

# BMI 831 Cognitive Science for sBrain-Mind Research

A Distance Learning Course

May 29 - June 16, 2017

<http://www.brain-mind-institute.org/>

Brain-Mind Institute (BMI)

3 credits

Available via Internet

A survey of subjects of cognitive science, emphasizing learning and memory. Principles of animal learning and behavior, including habituation, sensitization, classical conditioning, instrumental conditioning, extinction, blocking, rehearsal, transfer, serial pattern learning, chunking, and language comprehension.

**Lectures:** Each lecture (video and PowerPoint) is available online hopefully by 8:00am Beijing Time, Monday to Friday, via Internet. Unfortunately, Google is currently not available from China. Lecture video files and slide files will be available at Baidu Cloud [pan.baidu.com](http://pan.baidu.com). You will receive email for sharing the files, but the files are for your eyes only as they are copyright protected. Some lectures will mention the models taught at BMI 871, but treat them as a preview only if you have not taken BMI 871.

**Instructor:** Juyang (John) Weng

**Course web:** <http://www.brain-mind-institute.org/bmi-831.html>

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**Prerequisites:** An admission to a bachelor degree in any discipline is generally sufficient. Physical science and social science applicants are all encouraged. This course is self-contained for the course homework assignments and exams.

**Required text:** Mark A. Gluck, Eduardo Mercado, and Catherine Myers, *Learning and Memory: From Brain to Behavior*, ISBN: 978-1429240147, Worth Publishers, New York, 2013.

Not required: a newer edition from the same authors: Mark A. Gluck, Eduardo Mercado, and Catherine Myers, *Learning and Memory*, 3rd Edition, ISBN: 978-1464105937, Feb 15, 2016. The electronic version is at <https://www.vitalsource.com/referral?term=9781319029296>.

**Homework:** There will be online homework assignments, administered through LON-CAPA, an integrated system for online learning and assessment, at <http://s10.lite.msu.edu>. All homework assignments will be due before the exam of the week, but a same-day completion is highly encouraged to catch up the following lecture. No late work will be accepted.

**Piazza Discussion Forum** We will use Piazza for a discussion and notification forum for this class. The web site is at <https://piazza.com/brain-mind-institute>. You will receive an invitation to join Piazza in the first week of class. The instructor will monitor Piazza and may choose to respond to questions posted to it; other students may also do so. If you have a question, you will often find that it has already been asked and answered on Piazza so check. Important class notifications will be sent via Piazza. Be sure that you accept the invitation to join. If you do not receive an invitation to join in the first week of class contact the instructor. However, Piazza is not always effective for asking last-minute technical questions.

**Quizzes:** Quizzes are short multiple-choice problems to be completed during each lecture, as your interactive participation of the lectures. You are encouraged to try your responses to quizzes but your quiz responses are not graded. A few quizzes are related to the brain model taught in BMI 871, but take the corresponding material as interactive learning, not as a test on your understanding of the BMI 871 models.

**Exams:** Three exams, to be done on each Friday, of 1.5 hours each, but the lecture material of the same Friday, which is often relatively shorter, is not included. Exams are closed book and must be done within the specific time length. In addition to watching lecture video, reading textbook and doing homework are also very important for doing well in the exams.

**Exam proctor:** You need to identify a keep-an-eye-on-you exam proctor who is a licensed librarian, one of your parents, or a licensed teacher. Send the proctor's name, address, email address, and proof of qualification required above to the instructor via email. Grading results of the exams are private and confidential, not known to the proctor. Ask the proctor to send a statement via email, at least 24 hours before the corresponding exam, with email subject "BMI 831 Proctor Statement for First-Name Last-Name " to the instructor: "I guarantee to observe the responsibilities of the proctor, including the closed-book, no-access-to-electronics, and the exam time length requirements." The proctor is responsible for printing the exam and the answer sheet before the exam and, within 1.5 hours after giving you the exam, taking a picture of your answer sheet and sending it back via email.

**Grading:** Homework: 40%. 3 exams equally weighted, each counted as 20%. Pass: the total score is 60% or above. Those who successfully pass will receive a BMI 831 Certificate and their names will be proudly listed in BMI web's page Classes.

## Course Schedule

The following chapter numbers are based on the 2nd edition of the textbook.

- Week 1, Day 1, Monday: Chapter 1 The Psychology of Learning and Memory
- Week 1, Day 2, Tuesday: Chapter 2 The Neuroscience of Learning and Memory
- Week 1, Day 3, Wednesday: Chapter 3 Habituation, Sensitization, and Familiarization: Learning about Repeated Events (I)
- Week 1, Day 4, Thursday: Chapter 3 Habituation, Sensitization, and Familiarization: Learning about Repeated Events (II)
- Week 1, Day 5, Friday: Chapter 4 Classical Conditioning: Learning to Predict Important Events
- Week 2, Day 6, Monday: Chapter 5 Operant Conditioning: Learning the Outcome of Behaviors
- Week 2, Day 7, Tuesday: Chapter 6 Generalization and Discrimination Learning (I)
- Week 2, Day 8, Wednesday: Chapter 6 Generalization and Discrimination Learning (II)

- Week 2, Day 9, Thursday: Chapter 7 Episodic and Semantic Memory: Memory for Facts and Events
- Week 2, Day 10, Friday: Chapter 8 Skill Memory: Learning by Doing
- Week 3, Day 11, Monday: Chapter 9 Working Memory and Cognitive Control
- Week 3, Day 12, Tuesday: Chapter 10 Emotional Influences on Learning and Memory
- Week 3, Day 13, Wednesday: Chapter 11 Social Learning and Memory: Observing, Interacting, and Reenacting
- Week 3, Day 14, Thursday: Chapter 12 Development and Aging: Learning and Memory across the Lifespan (I)
- Week 3, Day 15, Friday: Chapter 12 Development and Aging: Learning and Memory across the Lifespan (II)

### Schedule for Dues

All the items below are in the North American Eastern Daylight Time (EDT).

Table 1: Homework and Exams

| Week | Day | Assignment           | Due         | Answers Open           |
|------|-----|----------------------|-------------|------------------------|
| 1    | 1   | Homework 1.1         | End of Tue. | Start of Wed.          |
|      | 2   | Homework 1.2         | End of Wed. | Start of Thu.          |
|      | 3   | Homework 1.3         | End of Thu. | Start of Fri.          |
|      | 4   | Homework 1.4         | End of Fri. | Start of Sat.          |
|      | 5   | Homework 1.5         | End of Sat. | Start of Sun.          |
|      | 7   | Exam 1 (open 8:00am) | 10:00am     | Start of the next Mon. |
| 2    | 1   | Homework 2.1         | End of Tue. | Start of Wed.          |
|      | 2   | Homework 2.2         | End of Wed. | Start of Thu.          |
|      | 3   | Homework 2.3         | End of Thu. | Start of Fri.          |
|      | 4   | Homework 2.4         | End of Fri. | Start of Sat.          |
|      | 5   | Homework 2.5         | End of Sat. | Start of Sun.          |
|      | 7   | Exam 2 (open 8:00am) | 10:00am     | Start of the next Mon. |
| 3    | 1   | Homework 3.1         | End of Tue. | Start of Wed.          |
|      | 2   | Homework 3.2         | End of Wed. | Start of Thu.          |
|      | 3   | Homework 3.3         | End of Thu. | Start of Fri.          |
|      | 4   | Homework 3.4         | End of Fri. | Start of Sat.          |
|      | 5   | Homework 3.5         | End of Sat. | Start of Sun.          |
|      | 7   | Exam 3 (open 8:00am) | 10:00am     | Start of the next Mon. |