A. COMMUNICATING WITH THE PROFESSOR

The preferred method for communication is through ACC E-mail. I will be available to meet with anyone who contacts me to set up an appointment via e-mail. If you need to speak with the Program Chair please email spedigo@alvincollege.edu to set up an appointment.

Students will generally receive a response via e-mail within 24 hours on weekdays if their e-mail is sent before 2:00 p.m.

B. COURSE DESCRIPTION

This course provides you with a basic understanding of Nerve Conduction Studies (NCS) and how they are used in electroneurodiagnostic medicine. You will study basic electrical theory, instrumentation, peripheral nerve anatomy and physiology, recording methods, and waveforms recognition with clinical correlations. You will emphasize the safety of the patient. In the lab you will learn the basics of nerve and muscle stimulation and recording, using surface electrodes.

C. METHODOLOGY

This is a combined lecture and lab course. The class will be conducted on campus in room S246 and will meet once a week. Classroom time is used to demonstrate knowledge of lecture material in a hands-on approach with practice of all modalities on volunteer subjects. Topics are presented by the instructor with student skill-based learning and practice, an essential part of the course. Unit exams will be administered during scheduled classroom times (see class schedule).

D. PRE-REQUISITES/CO-REQUISITES

ENDT1345, ENDT1350, PSGT1310, ENDT1463, ENDT2320, ENDT2425 (co-requisite)

E. TEXTBOOKS

Nerve Conduction Studies from A to Z, Barbara O. Crout, R.EDT and Charles W. Flicek, 2005

Manual of Nerve Conduction Studies, Ralph M. Buschbacher and Nathan Prahlow, 2006
F. COURSE GOALS, OBJECTIVES AND COMPETENCIES

COURSE OUTLINE

| Unit 1 | Electrical Principles and Instrumentation |
| Unit 2 | Basic Anatomy and Physiology for Nerve Conduction Studies |
| Unit 3 | Concepts of Nerve Conduction Studies |
| Unit 4 | Upper Extremity Nerve Conduction Studies |
| Unit 5 | Lower Extremity Nerve Conduction Studies |
| Unit 6 | F-Waves, H-Reflexes, and Uncommon Tests |
| Unit 7 | Clinical Indications for Nerve Conduction Studies |

Unit 1 - Electrical Principles and Instrumentation

General Objective: The student should demonstrate knowledge basic electrical theory and be able to apply principles and concepts of NCS instrumentation to the recording by understanding: the function of differential amplifiers, effects of stimulus and recording parameters on NCS waveforms, electrode impedance and its importance, as well as electrical safety.

I. Applying Principles of Electronics and Mathematics to NCS recording
II. Effects of stimulus and Recording Parameters on NCV Waveforms
III. Electronic instrumentation and Standards of Obtaining Quality Waveforms
IV. Electrical Safety

Unit 2- Basic Anatomy and Physiology for Nerve Conduction Studies

General Objective: The student should know the fundamentals of anatomy and physiology as it relates to Nerve Conduction Studies.

I. Anatomy of a Nerve
II. Nerves of the Upper Limb
III. Nerves of the Lower Limb
IV. Function of the Peripheral Nervous System

Unit 3- Basic Concepts of Nerve Conduction Studies

General Objective: The student should demonstrate knowledge of waveform analysis, ensure the equipment is appropriately equipped to obtain study, accurately place electrodes, and obtain optimal patient cooperation by continually supporting the patient through verbal reassurance. Must also describe various ways to troubleshoot problematic errors of a study.

I. Introduction to Nerve Conduction Studies
II. CMAPs & SNAPs
III. Waveform Analysis
IV. Troubleshooting
Unit 4 - Upper Extremity Nerve Conduction Studies

General Objective: The student will be able to demonstrate knowledge of placing recording, reference, and ground electrodes utilizing anatomical sites to demonstrate knowledge of obtaining quality waveforms for median, ulnar and radial motor and sensory nerve conduction studies; understand the principles of measuring waveforms, distances and calculating nerve conduction velocities. Must also have knowledge of the clinical correlations of upper extremity NCS abnormalities; have knowledge of artifacts encountered during nerve conduction studies and basic techniques for trouble shooting; be familiar with distal latencies and conduction velocities of waveforms and how they are used.

I. Motor NCV’s
II. Sensory NCV’s
III. Measuring and Assessing Values
IV. Normal vs. Abnormal Waveforms

Unit 5 - Lower Extremity Nerve Conduction Studies

General Objective: The student will be able to demonstrate knowledge of placing recording, reference, and ground electrodes utilizing anatomical sites to demonstrate knowledge of obtaining quality waveforms for peroneal and anterior tibialis motor and sural and saphenous sensory nerve conduction studies; understand the principles of measuring waveforms, distances and calculating nerve conduction velocities. Must also have knowledge of the clinical correlations of lower extremity NCS abnormalities; have knowledge of artifacts encountered during nerve conduction studies and basic techniques for trouble shooting; be familiar with distal latencies and conduction velocities of waveforms and how they are used.

I. Motor NCV’s
II. Sensory NCV’s
III. Measuring and Assessing Values
IV. Normal vs. Abnormal Waveforms

Unit 6 – F Waves, H-Reflexes, & Uncommon Tests

General Objective: The student will be able to complete a motor study on the nerve from which the F-wave or H-Reflex will be obtained to assess nerve status and differentiate between A-waves, H-reflex, and F-waves, obtain the repetitive nerve stimulation study and blink reflexes by following established protocols, and perform infrequent studies of motor and sensory nerves to include comparison studies on the contralateral side if normal values are not established.

I. F-Waves
II. H-Reflexes
III. Repetitive Nerve Stimulation
IV. Blink Reflex
V. Other Uncommon Nerve Studies
VI. Measuring and assessing values
Unit 7- Clinical Indications for Nerve Conduction Studies

General Objective: The student should be familiar with various diseases and disorders affecting the peripheral nervous system to identify the common indications presented in order to make sound decisions regarding the correct NCS protocol to perform and fully document the condition of the patient.

I. NCS Terminology
II. Disease Processes
III. General Protocol of the Peripheral Nervous System

COURSE COMPETENCIES

Upon completion of this course, the student will be able to:
1: Describe the basic principles of electricity and how they apply to nerve conduction studies.
2: Describe instrumentation and controls that aid in nerve conduction testing.
3: Demonstrate an understanding of the anatomy and physiology of selected muscles and nerves.
4: Describe the principles of measurements, calculations and test parameters vital in NCS testing.
5: Demonstrate the ability to record common and infrequent studies.
6: Demonstrate an understanding of diseases and disorders of the peripheral nervous system.

G. ASSIGNMENTS, LABS, EXAMS & GRADING SUMMARY

1. ASSIGNMENTS
   There will be various homework assignments that will correlate with weekly readings or special topics. Students will be expected complete and turn in these assignments on the date specified in the class schedule. It is the student’s responsibility to ensure that the assignment is turned in on the date specified. Ten (10) percent will be deducted on the assignment for every day the assignment is late.

2. LABORATORY
   This will consist of all “hands-on” experience. Students are expected to attend the full duration of every class and contribute to all class activities. This means you will need to both perform studies as well as volunteer to be a subject for another student. Points will be deducted if you do not participate in class discussions and other learning activities or if you repeatedly arrive late or leave early.

3. UNIT EXAMS
   Unit exams will be given as well as a comprehensive final exam. Exams will be administered during scheduled classroom times. Any missed exam times will be made up at a time decided upon by the instructor if a medical excuse or family emergency can be shown. In the case of a family emergency advanced notice must be given prior to the test time expiring (preferably via email) to an ACC Electroneurodiagnostic Program Instructor. In the event of an unexcused missed exam no makeup will be given. There will be no exceptions to this rule.

4. COMPREHENSIVE FINAL EXAM
   During finals week a comprehensive final will be given. The Final Exam will be at the college during scheduled Laboratory time on the date posted on Blackboard (see class schedule).
5. **BONUS POINTS**
Student will receive up to five (5) bonus points, to be added to any unit exam for this course, by completing any of the following activities. Prior approval must be obtained from the instructor.
- Attend an Electroneurodiagnostic society meeting or educational conference/in-service and present a topic covered at the meeting/conference on the discussion board. Such presentations should be at least 1000 words.
- Attend a Health Fair and represent our department in a professional and useful manner.
- Any other bonus point activity as announced or approved by the instructor.

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<thead>
<tr>
<th>GRADING SUMMARY</th>
<th>% of final grade</th>
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<tbody>
<tr>
<td>Assignments</td>
<td>20%</td>
</tr>
<tr>
<td>Lab attendance/participation</td>
<td>20%</td>
</tr>
<tr>
<td>Unit Exams</td>
<td>40%</td>
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<tr>
<td>Final Exam</td>
<td>20%</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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Your grade is based on the average you receive on all course assignments and activities. Always notify your instructor if you are concerned with your grades or your status in the class.

I. **Incomplete**. No Incompletes or “I” grades will be given except for extreme circumstances. If an “I” grade is assigned and the course work is not completed by the pre-arranged time limit, this grade will convert to an “F.”

W. **Withdrawal**. Students who file withdrawal requests by the published deadline will receive a grade of “W.” If a decision is made to withdraw, the student must start the process at the Enrollment Services Center, room A-100, before the deadline. Failure to withdraw may result in a grade of F.

H. **LATE COURSE WORK POLICY**. Any missed exam will be made up at a time decided upon by the instructor *IF* a medical excuse or family emergency can be shown. In the case of a family emergency advanced notice must be given prior (preferably via e-mail) to any ACCElectroneurodiagnostic Program Instructor. In the event of an unexcused missed exam or presentation no make-up will be given. There will be no exceptions to this rule.

I. **EXAM POLICY**. There will be 2 unit exams (see schedule) and a comprehensive final at the end of the semester. These exams will be over material covered in each unit and may contain multiple choice, short answer, matching, essay questions and practical.

J. **EXPECTATIONS**

1. Students are expected to obtain required textbooks before the end of the first week of class.
2. Students are expected to attend class each time it is in session and be seated and ready prior to the start of class.

K. **ACADEMIC SUCCESS AND SUPPORT SERVICES**

1. Computers are available for use by all registered ACC students in many of the 23 ACC/PCC computer labs, including the Cyber Lab, room A-173. Cyber Lab hours are: Mon-Thurs. 8:00 a.m.- 8:00 p.m., Friday 8:00 a.m. – 5:00 p.m. and Sunday 4:00 p.m.- 8:00 p.m. Call 281-756-3544 for more information about all ACC computer labs. Students will not be penalized if there is interruption in MyBlackboard, if the instructor is notified of such an issue from the
Distance Education Department.

2. The ACC Library website is: http://www.alvincollege.edu/library/default.htm

3. The ACC Learning Lab and Writing Center, A-235, is for tutoring, exams, and additional computer access: http://www.alvincollege.edu/resources/learning_lab.htm

4. MyBlackboard-Any technical problems or issues with MyBlackboard should be directed to the Distance Education Department at de@alvincollege.edu. Include your first and last name, student ID number and a description of the problem.

5. WEBACCESS, Passwords or Computer Labs-contact the IT Dept. Help Desk at 281-756-3544

L. AMERICANS WITH DISABILITIES ACT- ACC complies with ADA and 504 Federal guidelines by affording equal access to individuals who are seeking an education. Students who have a disability and would like classroom accommodations must register with the Office of Disability Services, A 136, (281)756-3533. Instructors are not able to provide accommodations until the proper process has been followed.

M. CODE OF ACADEMIC INTEGRITY AND HONESTY- Students at Alvin Community College are members of an institution dedicated to the pursuit of knowledge through a formalized program of instruction and learning. At the heart of this endeavor, lie the core values of academic integrity which include honesty, truth, and freedom from lies and fraud. Because personal integrity is important in all aspects of life, students at Alvin Community College are expected to conduct themselves with honesty and integrity both in and out of the classroom. Incidents of academic dishonesty will not be tolerated.