

Course title and number	BICH 489 Genome Annotation with Ontologies
Term	Fall 2013
Meeting times and location	T 7-9pm 106 Biochemistry <a href="http://aggiemap.tamu.edu/init.asp?Bldg=1507">http://aggiemap.tamu.edu/init.asp?Bldg=1507</a>
	1CR

## Course Description and Prerequisites

Utilizing the rapid growth of genome and metagenomic sequence data requires understanding the functions genes encoded by these sequences. This course focuses on how genes and gene products are assigned annotations by genome databases. The course will involve an intensive introductory training period, followed by supervised practice of annotation and annotation evaluation in areas of interest to each student over the rest of the semester.

There are no specific course prerequisites, but you will need to be an active learner, undaunted by the challenge of digging for information and unafraid to ask questions when you get stuck.

Students will be expected to do independent work to supplement their background knowledge as needed. In addition, we will assume that students are familiar with the basic operational knowledge of computers and the internet.

## Learning Outcomes or Course Objectives

The course will cover theory and practice of functional annotation of gene products.

After completing this course students will be able to:

- Describe different levels of Genome Annotation from gene models to functional annotation to systems annotation
- Describe the use of ontologies for annotation
- Discuss the nature of gene function
- Describe different systems used for classification of genes and gene products
- Describe automated and manual approaches to annotation
- Compare models for biocuration and the challenges for each model.
- Perform literature-based annotation using Gene Ontology (GO)
- Evaluate the quality of literature-based annotations done by others in the competition

<b>Instructor Information</b>	
Name	Dr. Jim Hu, PhD
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<b>Grading Policies</b>
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**Letter graded or pass/fail. Attendance is mandatory.**

Grades will be based on:

- Attendance
- Participation in group work
- Annotations
- Challenges

1. The course will be graded on a curve with a median letter grade being somewhere in the B's as indicated in the rubrics below.
2. The synthesis of annotations and challenges is likely to be challenging.
3. There will be no opportunity to earn extra credit by doing extra work.
4. Points distribution:

Group work assessment (self, peer, coaches)	80
Attendance	20*
Annotations and Challenges	unlimited*

**Grading Scale**

A	200 or more*
B	175-199
C	150-174
D	125-149
F	<124

\* Students get 5 points for every successful (complete and correct after assessment by experienced biocurator) annotation or challenge they make, so there is theoretically no upper limit to the high score. The point range for an A is based on what we consider an outstanding effort for the number of credit hours allotted. Because of the competitive nature of CACAO, students often exceed this standard.

Important: Because annotations and challenges can be made at any time during the competition, there is no extra opportunity to make up specific missed assignments.

**Group Work Assessment: 80 Points**

Students will be graded on the assessment of his/her own participation as well as by group members and the coaches for his/her participation in group discussions.

**Attendance Policy:**

Students start with 20 points for attendance. 10 points will be deducted for each unexcused absence. Note that the final attendance score can be a negative number. Attendance policy for this class conforms to student rule 7. See: <http://student-rules.tamu.edu/rule07>

**Annotations & Challenges: 100 Points**

Each student will perform in-depth Gene Ontology annotation of genes involved in a biological process of their choice from appropriate organisms. Annotations will be evaluated based on the completeness of the annotations, the appropriate documentation of evidence, contributions to revisions to GO via new term requests or term revision requests, and biological significance. Students may enter refinements and challenges to other students' annotations to clarify, correct or complete the annotation. Challenges will be evaluated based on the logic and difficulty of the challenge. Annotations and challenges will be part of the Community Assessment of Community Annotation with Ontologies (CACAO) project, which is hosted on the Gene Ontology Normal Usage Tracking System (GONUTS) wiki (<http://gowiki.tamu.edu>).

<b>Course Topics, Calendar of Activities, Major Assignment Dates</b>		
<b>Meeting/Date</b>	<b>Topic</b>	<b>Notes</b>
Tues Aug 27	<ul style="list-style-type: none"> <li>● Introductions</li> <li>● Course organization and learning objectives</li> <li>● Set up accounts on GONUTS</li> <li>● Web resources</li> </ul>	Pre-evaluation out
Tues Sept 3	Training	
Sept 8 – Sept 15*	GO Annotation on GONUTS	CACAO round 1
Sept 15 – Sept 22	Challenges	
Sept 22 – Sept 29*	GO Annotation on GONUTS	CACAO round 2
Sept 29 – Oct 6	Challenges	
Oct 6 – Oct 13*	GO Annotation on GONUTS	CACAO round 3
Oct 13 – Oct 20	Challenges	
Oct 20 – Oct 27*	GO Annotation on GONUTS	CACAO round 4
Oct 27 – Nov 3	Challenges	
Nov 3 - 10*	GO Annotation on GONUTS	CACAO round 5
Nov 10 - 17	Challenges	
Tues Nov 19	Conclusions & discussion	
Tues Nov 26	Wrap up Broader impacts and CACAO	Post-evaluation in; self & peer assessments in

\* Students will perform independent annotation on areas of interest

<b>Other Pertinent Course Information</b>
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**COURSE ORGANIZATION:**

There is no textbook for this course. We will use online resources and the primary literature.

The course will begin with two weeks of intensive background and training in annotation theory and practice. This will be followed by real annotation activities by students and evaluation of competitive annotations by CACAO students at TAMU and elsewhere.

**COURSE REQUIREMENTS:****E-mail and computer access:**

All students are required to have an active e-mail account that can receive course announcements from Howdy. You will also need to be able to access the Internet to do class assignments, preferably with a high-speed connection, as you will need to access various Internet resources, including but not restricted to the class websites. If you have a laptop, it may be useful to bring it to class.

**Americans with Disabilities Act (ADA)**

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit <http://disability.tamu.edu>

**Make Up Policy**

The Make Up policy follows university policy and there will be NO make ups for missed classes. Students with a university excused absence will not be penalized for failing to attend the class (see attendance policy above), but should add annotations or challenges in their own time before the next class.

**Academic Integrity**

For additional information please visit: <http://www.tamu.edu/aggiehonor>

**“An Aggie does not lie, cheat, or steal, or tolerate those who do.”**

**Copyright Policy**

All materials used in this class are copyrighted. Therefore, you do not have the right to copy class materials unless permission is expressly granted in writing. These materials include but are not limited to syllabi, in-class materials, and primary literature.