations change during the course of the semester.

**Research Progress Reports**

There will be **four** total *Research Progress Reports* this semester - the sum of these reports will be counted for **60%** of your total course grade. Due dates for these reports will be clearly stated on the assignment, course website and course calendar.

*Research Progress Reports* will focus on three aspects:

- **Aspect I:** Research Fundamentals
- **Aspect II:** Research Practical Skill Assessment
- **Aspect III:** Research Progress & Productivity

**Aspect I: Research Fundamentals**

Understanding is key to the pursuit of science. It is important that our minds are prepared before our hands act. Given that each *Research Progress Report* will be engaging biological and technological concepts and methods you have likely never previously studied, a section of each report will engage a thorough understanding of the fundamentals of the topics at hand. This section of the report will often be written and will require you to read, synthesize and express the foundational concepts that underlie our training and research agenda.

**Aspect II: Research Practical Skill Assessment**

Certain skill-sets require understanding and mastery throughout the duration your time with the research stream. These skill-sets will be regularly assessed by a member of the research staff at a time and date you select (from a set of times made available to you on a weekly basis). Essentially, you learn, you prepare and then you come to use when you are ready for evaluation (but before you use the skill in a research application).

These assessments will be few in number and focused primary in the *Research Progress Reports* engaged in the first half of this semester. They are critical, however, in that they ensure proper technique throughout your research efforts.
Aspect III: Research Progress & Productivity

Your efforts in the research stream will be judged relative to fair standards of progress and productivity. Each Research Progress Report will be clear as to progress that is expected. This is relatively straight-forward during our initial phase of training. Evaluation of progress, however, becomes more difficult as you engage more difficult research-related goals and objectives (where failure is more highly probable). In this situation we will focus more on productivity.

Contributing to this score of productivity are several factors:

- **Adherence** to the Laboratory Productivity & Planning Guidelines as previously presented.
- **Productivity** as measured not by where you are in the overall process but by your commitment, focus, efficiency and overall effort. You will not be graded on experimental failure - you will be on effort.
- **Coherence** as measured by how much you understand what you are doing, why you are doing it and what might be going right or wrong at any time.

**Evaluation Summary**

The following is a summary of how your final course grade will be computed.

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Laboratory Notebooks</td>
<td>20%</td>
</tr>
<tr>
<td>Laboratory Hours</td>
<td>20%</td>
</tr>
<tr>
<td>Research Progress Reports</td>
<td>60%</td>
</tr>
</tbody>
</table>

**Research Meeting & Laboratory Expectations**

**Research Meeting Attendance Guidelines**

We will attempt to (as much as instructionally possible) use a non-lecture mode of communication - we desire one that is more intrinsically dialogic and socratic. We will adopt a lecture model that more closely resembles a laboratory research meeting and a scientific journal club. In this manner you will have the opportunity to learn to discover information through the process of discourse, disagreement and discussion. For this reason we are calling them research meetings rather than lectures.

Research meetings are officially scheduled for Tuesdays, **3:30 to 4:30 PM in WEL 2.256**.

**Laboratory Hours Guidelines**

You are required to log a minimum of **six hours** of total time in the laboratory per week.

Hours are to be recorded by using the official laboratory log. The log will be kept at the front of the lab near the glove shelves. Any forgery or dishonest manipulation of the log will be considered academic dishonesty and will be dealt with through official university policies and channels.
You are able to access the laboratory on a daily schedule provided:

- No student is EVER alone in the laboratory (significant consequences if violated).
- You are fully trained on all equipment, procedures and reagents with which you are working.

Please see a member of the research staff for details regarding the location and combination of the after-hours key.

These policies are minimal and are for your safety and the ensured continuation of involving young undergraduates in research activities. Violations will be dealt with severely and could involve significant academic consequences.

**Laboratory Productivity & Planning Guidelines**

You have a very flexible schedule by which you can fulfill you laboratory hour requirements. Please note that laboratory hours are expected to be **productive, working hours on topics relevant to stream research** and operation. This standard is expected of all students and research staff.

As a student your adherence to the guidelines presented here will play a factor in the Aspect III: Research Productivity component of your overall course evaluation (see Student Evaluation, Research Progress Reports).

Please be aware of adhere to the following guidelines with respect to laboratory activity and presence:

- Your presence in the lab should be marked by **productive work on either personal or community research**. *Contrary to prior policy, no time should be spent in the laboratory on internet surfing, homework for other classes, general waiting around, etc.*

- You should **not wait on long incubations at your bench** (even if you have reserved it for a long period). *The exception to this guideline is if you are engaged in other laboratory activities such as other experiments, sample preparations or community activities such as cleaning and reagent/media production.*

- You should **plan your time** in the laboratory. Think ahead. *I expect to see entries in your laboratory notebook that indicate that you are considering the day-to-day processes that link your research actions. Procedures are complicated and require day-to-day planning to ensure they can be completed correctly and without sample degradation or error. Think before you act.*

- **Community work** in the laboratory is **essential, required, and will be noted**. *During the spring semester it was stated that I expected to see all research stream members contributing to the community needs of the laboratory. These needs include but are not limited to cleaning, reagent and media production, inventory and acquisition of needed research materials. During the fall semester each of you has a significant time commitment to the laboratory and periods (incubations, etc) during which you have the ability to make community contributions. This is essential and will be noted during evaluations. Make laboratory notebook entries denoting your community work as a means by which you can defend your contributions.*

**Additional Issues**

**Accommodations**

Please notify the instructor at the beginning of the semester of any modification or adaptation you may require to accommodate a disability-related need. Specialized services are available on campus through Services for Students with Disabilities (471-6259).
**Academic Integrity**
Scholastic dishonesty and unethical behavior will not be tolerated. Infractions will be dealt with to the fullest extent of the academic code. Please refer to the following website for a complete discussion of such infractions and their typical consequences: [http://deanofstudents.utexas.edu/sjs/acint_student.php](http://deanofstudents.utexas.edu/sjs/acint_student.php)

**Computer Use**
Laptop computer use in research meetings is not allowed. Cell phone use is similarly not allowed (for any purpose). Exceptions will be made for note-taking. You must see me for approval and sit near the front of the lecture hall.

**Course Safety Information**
For the spring semester you are required to complete the following safety courses:

- OH 101, 201, 202

More information on these courses will be included in *Research Progress Report I*. The course materials page of the course website also contains a link to the University of Texas EHS guide for laboratory safety. Please take time to download, read and review this information prior to your work this semester.

Independent of equipment and reagents, the laboratory has general safety policies:

- Students must be supervised while working in the laboratory. If the research stream staff (mentors, faculty) are not available or in the lab, no work can be performed.
- Accidents must be immediately reported to onsite staff and to the instructor.
- Gloves must be worn at all times while working with any type of equipment or reagent.
- Closed toe shoes and long pants must be worn (as opposed to sandals and shorts) in the lab.
- No food or beverages are allowed in the laboratory at any time. They can be stored in backpacks but must never be taken out during work in the lab. Additionally, do not dispose of food waste of any kind in the lab as this too is a violation of university safety policy.
- Do not store book bags, backpacks, or any personal objects on the lab benches (always place them under desks, in drawers, or in available cabinets that have no other reagents or laboratory equipment).
- All waste (including glass, sharps, needles, caustic chemicals, and biological waste) must be discarded concordant with taught safety and disposal standards.
- All glassware and equipment must be fully cleaned immediately after use. It is very important that on a daily basis you leave the laboratory environment a small bit better than when you arrived.
- All stored reagents and tubes must be appropriately marked and dated.
- Students must immediately comply with equipment and reagent directives that come from research staff working in the laboratory environment.
- The laboratory is a professional yet informal environment. Conversation, volume, and word selection should be appropriate at all times. Respect, courtesy, and clear communication with research staff and your peers will serve you well.
- Safety policies may be amended and supplemented at any time. They will always be posted in the laboratory and should be reviewed on a regular basis.