CS 490R – Intelligent Systems
Course Syllabus and Calendar – Winter 2015

Professor Don Colton
Brigham Young University–Hawai'i

January 15, 2015

Certain content is required in all BYUH syllabi. Section 9 gives a convenient summary of that content.

Students may find sections 1 through 4 to be immediately beneficial as they seek to understand this class and the manner in which it will be conducted. Read those first. The remaining sections give additional depth and breadth.

Contents

1 Overview

Artificial Intelligence (AI) has been a goal of computer scientists since the earliest days of computing. It has benefited and suffered from overblown expectations. It has had seasons of high respect and great disdain. Every computer scientist needs a basic understanding of AI, including its terminology and its accomplishments.

1.1 Expected Proficiencies

As you begin this course, we assume you can program in at least one language available under Linux. We require that programs in your chosen language can be run from the command line. There will be three programming tasks that require this skill. Commonly students use either Perl, Java, or C++ for these tasks.

We assume that you are familiar with the content usually learned in an Algorithms class, including manipulation of lists, trees, and graphs, and including search (breadth first, depth first).

Some of the programming activities would benefit if you are comfortable with regular expressions.

2 Course and Faculty

2.1 Course Information

- **Title:** Intelligent Systems
- **Course Number:** CS 490R, formerly CS 440.
- **Course Description:** (from the catalog) Fundamental issues in intelligent systems, search and constraint satisfaction, knowledge representation and reasoning.
- **Prerequisites:** CS 301
- **Semester/Year:** Winter 2015
- **Semester Code:** 2151

- **Meeting Time:** TuTh 09:20 to 10:50
- **Location:** GCB 101
- **First Day of Instruction:** Tue, Jan 13
- **Last Day to Withdraw:** Tue, Mar 10
- **Last Day of Instruction:** Tue, Apr 14
- **Final Exam:** Thu, Apr 16, 10:00–12:50

2.2 Faculty Information

- **Instructor:** Don Colton
- **Office Location:** GCB 128
- **Office Hours:** MWF 14:30-15:00, TuTh 15:30-16:00.
- **Email:** doncolton2@gmail.com
- **Campus Homepage:** http://byuh.doncolton.com/ is my campus homepage. It has my calendar and links to the homepages for each of my classes.
- **Off-Campus Homepage:** http://doncolton.com/ is my off-campus homepage.

I have reserved GCB 111 on MWF from 14:30 to 15:30 (right after my CIS 101 class) and on TuTh from 15:30 to 17:00 (right after my IT 240 class) so my students (and others) can study in a lab setting and meet with me and each other. I will be there at the start of those hours, and will stay as long as students are asking me questions. I also allow the room as an Open Lab for your use either individually or in groups, for my class or for other classes.

2.3 Course Readings and Materials

- **Textbook:** http://aima.cs.berkeley.edu/ (Rental) *Artificial Intelligence, A Modern Approach, Second Edition*, by: Stuart Russell and Peter Norvig 1080 pages. ISBN: 0-13-790395-2. Prentice Hall.
- **Learning Management System:** https://dcquiz.byuh.edu/ is the learning management system for my courses.
- **Course Homepage:** http://byuh.doncolton.com/cs440/ is my course homepage. It has links to many things including the syllabus and study guide.
- **Study Guide:** http://byuh.doncolton.com/cs440/2151/sguide.pdf is the study guide for this course. It is indexed and includes a copy of almost all of this syllabus. The study guide may be updated during the semester as assignments and/or deadlines are updated.

The textbook is a department rental. The third edition has been published but we will continue to use the second edition because it is adequate for our needs. If you wish, you can purchase the second or third edition (through Amazon, for instance) and use it instead of renting the second edition.

The textbook views the AI field as having a goal to build intelligent agents. I think this framework makes it easier to understand what AI really is and is not.

If you plan to study Artificial Intelligence at graduate school, you are strongly encouraged to dig deeply into the textbook. It is excellent.

3 Calendar

R1 through R11 are readings.

Tue Jan 13	Syllabus, CP (Cond Probability)
Thu Jan 15	CP, q45 Exam (10:10 to 10:50)
Tue Jan 20	R1
Thu Jan 22	CP, q45 Exam (10:10 to 10:50)
Tue Jan 27	R2, VA (Vacuum Agent)
Thu Jan 29	VA bake off
Tue Feb 03	R3, VA
Thu Feb 05	VA bake off
Tue Feb 10	R4, VA
Thu Feb 12	VA bake off
Tue Feb 17	R5, Res (Resolution)
Thu Feb 19	Res Exam q41 (10:10 to 10:50)
Tue Feb 24	R6, Res
Thu Feb 26	Res Exam q41 (10:10 to 10:50)
Tue Mar 03	R7, WA (Wumpus Agent)
Thu Mar 05	WA bake off
Tue Mar 10	R8, WA
Tue Mar 10	Last Day To Withdraw
Thu Mar 12	WA bake off
Tue Mar 17	R9, WA
Thu Mar 19	No Class: Empower Your Dreams
Tue Mar 24	WA bake off (no readings)
Thu Mar 26	No Class: Kuhio Day
Tue Mar 31	R10, NR (Numbers Recognition)
Thu Apr 02	NR bake off
Tue Apr 07	R11, NR
Thu Apr 09	NR bake off

Tue Apr 14 NR bake off
Thu Apr 16 Final, 10:00–12:50, GCB 101

We meet 26 times including the final exam. The dates listed are not likely to change.

The Final Exam date is established by the University and is firm. It will not change unless there is a fire or a flood or something.

4 Grading

I use a 60/70/80/90 model based on 1000 points.

Based on 1000 points

930+	A	900+	A–	870+	B+
830+	B	800+	B–	770+	C+
730+	C	700+	C–	670+	D+
630+	D	600+	D–	0+	F

The 1000 points are divided up as follows:
- Attendance (26 points)
- Readings and Oral Reports (176 points)
- Exam: Conditional Probability (100 points)
- Exam: Resolution (100 points)
- Lab: Vacuum Agent (200 points)
- Lab: Wumpus Agent (200 points)
- Lab: Numbers Recognition (200 points)

4.1 CS 490R Grade Books

In my Learning Management System (DCQuiz), I keep several online grade books so you can see how your points are coming along. This lets you compare yourself with other students in the class (without seeing their names).

2151 CS 490R Overall Grade Book: This includes the totals from all the other grade books. This is where you can find your final grade at the end of the course.

2151 CS 490R (whatever) Grade Book shows your points in the (whatever) category. (whatever) is Attendance or Readings.

4.2 Attendance (26 points)

Each day in class starts with the "daily update" (DU). It is my way of reminding you of due dates and deadlines, sharing updates and news, and taking roll. It is your way of saying something anonymously to each other and to me. It must be taken in class at a classroom computer during a window of time that starts a few minutes before class and ends 2 minutes into class.

Attendance Policy: You must attend to complete the Daily Update and thereby earn the Attendance points. You must attend to give oral reports on your readings. You must attend to take the Skills Tests and thereby earn the Skills Test points. Besides that, there is no penalty for being late or lack of attendance.

2151 CS 490R Attendance Grade Book shows your attendance points, one point per day, for 26 days. You get one point for each time you do the daily update. If you arrive too late to complete the daily update, you will not receive the attendance point for that day.

Tardiness: My tardiness policy is that you should arrive in time to complete the daily update. Generally if you are on time or early, you will have time to complete the daily update before the deadline.

4.3 Readings (176 pts)

Readings (176 points): Each week for 11 weeks, two points are awarded for each ten minutes of reading, up to 16 points (80 minutes) per week.

We anticipate that you will actually spend about nine hours per week on activities related to this class, with three hours in class, maybe two hours in readings, and the other four hours in other forms of study, including taking practice tests and writing programs.

The first point is simply for reading. The second point is for making an oral report in class. As you read, you should prepare notes (talking points) about your readings. Prepare to talk for about three minutes. You can talk, for example, about what you studied, why you selected it, what you learned, and/or where you think your studies might lead you next.

For example, if you read for 50 minutes, that will earn you 5 points. If you then deliver a three-minute oral report on that reading, you will double those points.

Your study time must represent your undivided at-

tention. (You cannot claim credit for reading while also watching TV, for instance.) It can be spent skimming a large number of pages or reading carefully a small number of pages. You can choose where to read.

4.4 Skills Tests (200 pts)

http://byuh.doncolton.com/cs440/2151/sguide.pdf is a study guide that includes specific details about the tests.

Conditional Probability (100 points) q45: We will study conditional probability for about two weeks and give you three chances on three separate days to get your best score on a 40-minute, 50-question probability test. Each question is worth 2 points.

The Conditional Probability test (q45) is offered on these days and times.

Thu Jan 15	CP, q45 Exam (10:10 to 10:50)
Thu Jan 22	CP, q45 Exam (10:10 to 10:50)
Thu Apr 16	Final, 10:00–12:50, GCB 101

Resolution (100 points) q41: We will study propositional calculus resolution for about two weeks and give you three chances on three separate days to get your best score on a 40-minute, 10-question resolution test. Each question is worth 10 points.

The Resolution test (q41) is offered on these days and times.

Thu Feb 19	Res Exam q41 (10:10 to 10:50)
Thu Feb 26	Res Exam q41 (10:10 to 10:50)
Thu Apr 16	Final, 10:00–12:50, GCB 101

These skills-based tests are based on skills taught in the book and in class. Practice tests are available after each test has been introduced, or by request.

4.5 Programming Labs (600 pts)

http://byuh.doncolton.com/cs440/2151/sguide.pdf is a study guide that includes specific details about the programming assignments, including how points are earned.

Vacuum Agent (200 points): You will program a vacuum agent. It will compete with other vacuum agents at cleaning a (virtual) room. Your score will be based on your program's cleaning performance. This will be our focus for about three weeks.

Wumpus Agent (200 points): You will program a wumpus-hunting agent. It will compete with other agents. Your score will be based on your program's performance. This will be our focus for about three weeks.

Numbers Recognition (200 points): You will program a speech recognition program. It will receive phonetic transcriptions of spoken numbers and will convert them into words. You will compete with other such programs. Your score will be based on your program's performance. This will be our focus for about three weeks.

4.6 Final Exam Day

Final Exam: The final exam period will be an opportunity to retake either skills test and to get any of your programs retested.

I will calculate your final grade before final exam day, and tell you so you can decide whether to do any additional work.

Tests: If you want to take a skills test (or both of them), you must appear at the classroom at the time the final is scheduled to start. If nobody comes, I will shut down the tests.

Labs: Programming labs can be submitted in the normal way (by copying to a designated folder) and must be announced by also sending me an email. These do not require you to come to the classroom. The deadline for submitting labs is the start of the final exam period, Thu, Apr 16, 10:00–12:50.

4.7 Extra Credit

Report an error in my formal communications (the published materials I provide), so I can fix it. In this class, the materials include the following:

- The course website, parts relating to this semester.
- The course syllabus.
- The course study guide.

Each error reported can earn you extra credit. (Typos in my informal communications are all too common and do not count.)

Syllabus errors (unless they are major) will probably be fixed only in the study guide. Check there before reporting it.

5 Instructional Methods

My instructional methods match my grading plan, and I refer you to the grading section for more details. But in brief, there are four main methods that I use.

Readings: These expose students to the field of AI and require them to understand well enough to talk about what they read. See section 4.3.

Skills Tests: These expose students to some required mathematical proficiencies. See section 4.4.

Programming Activities: These require students to synthesize working programs based on knowledge we develop in class. See section 4.5.

Lecture: This happens as a side-effect of the other methods, especially your oral reports on your readings. Some days I spend the whole class period lecturing about a current topic. I review material that was assigned from the text book or study guide and do what I can to make it clear and interesting. This happens most often when I introduce a new exam or lab.

5.1 BYUH Learning Framework

I agree with the BYUH Framework for Learning. If we follow it, class will be better for everyone.

5.2 Prepare for CS 490R

Prepare: Before class, study the course material and develop a solid understanding of it. Try to construct an understanding of the big picture and how each of the ideas and concepts relate to each other. Where appropriate use study groups to improve your and others' understanding of the material.

In CS 490R: Read, practice, and program. Find interesting topics to tell or ask about.

5.3 Engage in CS 490R

Engage: When attending class actively participate in discussions and ask questions. Test your ideas out with others and be open to their ideas and insights as well. As you leave class ask yourself, "Was class better because I was there today?"

In CS 490R: Report on your readings and help us discuss the reports made by other students.

5.4 Improve at CS 490R

Improve: Reflect on learning experiences and allow them to shape you into a more complete person: be willing to change your position or perspective on a certain subject. Take new risks and seek further opportunities to learn.

In CS 490R: Read, practice, and program. Find interesting topics to tell or ask about.

5.5 Support

The major forms of support are (a) open lab, (b) study groups, and (c) tutoring.

If you still need help, please find me, even outside my posted office hours.

5.6 Office Hour / Open Lab

As mentioned above, I have reserved GCB 111 on MWF from 14:30 to 15:30 (right after my CIS 101 class) and on TuTh from 15:30 to 17:00 (right after my IT 240 class) so my students (and others) can study in a lab setting and meet with me and each other. I will be there at the start of those hours, and will stay as long as students are asking me questions. I also allow the room as an Open Lab for your use either individually or in groups, for my class or for other classes.

5.7 Study Groups

You are encouraged to form a study group. If you are smart, being in a study group will give you the opportunity to assist others. By assisting others you will be exposed to ideas and approaches (and errors)

that you might never have considered on your own. You will benefit.

One possible time for your study group to meet is during the open lab time.

If you are struggling, being in a study group will give you the opportunity to ask questions from someone that remembers what it is like to be totally new at this subject. They are more likely to understand your questions because they sat through the same classes you did, took the same tests as you did, and probably thought about the same questions that you did.

Most of us are smart some of the time, and struggling some of the time. Study groups are good.

5.8 Tutoring

For a 400-level class, tutoring basically does not exist. Your best bet is to ask about things during class. You are also welcome to bring your questions to me during office hours or outside of office hours. And other faculty may enjoy discussing your questions with you.

6 Course Policies

Subject to Change: Like all courses I teach, I will be keeping an eye out for ways this one could be improved. Changes generally take the form of opportunities for extra credit, so nobody gets hurt and some people may be helped. If I make a change to the course and it seems unfair to you, let me know and I will try to correct it. If you still think it is unfair, you can appeal to the department chair or the dean. Also, you are welcome to suggest ways you think the class could be improved.

Digital Recording by me: I may digitally record the audio of my lectures some days. This is to help me improve my teaching materials.

Digital Recording by you: Almost everyone has a smart phone these days. I assume students will freely record what goes on in class, and take pictures of what is on the white board, to aid in their studies. I simply ask that you not embarrass anyone.

6.1 Special Treatment

There are many good reasons why students request special treatment. These include, for example, illness, field trips, performances, athletic events, and special needs. Instead of dealing with these as they arise, based on my past experience, I have adopted general policies that are intended to accommodate all but the most difficult cases, and thereby avoid the need for special treatment.

6.2 Reasonable Accommodation

This section covers special needs, including qualified special needs, as well as all other requests for special treatment.

I have carefully designed each of my classes to provide what I believe to be reasonable accommodation to those with special needs. Beyond that, further accommodation is usually considered to be unreasonable but may happen in extreme cases. Please see the paragraph on "Accommodating Special Needs" below for more information.

Ample Time: Specifically, I allow ample time on tests so that a well-prepared student can typically finish each test in half of the time allowed. This gives everyone essentially double the amount of time that should normally be needed.

Exam Retakes: Each exam is given three times (sometimes more), and I keep the highest score that was earned. This handles the case of persons that are unable to attend class or function at their best on any given day.

I consider the first attempt to be routine. I consider the second and third attempts to be an accommodation for anyone that might need it. The scheduled final exam is Thu, Apr 16, 10:00–12:50. The final consists of that third opportunity to retake **any** test that was offered during the semester. If you are happy enough with your previous scores, **you can probably skip the final.**

As a side effect of this three-tries approach to tests, it is also true that any student can miss any one or two days of class for any reason without messing up their grade.

On the other hand, the retakes are limited. If you have issues every single time the test is given, I do draw the line, and I will not give additional

chances. Additional retakes are not considered to be a "reasonable" accommodation. Additional retakes or make-ups are not offered except in highly unusual circumstances.

Deadlines: These are listed in the syllabus and in the study guide.

Even though I truly believe that these methods provide reasonable accommodation for almost everyone in almost every case, you might have a highly unusual situation for which I can and should do even more. You are welcome to see me about your situation.

6.3 Communication

We communicate with each other both formally and informally.

Formal communication is official, carefully worded, and normally in writing. Formal is for anything truly important, like grades.

Informal communication is casual and impromptu. It is meant to be helpful and efficient. Reminders are informal. Emails are informal. Explanations are usually informal.

6.3.1 From Me to You, Formal

I communicate formally, in writing, through (a) the syllabus, (b) the study guide, and (c) the learning management system.

(a) Syllabus: http://byuh.doncolton.com/cs440/2151/syl.pdf is the syllabus for this course. It tells our learning objectives and how you will be graded overall. You can rely on the syllabus. After class begins, it is almost never changed except to fix major errors.

(b) Study Guide: http://byuh.doncolton.com/cs440/2151/sguide.pdf is the study guide for this course. It includes a copy of the syllabus. The study guide is updated frequently throughout the semester, as assignments are made and deadlines are established or updated.

(b1) Calendar: The study guide tells when things will happen. It contains specific due dates.

(b2) Assignments: The study guide tells what assignments have been made and how you will be graded, item by item. It provides current details and specific helps for each assignment. It provides guidance for taking the tests.

(c) DCQuiz: https://dcquiz.byuh.edu/ is my learning management system. I use it to give tests. I use it to show you my grade books.

6.3.2 From Me to You, Informal

My main informal channels to you are (a) word of mouth and (b) email.

(a) Word of Mouth, including Lecture: Class time is meant to be informative and helpful. But if I say anything truly crucial, I will also put it into the study guide.

(b) Email: My emails to you are meant to be helpful. But if I say anything truly crucial, I will also put it into the study guide. Normally I put CS 490R at the front of the subject line in each email I send.

6.3.3 From You to Me, Formal

Your formal channels to me, specifically how you turn in class work, are mainly via (a) the learning management system, (b) email, and (c) specifically requested projects.

(a) DCQuiz: To use my learning management system, you must log into it. Then, you can respond to questions I have posted. Each day there will be a "daily update". I say more on that below. Tests will also be given using DCQuiz.

(b) Email: You will use formal email messages to submit some of the programs you write and to tell me certain other things. The study guide tells how to send formal emails, including where to send them, what subject line to use, and what to put in the body of the message.

(c) Student Projects: The study guide may tell you to submit certain work in the form of a webpage or web-based program. If so, it will say specifically where to put it. I will go to that spot to grade it.

6.3.4 From You to Me, Informal

Your informal channels to me, typically how you ask questions and get assistance, are mainly face to face and by email or chat.

Face to Face: If you need help with your class work, I am happy to look at it and offer assistance. Often this happens during class or during office hours. Often I will have you put your work on your computer screen, and then I will take a look at it while we talk face to face.

Email / Chat: You can also get assistance by sending me an email or doing a chat. I will do my best to respond to it in a reasonable and helpful way. If you want something formal, use the formal rules.

If you are writing about several different things you will usually get a faster response if you break it up into several smaller emails instead of one big email. I try to respond to a whole email at once, and not just part of it. I usually answer smaller and simpler emails faster than big ones.

7 Learning Outcomes

Outcomes (sometimes called objectives) are stated at several levels: ILO, PLO, and CLO. In this section we set forward these outcomes and tell how they are aligned with one another.

7.1 ILOs: Institutional Outcomes

ILO: Institutional Learning Outcomes (ILOs) summarize the goals and outcomes for all graduates of BYUH.

Brigham Young University Institutional Learning Objectives (ILOs) Revised 24 February 2014

Graduates of Brigham Young University–Hawai'i will:

Knowledge: Have a breadth of knowledge typically gained through general education and religious educations, and will have a depth of knowledge in their particular discipline.

Inquiry: Demonstrate information literacy and critical thinking to understand, use, and evaluate evidence and sources.

Analysis: Use critical thinking to analyze arguments, solve problems, and reason quantitatively.

Communication: Communicate effectively in both written and oral form, with integrity, good logic, and appropriate evidence.

Integrity: Integrate spiritual and secular learning and behave ethically.

Stewardship: Use knowledge, reasoning, and research to take responsibility for and make wise decisions about the use of resources.

Service: Use knowledge, reasoning, and research to solve problems and serve others.

7.2 PLOs: Program Outcomes

PLO: Program Learning Outcomes (PLOs) summarize the goals and outcomes for graduates in programs for which this course is a requirement or an elective. These support the ILOs, but are more specific.

At the end of this section, we include the relevant page from the CIS Program Outcomes Matrix, dated April 2011.

The following outcomes are pursued at the levels indicated.

High: **Demonstrated at Mastery Level**
(a) An ability to apply knowledge of computing and mathematics appropriate to the discipline.

High: **Demonstrated at Mastery Level**
(b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.

High: **Demonstrated at Mastery Level**
(c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.

High: **Demonstrated at Mastery Level**
(h) Recognition of the need for and an ability to engage in continuing professional development.

High: **Demonstrated at Mastery Level**
(CS j) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.

High: **Demonstrated at Mastery Level**
(CS k) An ability to apply design and development principles in the construction of software systems of varying complexity.

CIS Department Outcomes Matrix, April 2011

Program Outcomes

(a) An ability to apply knowledge of computing and mathematics appropriate to the discipline.
(b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
(c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
(d) An ability to function effectively on teams to accomplish a common goal.
(e) An understanding of professional, ethical, legal, security and social issues and responsibilities.
(f) An ability to communicate effectively with a range of audiences.
(g) An ability to analyze the local and global impact of computing on individuals, organizations, and society.
(h) Recognition of the need for and an ability to engage in continuing professional development.
(i) An ability to use current techniques, skills, and tools necessary for computing practice.

CS Only

(j) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices. [CS]
(k) An ability to apply design and development principles in the construction of software systems of varying complexity. [CS]

IS Only

(j) An understanding of processes that support the delivery and management of information systems within a specific application environment. [IS]

IT Only

(j) An ability to use and apply current technical concepts and practices in the core information technologies. [IT]
(k) An ability to identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems. [IT]
(l) An ability to effectively integrate IT-based solutions into the user environment. [IT]
(m) An understanding of best practices and standards and their application. [IT]
(n) An ability to assist in the creation of an effective project plan. [IT]

R = Required in that program | **CSS** = CS B.S. |**CIS** = CIS B.S. | **IS** = IS B.S. | **IT** = IT B.S.
= choose at least 9 cr hrs | O = optional as a substitute | L = Introduced, M = Practiced with feedback, H = Demonstrated at the Mastery level

Course	Description	CSS	CIS	IS	IT	a	b	c	d	e	f	g	h	i	CSj	CSk	ISj	ITj	ITk	ITl	ITm	ITn
CIS 100	Fundamentals of Info. Systems & Tech.			R	R	L	L	L	L	L	L	L	L	L			L	L	L			
CIS 101	Beginning Programming	R	R	R	R	L	L							L	L	L						
CIS 202	Object-Oriented Programming	R	R	R	R	M	M	M		L			L	M	L	L		M	L		L	L
CIS 205	Discrete Mathematics I	R	R	R	R	M	M	L	L					M	M	M						
CIS 206	Discrete Mathematics II	R	R	R		M	M	L	L					M	M	M						
CIS 305	Systems Engineering I	R	R	R	R	M	M	M	M	L	L	M	L	M	L	L	M	L	H	L	H	M
CIS 401	Web Application Development	R		R	R	M	L	L						M			L	M	L	L		
CIS 405	Systems Engineering II	R	R	R	R	M	M	M	M	L	M	M	M	M	M	M	M	M	H	M	H	M
CIS 470	Ethics in Computer & Info. Sciences	R	R	R	R		L	L	M	H	H	H	H									
CS 203	Object-Oriented Programming II	R				M	M	M						M	M	M						
CS 210	Computer Organization	R			R	H	M	L							M	L		M				
CS 301	Algorithms & Complexity	R				L	M	L	L		M		L	M	H							
CS 320	Computational Theory	R				H	M			L		L	M		H	M						
CS 415	Operating Systems Design	R				H	H	H		M	M	M	H	H	H	H					M	
CS 420	Programming Languages	R				H	H	H		M	M	M	H	H	H	H						
CS 490R	Adv Topics in Computer Science (6 CR)	R				H	H	H					H		H	H						
IS 330	Management Information Systems					L	L		M	L	M	L	L	L			L					
IS 350	Database Management Systems	R	R	R	R	M	L	M	M	L	L	L	L	M	M	L	L	H	L			
IS 430	ITS – Enterprise Resource Planning			R			L	M	M	M	M	M	M	H			H		L		M	
IS 435	Advanced Concepts ERP Systems					H	H		H	L	M	M	M	H			H			L	H	
IS 485	Project Management & Practice			R		M	H	M	H	M	H	M	H	M	M	H	H	M				H
IT 220	Linux Essentials				R	M								M				M				
IT 224	Computer Hardware & Systems Software			R	R	M	H	L	M	L	M	L	L	L				M	M	L	L	
IT 240	Fund. Of Web Design & Technology			R	R	L	L	L		M	H	M		M		L	L	M	M	M	L	
IT 280	Data Comm. Systems & Networks	R	R	R	R	M	M	M		M	M		L	M				M	L	L		
IT 420	Linux System Administration				R	H	H	M						H				M	M	M		
IT 426	Computer Network Services				R	H	H	M	L	L	L	L	L	M				H	M	M	M	L
IT 440	Foundations of HCI				R	M	H	H	M	H	M	H	M	M			H	M	H	H	H	M
IT 480	Computer Network Design				R	H	H	H					L, M	H				M	M	M		M
IT 481	Information Assurance & Security				R		L	L		L	L	L	L	M				M	M	L	M	L
Math 112	Calculus I	O		R	#																	
Math 113	Calculus II	O			#																	
Math 119	Applied Calculus	R	O	O	#																	
Math 214	Mulitvariable Calculus				#																	

7.3 CLOs: Course Outcomes

CLO: Course Learning Outcomes (CLOs, also called Student Learning Outcomes, or SLOs) summarize the goals and outcomes for students who successfully complete this course. These support the PLOs, but are more specific.

In this class we will gain the basic understanding of AI that is needed by every computer scientist. We will write several programs that utilize AI technology.

Course Goals and Student Learning Outcomes are as follows. By the conclusion of this course, students will do the following.

1. Explain fundamental issues in intelligent systems.
2. Explain search in terms of problem space and goal state.
3. Correctly perform propositional calculus resolution.
4. Correctly perform conditional probability calculations.
5. Explain and use Bayes theorem.
6. Construct and test intelligent agents in several settings.
7. Use a corpus to develop a speech recognition program.
8. Defend the need for having established corpora for speech.

8 General Topics

All syllabi are encouraged or required to address certain topics. These are generally considered to be common sense, but we find that it is useful to mention them explicitly anyway.

8.1 Academic Integrity

8.1.1 Applicable Actions

http://honorcode.byuh.edu/ details the university honor code. In the section entitled "Applicable Actions" the following are listed.

Examples of possible actions include but are not limited to the following, for instructors, programs, departments, and colleges:
• Reprimanding the student orally or in writing.
• Requiring work affected by the academic dishonesty to be redone.
• Administering a lower or failing grade on the affected assignment, test, or course.
• Removing the student from the course.
• Recommending probation, suspension, or dismissal.

Depending on the specifics of the offense, any of these responses may be possible.

Cheating on exams is the most common form of dishonesty that I normally encounter. Normally this happens when students bring in notes that include answers to past exam questions. I approve the studying of past exams, and bringing in of "memories" based on study, but not the access to written notes, including notes retrieved from other exams or stored on cell phones or other devices. Any such activity, if caught, can result in failure of the entire course.

Cheating on activities is almost impossible to detect because I allow students to collaborate and assist each other. Copy and paste is not allowed, but it is difficult to detect and prove, so I normally do not bother. You should try to understand the work you submit because it helps you prepare for the exams and future courses.

8.1.2 Plagiarism

We learn by watching others and then doing something similar.

Plagiarism: Sometimes it is said that plagiarism is copying from one person, and research is "copying" from lots of people.

When you are having trouble with an assignment, I encourage you to look at not just one, but many examples of work done by others. Study the examples. See what you can learn from them. Do not automatically trust that they are right. They may be wrong.

Do not just copy. Do your own work. When I review computer code, sometimes I see quirky ways of doing things. They appear to work even though they may be wrong. And then I see someone else that has done

it exactly the same wrong way. This does not feel like "doing your own work." Cut and paste is pretty much an honor code violation. Read and learn is totally okay. Copying other ideas is okay. I don't want to see any cut and paste.

http://en.wikipedia.org/wiki/Plagiarism has a wonderful article on plagiarism. Read it if you are not familiar with the term. Essentially, plagiarism is when you present the intellectual work of other people as though it were your own. This may happen by cut-and-paste from a website, or by group work on homework. In some cases, plagiarism may also create a violation of copyright law. If you borrow wording from someone else, identify the source.

Intentional plagiarism is a form of intellectual theft that violates widely recognized principles of academic integrity as well as the Honor Code. Such plagiarism may subject the student to appropriate disciplinary action administered through the university Honor Code Office, in addition to academic sanctions that may be applied by an instructor.

Inadvertent plagiarism, whereas not in violation of the Honor Code, is nevertheless a form of intellectual carelessness that is unacceptable in the academic community. Plagiarism of any kind is completely contrary to the established practices of higher education, where all members of the university are expected to acknowledge the original intellectual work of others that is included in one's own work.

CS 490R: In this course group work is permitted and encouraged but you are not allowed to turn in work that is beyond your understanding, whether you give proper attribution or not. Make sure you understand what you are submitting and why each line is there.

CS 490R: On exams you are required to work from personal memory, using only the resources that are normally present on your computer. This means the exams are closed book and closed notes. However, you are nearly always allowed (and encouraged!) to test your program by actually running it on the computer where you are sitting. Students caught cheating on the final exam may receive a grade of F for the semester, no matter how many points they may have earned, and they will be reported to the Honor Code office.

Faculty are responsible to establish and communicate to students their expectations of behavior with respect to academic honesty and student conduct in the course. Observations and reports of academic dishonesty shall be investigated by the instructor, who will determine and take appropriate action, and report to the Honor Code Office the final disposition of any incident of academic dishonesty by completing an Academic Dishonesty Student Violation Report. If the incident of academic dishonesty involves the violation of a public law, e.g., breaking and entering into an office or stealing an examination, the act should also be reported to University Police. If an affected student disagrees with the determination or action and is unable to resolve the matter to the mutual satisfaction of the student and the instructor, the student may have the matter reviewed through the university's grievance process.

8.2 Sexual Misconduct

Sexual Harassment is unwelcome speech or conduct of a sexual nature and includes unwelcome sexual advances, requests for sexual favors, and other verbal, nonverbal, or physical conduct. Conduct is unwelcome if the individual toward whom it is directed did not request or invite it and regarded the conduct as undesirable or offensive.

Brigham Young University–Hawai'i is committed to a policy of nondiscrimination on the basis of race, color, sex (including pregnancy), religion, national origin, ancestry, age, disability, genetic information, or veteran status in admissions, employment, or in any of its educational programs or activities.

University policy and Title IX of the Education Amendments of 1972 prohibits sexual harassment and other forms of sex discrimination against any participant in an educational program or activity at BYUH, including student-to-student sexual harassment.

The following individual has been designated to handle reports of sexual harassment and other inquiries regarding BYUH compliance with Title IX:

```
Debbie Hippolite-Wright
Title IX Coordinator
Vice President, Student Development & Life
Lorenzo Snow Administration Building
55-220 Kulanui Street
Laie, Hawaii 96762
Office Phone: 808-675-4819
```

```
E-Mail: debbie.hippolite.wright@byuh.edu
Sexual Harassment Hotline: 808-780-8875
```

BYUH's Office of Honor upholds a standard which states that parties can only engage in sexual activity freely within the legal bonds of marriage between a man and a woman. Consensual sexual activity outside the bonds of marriage is against the Honor Code and may result in probation, suspension, or dismissal from the University.

8.3 Dress and Grooming Standards

The dress and grooming of both men and women should always be modest, neat and clean, consistent with the dignity adherent to representing The Church of Jesus Christ of Latter-day Saints and any of its institutions of higher learning. Modesty and cleanliness are important values that reflect personal dignity and integrity, through which students, staff, and faculty represent the principles and standards of the Church. Members of the BYUH community commit themselves to observe these standards, which reflect the direction given by the Board of Trustees and the Church publication, "For the Strength of Youth." The Dress and Grooming Standards are as follows:

Men. A clean and neat appearance should be maintained. Shorts must cover the knee. Hair should be clean and neat, avoiding extreme styles or colors, and trimmed above the collar leaving the ear uncovered. Sideburns should not extend below the earlobe. If worn, moustaches should be neatly trimmed and may not extend beyond or below the corners of mouth. Men are expected to be clean shaven and beards are not acceptable. (If you have an exception, notify the instructor.) Earrings and other body piercing are not acceptable. For safety, footwear must be worn in all public places.

Women. A modest, clean and neat appearance should be maintained. Clothing is inappropriate when it is sleeveless, strapless, backless, or revealing, has slits above the knee, or is form fitting. Dresses, skirts, and shorts must cover the knee. Hairstyles should be clean and neat, avoiding extremes in styles and color. Excessive ear piercing and all other body piercing are not appropriate. For safety, footwear must be worn in all public places.

8.4 Accommodating Special Needs

Brigham Young University–Hawai'i is committed to providing a working and learning atmosphere, which reasonably accommodates qualified persons with disabilities. If you have a disability and need accommodations, you may wish to self-identify by contacting:

```
Services for Students with Special Needs
McKay 181
Phone: 808-675-3518 or 808-675-3999
Email address: aunal@byuh.edu
```

The Coordinator for Students with Special Needs is Leilani A'una.

Students with disabilities who are registered with the Special Needs Services should schedule an appointment with the instructor to discuss accommodations. If the student does not initiate this meeting, it is assumed no accommodations or modifications will be necessary to meet the requirements of this course. After registering with Services for Students with Special Needs, and with permission of the student, Letters of Accommodation will be sent to instructors.

If you need assistance or if you feel you have been unlawfully discriminated against on the basis of disability, you may seek resolution through established grievance policy and procedures. You should contact the Human Resource Services at 808-780-8875.

9 Syllabus Summary

Brigham Young University–Hawai'i has adopted certain requirements relating to the information that must be provided in syllabi. This section lists those requirements and for each item either provides the information directly or gives a link to where it is provided above.

Course Information: See section 2.1.
- **Title:** Intelligent Systems
- **Number:** CS 490R
- **Semester/Year:** Winter 2015
- **Credits:** 3
- **Prerequisites:** CS 301
- **Location:** GCB 101
- **Meeting Time:** TuTh 09:20 to 10:50

Faculty Information: See section 2.2.
- **Name:** Don Colton
- **Office Location:** GCB 128
- **Office Hours:** MWF 14:30-15:00, TuTh 15:30-16:00.
- **Telephone:** 808-675-3478
- **Email:** doncolton2@gmail.com

Course Readings/Materials: See section 2.3 for a list of textbooks, supplementary readings, and supplies required.

Course Description: See section 2.1.

Expected Proficiencies:
See section 1.1 for the proficiencies you should have before undertaking the course.

Course Goals and Student Learning Outcomes, including Alignment to Program (PLOs) and Institutional (ILOs) Learning Outcomes, and extent of coverage.

See section 7 for learning outcomes, showing the content of the course and how it fits into the broader curriculum. A listing of the departmental learning outcomes is provided together with the ratings taken from department's matrix assessment document representing the degree to which the course addresses each outcome.

Instructional Methods: See section 5.

Learning Management System:
`https://dcquiz.byuh.edu/` is the learning management system for my courses.

Framework for Student Learning:
See section 5.1 for a discussion of the student learning framework and how I use it.

Course Calendar: See section 3 for the calendar in general.

Here are some items of particular interest:
- **First Day of Instruction:** Tue, Jan 13
- **Last Day to Withdraw:** Tue, Mar 10
- **Last Day of Instruction:** Tue, Apr 14
- **Final Exam:** Thu, Apr 16, 10:00–12:50
- **Final Exam Location:** GCB 101

Course Policies: See section 6.
- **Attendance:** See section 4.2.
- **Tardiness:** See section 4.2.
- **Class Participation:** See section 5.3.
- **Make-Up Exams:** See section 6.2.
- **Plagiarism:** See section 8.1.2.
- **Academic Integrity:** See section 8.1.

Evaluation (Grading): See section 4.

Academic Honesty: See section 8.1.

Sexual Harassment and Misconduct: See section 8.2.

Grievances: The university grievance policy states that the policies listed on the syllabus can act as a contract and will be considered if a student complains about the faculty.

Services for Students with Special Needs: See section 8.4.