



Syllabus

Course title and number	BICH 485 Community Annotation with Ontologies 1
Term	Spring 2012
Meeting times and location	T 7-9pm 106 Biochemistry http://aggiemap.tamu.edu/init.asp?Bldg=1507
	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

Instructor Information	
Name	Dr. Jim Hu, PhD
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Grading Policies

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.

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.

Course Topics, Calendar of Activities, Major Assignment Dates		
Meeting/Date	Topic	Notes
Tues Jan 17	<ul style="list-style-type: none"> ● Introductions ● Course organization and learning objectives ● Set up accounts on GONUTS ● Web resources 	
Tues Jan 24th	Training	● Pre-evaluation out
Tues Jan 31	Training	
Feb 6-12*	GO Annotation on GONUTS	CACAO round 1
Feb 13-19**	Challenges	
Feb 20-26*	GO Annotation on GONUTS	CACAO round 2
Feb 27 – Mar 4**	Challenges	
Mar 5-11*	GO Annotation on GONUTS	CACAO round 3
Mar 19-25**	Challenges	
Mar 26 – Apr 1*	GO Annotation on GONUTS	CACAO round 4
Apr 2-8**	Challenges	
Apr 9-15*	GO Annotation on GONUTS	CACAO round 5
Apr 16-22**	Challenges	
Tues April 24	Wrap up Broader impacts and CACAO	Post-evaluation in; self & peer assessments in

* Students will perform independent annotation on areas of interest

Other Pertinent Course Information

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
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.”
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Rubrics for CACAO Course:**Rubric #1: Group Work**

A - Thorough Understanding	<ul style="list-style-type: none"> i. Consistently and actively works towards group goals. ii. Is sensitive to the feelings and learning needs of all group members. iii. Willingly accepts and fulfills individual role within the group. iv. Consistently and actively contributes knowledge, opinions and skills. v. Values the knowledge, opinions and skills of all group members and encourages their contribution. vi. Helps group identify necessary changes and encourages group action for change.
B - Good Understanding	<ul style="list-style-type: none"> i. Works toward group goals without prompting. ii. Accepts and fulfills individual role within the group. iii. Contributes knowledge, opinions and skills without prompting. iv. Shows sensitivity to the feelings of others. v. Willingly participates in needed changes.
C - Satisfactory	<ul style="list-style-type: none"> i. Works toward group goals with occasional prompting. ii. Contributes to the group with occasional prompting. iii. Shows sensitivity to the feelings of others. iv. Participates in needed changes, with occasional prompting.
D - Needs Improvement	<ul style="list-style-type: none"> i. Limited understanding. ii. Works toward group goals only when prompted. iii. Contributes to the group only when prompted. iv. Needs occasional reminders to be sensitive to the feelings of others. v. Participates in needed changes when prompted and encouraged.

F - Unacceptable	i. Did not participate in group work.
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Rubric #2: Mechanics and Quality of the Annotations & Incorporation of Feedback

A - Excellent	<ul style="list-style-type: none"> i. Annotations are formatted correctly and are complete. ii. Annotations are made using the first occurrence of evidence. iii. Short descriptions show clear understanding of experimental method/evidence. iv. GO term selected is the most appropriate for the evidence cited, the evidence term is appropriate for the methods used, the reference chosen includes the actual data (not a reference to another paper or the abstract), the experiment described provides the evidence for the chosen GO term, the optional fields are also filled in correctly (if necessary). v. Upon challenges, annotation is well defended using clear logic and appropriate explanations of evidence. vi. Feedback from coaches, judges or instructors is incorporated rapidly and appropriate changes are made to annotations quickly.
B - Very Good	<ul style="list-style-type: none"> i. Annotations are formatted correctly and are complete. ii. Short descriptions show clear understanding of experimental method/evidence. iii. GO term selected is not the most appropriate, but is only a single (parent or child) relationship away from the most appropriate term. iv. Upon challenges, an annotation is defended using clear logic, but explanation lacks some detail(s). v. Feedback from coaches, judges or instructors is incorporated rapidly and appropriate changes are made to annotations quickly.
C - Satisfactory	<ul style="list-style-type: none"> i. Annotations are formatted correctly and are complete. ii. Simple explanation of evidence given. iii. GO term selected is not the most appropriate and is more than a single parent/child relationship away from the most appropriate term. iv. Upon challenges, an annotation is defended, but the explanation lacks important details. v. Feedback from coaches, judges or instructors is incorporated and appropriate changes are made to annotations with occasional prompting.
D - Needs Improvement	<ul style="list-style-type: none"> i. Annotations are incorrectly formatted, incomplete or inaccurate. ii. Annotations are made using the wrong evidence code. iii. GO term selected is not relevant to the evidence described. iv. Upon challenges, an annotation is not well defended due to a lack of understanding of evidence or annotation logic. v. Feedback from coaches, judges or instructors is incorporated and appropriate changes are made to annotations when prompted and encouraged.
F - Unacceptable	<ul style="list-style-type: none"> i. Annotations were not added to GONUTS. ii. Upon challenges, an annotation is not defended. iii. Did not incorporate feedback from coaches, judges or instructors and appropriate changes are not made to annotations.

Rubric #3: Knowledge Integration & Application Through Challenges

A - Excellent	<ul style="list-style-type: none"> i. Challenge was well-organized, comprehensive and persuasive. ii. Demonstrates full knowledge of the annotation and evidence. iii. Presents a logical explanation for the challenge. iv. Presents an easy-to-follow argument that is logical and adequately detailed.
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	v. Presents an excellent (see above rubric) for alternative annotation.
B - Very Good	<ul style="list-style-type: none"> i. Challenge is well-organized. ii. Presents most of the arguments against the annotation but lacks some details. iii. Presents a very good (see above rubric) for alternative annotation.
C - Satisfactory	<ul style="list-style-type: none"> i. Challenge is appropriate. ii. Features of the argument lack important detail or does not present sufficient logic. iii. Presents a satisfactory (see above rubric) for alternative annotation.
D - Needs Improvement	<ul style="list-style-type: none"> i. Challenge is disorganized or illogical. ii. Presents basic background to the annotation, but does not adequately describe the problem to be solved. iii. Presents a needs improvement (see above rubric) for alternative annotation.
F - Unacceptable	<ul style="list-style-type: none"> i. Challenge is vague, confusing or obviously inappropriate. ii. Argument is poorly contrived or neglects obvious problems with the annotation. iii. Does not present an alternative annotation.