AUD 840
Auditory Evoked Potentials II
Fall 2015
Mondays 1:00 – 2:40 p.m.

Instructor:
1. Laura Dreisbach, Ph.D., CCC-A
2. Speech, Language, Hearing Sciences SLHS 231
3. Phone # (619) 594-4177
4. Email: ldreisba@mail.sdsu.edu

Office Hours:
Mondays 10:00–12:00; email for an appointment

Required Text:

Additional Readings:
Required readings accompany each topic and should be read prior to class. These articles will be available on the blackboard site for this course or from the instructor.

Course Description:
This course will provide students with advanced information pertaining to the theoretical and clinical aspects of auditory evoked potentials. Topics include vestibular differential diagnosis, evoked otoacoustic emissions (distortion-product, transient evoked, and stimulus frequency), electrocochleography, bone and horizontal evoked potential recordings, middle latency responses, auditory steady state responses, auditory event-related potentials (MMN), auditory late responses, CHAMP, stacked auditory brainstem responses, VIIth nerve recordings, and neuroimaging techniques. See course competencies below for more details.

Course Requirements:

Table 1: Course Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Grade Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm Exam</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20%</td>
</tr>
<tr>
<td>Presentation of assigned topic area</td>
<td>40%</td>
</tr>
<tr>
<td>Posting of comments to assigned topics</td>
<td>10%</td>
</tr>
<tr>
<td>Participation in discussions pertaining to lectures</td>
<td>10%</td>
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</tbody>
</table>
Any student who is unable to take an exam on the scheduled date will be required to take a make-up exam, which will differ from the in-class exam. Students must have prior authorization from the instructor in order to qualify for a make-up exam. Any student who misses an exam without prior authorization from the instructor will fail the examination. The make-up examination must be taken within 1 week of the scheduled examination. Extra credit assignments will not be given for any students. Additionally, assignments handed in late will receive a 20% reduction off your assignment grade and will only be accepted with prior approval from the instructor. Additionally, the late assignment will only be accepted within 1 week from the original due date.

**Important note.** The academic schedule, including those listed in the syllabus, cannot be modified to accommodate students’ personal activities (e.g., interviews, vacations etc.). Such modifications are prohibited by the audiology division and university policies. Exceptions may be made in the case of documented student illness or an emergency involving the immediate family (mom, dad, siblings). Please notify the instructor immediately should this occur.

Exams are based on topic areas and required readings.

Each student will be assigned two topic areas along with a fellow student. It is the responsibility of the student presenters to lead a discussion pertaining to the topic at the assigned class period. Resources will be located and used to assist the presenters in leading the discussion. The first portion of the discussion is to explain the procedure (i.e., where the response is generated [or thought to be], how the response is measured [settings, stimuli, etc.], what factors will affect your measurement [e.g., body temperature], and typical uses for the procedure for Audiologists) and the second portion of the discussion will revolve around two articles the presenters have chosen for the class to read. The articles chosen should be approved by the instructor **THREE WEEKS BEFORE** the presentation and a copy of each article will be supplied to the instructor to post on Blackboard for the other students. The articles chosen should reflect how these procedures can be used by Audiologists to enhance their care for patients. The **instructor is available for discussion** of your topic area so that appropriate articles will be identified. The presenters will post a summary of their topic on the discussion board in Blackboard by 1pm on the day of their presentation. **Non-presenting students will be required to read the identified articles before each class period so that they can follow the discussion led by the instructor or fellow students.** Each student, excluding the presenters, will post comments on the discussion board under the topic posting by 1pm one week following the presentation and be prepared to be engaged in a 20 minute discussion. More details regarding these assignments can be found on Blackboard.

Participation: Students are expected to participate consistently in class discussions, but are also expected to avoid dominating the discussion. This
should be a cooperative, not a competitive process. Class discussions for the topic presentation will be scheduled during the beginning of the next class session so you have time to digest and think about the topic. The student presenters will facilitate the discussion for their own topic. You can best prepare for the general discussion by making notes about the general discussion questions posted on Blackboard (under Assignments). You will be graded on both the amount and nature of your contributions according to the rubric posted on Blackboard. You are also welcome to ask questions or share a thought / idea on the day the topic is presented.

Grades:
Grades will be assigned on a percentage scale, including +/- >93% = A; 90-92% = A-; 87-89% = B)
Note: Final grades will not be rounded (i.e., a 92.7% is an A- not an A).

Remediation:
A grade of C or higher is required to earn credit for this course. If the earned grade is less than C, the student must successfully repeat this course next time it is offered in order to earn credit and satisfy program requirements. Program disruptions/delays caused by repeating a course are the responsibility of the student.

In order to achieve competencies (meet learner outcomes), especially for the specific ASHA standards (for CCC-A), the student must earn a course grade of C+ (78%) or higher. In addition, the student must earn at least 78% on lab assignments and examinations even if the overall course grade is C+ or higher. If the student earns 73-77% (C) as overall in the course or in any of the identified types of assignments he/she must complete a remediation plan as determined by instructor. If remediation is needed, the course instructor will inform the student of his/her need for remediation at the time final grades are reported (and sends an email to the student’s advisor). For a student who has to remediate, the course instructor will submit a grade of Incomplete (I). After successful remediation, the instructor will submit a change of grade to a C+. For unsuccessful remediation, the instructor will submit a change of grade to a C. If the remediation option is not satisfactorily completed, the student will not satisfy the ASHA certification standards associated with this class, and will be required to meet those competencies in other ways if possible, or the student may not be eligible for CCC-A.

Special Adaptations: If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact Student Disability Services at (619) 594-6473. To avoid any delay in the receipt of your accommodations, you should contact Student Disability Services as soon as possible. Please note that accommodations are not retroactive, and that I cannot provide accommodations based upon disability until I have received an
accommodation letter from Student Disability Services. Your cooperation is appreciated.

**Blackboard:**
Blackboard will be used during the semester.

**USE OF COMPUTERS & WIRELESS TECHNOLOGY IN THE CLASSROOM:**
The use of computers in the classroom is permitted *ONLY* for note-taking purposes. Students are not permitted to use wireless technology (internet, emails, texting etc.) during class unless directed to do so by the instructor. Any violation of this policy will result in a classroom ban on computers for all students. Text messaging during class is not permitted. Cell phones shall be turned off during class. Students who have a compelling reason to keep his/her cell phone turned on (e.g. family emergency etc.) may be granted permission to do so with prior consultation with the instructor. These policies have been enacted to preserve the learning environment in the classroom.

**Class Schedule**

**Table 2 Class Schedule A**

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Readings/ Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 24</td>
<td>High-Frequency (HF) DPOAEs</td>
<td>Dreisbach &amp; Siegel, 2001; 2005</td>
</tr>
</tbody>
</table>
| August 31  | HF DPOAE Results; Ototoxic Monitoring using OAEs; Repeatability of DPOAEs | 1. Dunckley & Dreisbach, 2004  
2. Ress et al., 1998  
3. Katbamna et al., 1999  
4. Dreisbach et al., 2006 |
| September 7| NO CLASS - Labor Day                                                  |                                                           |
| September 14| Stimulus frequency OAEs; Suppression of OAEs                          | 1. Konrad-Martin et al., 2002  
2. Robinette & Glattke, 2007 |
<p>| September 21| Multiple sources of OAEs                                             | Karolina and Joyce                                        |
| September 28| Middle Ear Measurements (reflectance, multifrequency / component tymp, Menieres Disease/Aud Neuropathy), ECochG | Stacey and Anish                                         |
| October 5  | Vestibular Testing (Posturography; Rotary chair; ENOG; VEMP)          | Kaitlin and Heather                                       |
| October 12 | <strong>Midterm examination</strong>                                               |                                                           |</p>
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 19</td>
<td>Middle latency response - MLR (diagnostic applications; learning disabilities; 40 Hz potential) &amp; BioMARK (speech ABR)</td>
<td>Dave and Ashley</td>
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<tr>
<td>October 26</td>
<td>Mismatch negativity response (MMN); Auditory late response (ALR); P300; N400</td>
<td>Joyce and Kaitlin</td>
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<tr>
<td>November 2</td>
<td>Auditory steady state responses (ASSR) - nuts and bolts</td>
<td>Heather and Lucia</td>
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<tr>
<td>November 9</td>
<td>ASSR (newborn/infant applications)</td>
<td>Allison and Stacey</td>
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<tr>
<td>November 16</td>
<td>CHAMP/Stacked ABR</td>
<td>Ashley and Karolina</td>
</tr>
<tr>
<td>November 23</td>
<td>Complete Discussion Board postings to assigned topics</td>
<td></td>
</tr>
<tr>
<td>November 30</td>
<td>Evoked Potential Testing Elicited with Electrical Stimuli; Acoustic Change Complex (ACC)</td>
<td>Anish and Dave</td>
</tr>
<tr>
<td>December 7</td>
<td>Psychophysiology Measures (emphasize auditory)</td>
<td>Lucia and Allison</td>
</tr>
<tr>
<td>December 14</td>
<td><strong>Final Exam 1:00-2:40</strong></td>
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</tbody>
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AuD 840
Auditory Evoked Potentials II
Course Competencies

Entry Behavior
1. Familiarity with anatomy and physiology of the peripheral and central auditory system.
2. Familiarity with common auditory disorders, causes, and associated audiometric configurations and pathophysiology.
3. Familiarity with evoked otoacoustic emissions and auditory brainstem responses.

Behaviorally Defined Objectives/Outcomes
The student outcomes for this course satisfy the specified competencies related to objectives/outcomes established by each of the following bodies:

A) CCC (from 2011 CFCC Standard IV, Knowledge and Skills Outcomes for ASHA Certificate of Clinical Competence)
   A13, A14, A22, A24, C1, C2, C5, C7, C9, C11, F2, F3

B) CAA (from 2009 Standards from ASHA's Council on Academic Accreditation)
   A1, A3, A6, A8, A9, A11, A12, C7, C12, C13, C14, C18

C) JAUD (from 2010 SDSU/UCSD Joint AuD Program Learning Objectives and Goals Item 2: Learning Outcomes for Each Objective)

NOTE: These course-specific outcomes are also part of each student’s CCC KASA and CAA KASA tracking forms.

Competencies
Knowledge Level: K1=introductory; K2=basic; K3=intermediate; K4=advanced
Skill Level: S1=taught; S2=emerging/reinforced; S3=practiced; S4=mastered

With successful completion (> 78%) of all assignments, the student will be able to:
1. Explain principles of averaging and detection of evoked potentials: (K4)
2. Explain rationales underlying selection of various parameters for recording auditory evoked potentials: (K3)
3. Recognize basic issues of auditory brainstem response (ABR), middle latency response (MLR), and cortical response recordings: (K4)
4. Identify the proposed generators of the different evoked potentials: (K3)
5. Demonstrate appropriate and inappropriate uses for various auditory evoked potential tests for clinical use and recognize what happens to the different
auditory evoked potential responses with age, different disorders, and chemical agents: \((K3, S3)\)

6. Discuss calibration and equipment issues important for brief-duration stimuli used to elicit auditory evoked potentials: \((K3)\)

7. Document evaluation procedures and results for different evoked potential measures: \((K3)\)

8. Interpret the results of auditory evoked potential testing and develop appropriate conclusions and recommendations: \((K3, S3)\)

9. Summarize the basics of clinical auditory evoked potential protocols and measure the auditory brainstem response with varied protocols: \((K4)\)

10. Identify patient characteristics (e.g., age, demographics...) and how they relate to the outcomes of different evoked potential procedures: \((K3)\)