

<b>Program Director:</b>	Kelly Truitt, BA, REEGT, RNCST	<b>E-MAIL:</b>	<a href="mailto:ktruitt@alvincollege.edu">ktruitt@alvincollege.edu</a>
<b>OFFICE:</b>	S250	<b>PHONE:</b>	281-756-5644
<b>OFFICE HOURS:</b>	Wednesdays 10:30am-3:30pm; Thursdays 4:00pm – 5:00pm; or by Appointment		
<b>WEBSITE:</b>	<a href="http://www.alvincollege.edu">www.alvincollege.edu</a>		

## WELCOME TO ACC:

### WELCOME TO:

**Course Title:** Electroencephalography

**Course Number:** ENDT 1345

**Credit Hours:** 3

**Lecture Hours:** 2

**Lab Hours:** 2

**Total Contact Hours:** 64

**Term and Year:** Fall 2018

**Class Days & Times:** Wednesday Lecture 8:00am- 10:10am; Lab is Monday 1pm-3:10pm (combined with 1350 Lab)

**Classroom Location:** S245 and S246

### **A. COMMUNICATING WITH YOUR INSTRUCTOR**

All electronic communication between ACC faculty and students will be through college email. All correspondence **requires** use of your ACC email address (example@student.alvincollege.edu). Please be sure to check your email on a regular basis so that you do not miss important information.

If you are a new student or a returning student who does not have an email account, please access

<http://www.alvincollege.edu/Campus-Technology> to set-up your WebACCess ID and ACC student email account. Additional information, including technical assistance, can be acquired on the Campus Technology website or by phone (281.756.3544) and email (itservices@alvincollege.edu).

### **B. COURSE DESCRIPTION**

Theory and application of electrical concepts, recording techniques, data analysis, and descriptions. Includes electronics and instrumentation associated with the conventional electroencephalograph such as the power supply, contribution of electrodes, differential amplifier concepts, filters (low frequency, high frequency, and 60-Hz filters), the writer unit, electrical output, electrical safety, and standard for clinical electroencephalographs. Also covers ambulatory monitoring and digital electroencephalography.

### **C. STUDENT LEARNING OUTCOMES**

Summarize atomic theory as it applies to the principles of charge; differentiate between voltage, current, resistance, power, AC/DC, capacitance, and inductance; apply principles of electronics to elements in series and in parallel; explain the use of transformers, semiconductors (diodes, transistors/amplifying devices, and digital devices); and demonstrate correct calibration of commonly used instruments.

### **D. PRE-REQUISITE COURSES:** None

**CO-REQUISITES:** ENDT 1350

### **E. REQUIRED TEXTBOOK AND SUPPLEMENTAL READINGS**

- o Book: Practical Guide for Clinical Neurophysiologic Testing: EEG, 2nd Edition, T. Yamada & E. Meng ISBN 978-1-4963-8302-0
- o Book: Practical Approach to Electroencephalography, Mark Libenson, 2010 ISBN 978-0-7506-7478-2

For more information about the textbooks, including details about how to order your book online and have it delivered to you, visit the ACC College Store at [www.alvinccstore.com](http://www.alvinccstore.com).

## **F. COURSE OUTLINE**

**UNIT 1** Fundamentals of Basic Electronics, Voltage, Current Flow, Resistance (OHMs law), Electricity and Electrical Safety as it related to END Technology

**UNIT 2** EEG Amplifiers, Filters, Filter Effects, Sensitivity and Gain

**UNIT 3** Polarity Convention, Localization, Montages

**UNIT 4** Digital EEG Concepts, Signal Acquisition and Processing, Timescale/ Paper Speed

### **UNIT 1 OBJECTIVES**

Upon completion of this course, the student will be able to

1. State the structure of atoms and ions.
2. List the characteristics of electricity
3. State the forms of electricity
4. Define terms: electromotive force (EMF), voltage, current and resistance
5. State the principles of current flow.
6. State Ohm's law
7. State the electrical prefixes used in END
8. State the ways to maintain electrical safety

### **UNIT 2 OBJECTIVES**

Upon completion of this course, the student will be able to

1. Describe and state the functions of the EEG components
2. State the functions of the amplifier.
3. State the functions of the differential amplifier
4. State the purpose and function of sensitivity and gain
5. Perform calculations for voltage, Sensitivity and amplitude
6. Define impedance
7. State the ACNS guidelines for Impedances
8. Describe common mode rejection.
9. State the basic function of the differential amplifier as it relates to impedance
10. Apply the concepts of filter functions to Neurodiagnostic data

### **UNIT 3 OBJECTIVES**

Upon completion of this course, the student will be able to

1. Define terms: Localization, focus, polarity, derivation, field, dipole, summation, cancellation and montage.
2. Apply the polarity convention rules to EEG data.
3. Calculate voltage difference between input 1 and input2
4. Apply the polarity convention to determine the direction of pen deflection
5. State the purposes of montages
6. Describe the types of montages
7. List the methods of localization used in bipolar and referential montages
8. State the concepts that are unique to Digital EEG (analog to digital conversion, amplitude resolution, sampling rate, Nyquist theory)

### **UNIT 4 OBJECTIVES**

Upon completion of this course, the student will be able to

1. State the concepts that are unique to Digital EEG (analog to digital conversion, amplitude resolution, sampling rate, Nyquist theory)
2. Define Paper speed / Timescale
3. State the application of paper speed in analog EEG technology
4. State the application of Time base in digital EEG technology
5. State the effects of Timescale/paper speed changes on EEG
6. State clinical uses for the timescale/paper speed function
7. Apply measurement tips to paper speed concepts

G. EXAMS AND MAJOR ASSIGNMENTS	H. POLICIES ABOUT COURSEWORK AND DEADLINES
Quizzes and Assignments (25%)	- any assignment not turned in by the due date and time will receive a late deduction of 10 points per day. - Quizzes will only be given in the first 15 minutes of the class. No makeup will be allowed. -Lowest Grade will be dropped at the end of the semester
Unit Exams (60%)	-4 Exams, Multiple Choice format - Students may miss one examination which must be made up on the date of return prior to the scheduled class. For each additional missed exam, no makeup will be given.
FINAL EXAM (15%)	-Comprehensive, Multiple Choice format - The final exam will only be given during Finals week. No makeup will be allowed for missed Final Exams. An "Incomplete" for missing a final exam will be given <b>ONLY</b> for extreme, inevitable circumstances. An "inevitable" circumstance will be defined at the discretion of the instructor and documentation must be provided.

**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".

## I. GRADING SUMMARY

	% of Final Grade
Quizzes and Assignments	25%
Unit Exams	60%
FINAL EXAM	15%
<b>Total</b>	<b>100%</b>

Grading Scale	Grade
90-100	A
80-89	B
70-79	C
Below 70	F

## J. WITHDRAWAL FROM CLASS/COLLEGE

It is recommended that the student talk to the instructor before withdrawing. Current course withdrawal information can be found in the printed version of the ACC Schedule for this semester or online at [ACC Course Withdrawal Instructions](#). Students who file withdrawal requests by the published deadline and have not exceeded the withdrawal maximum will receive a grade of W.

### Six Drop Limit

The Texas Legislature passed a ruling that limits the number of classes a student can drop during their years as an undergraduate student to six. This policy applies to any student who was a first time college freshmen fall, 2007, or later, who attends a Texas public institution of higher education. Courses dropped while attending a private or out of state college do not count toward the six drop limit. For further information, refer to the [ACC Catalog](#) or contact Student Services.

## K. COURSE GRADE APPEAL PROCESS

Students have one year from the date of the grade assignment to challenge a grade. Refer to the grade appeal process as published in the [ACC Catalog](#) on page 36.

## L. CLASS ATTENDANCE POLICY

**ENDT 1345 Policy-** Attendance for the ENTIRE class is mandatory. **After the second missed class, five (5) points will be deducted from the final grade for each additional absence.**

Alvin Community College students are required to attend classes. If an absence is unavoidable, the student is responsible for completing all work missed during the absence. Instructors will not withdraw students for non-attendance, except in developmental courses. Absences in excess of two weeks will be to be reported to the Office of Advising Services, along with appropriate recommendations. Departments and faculty may have other attendance policies for their course.

Faculty may issue the grade of FX for non-attendance after the official census date. The FX grade has no grade points assigned per semester hour due to a student's non-attendance.

## **M. CODE OF ACADEMIC INTEGRITY AND HONESTY**

Alvin Community College students 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 and students guilty of such conduct are subject to severe disciplinary measures. Additional information is located in the [ACC Student Handbook](#).

## **N. CLASSROOM CONDUCT**

It is the right of each student to participate in his or her learning, and it is the responsibility of each student to not interfere with the learning of other students. It is the expectation of the college that each student assumes the responsibility to follow college policies and procedures governing classroom conduct on campus and online. Instructors are authorized to establish within reason, rules of conduct within the classroom. Instructors may ask a student to temporarily leave the classroom whenever the behavior is believed to be disruptive or inappropriate. Additional information is located in the ACC Student Handbook. Additional information is located in the [ACC Student Handbook](#).

## **O. EVALUATION OF INSTRUCTION**

Alvin Community College is dedicated to student success. As part of its ongoing improvement efforts, students will provide input for each course prior to the end of the semester enrolled. Evaluations will be completed in either online or paper format as directed by the Office of Institutional Effectiveness & Research.

## **P. ACC ACADEMIC SUCCESS AND SUPPORT SERVICES**

The [ACC Tutoring/Learning Lab](#), located upstairs in building A, provides students with a variety of services including tutoring (math, writing, and other disciplines); computers and printers; and tables/carrels. Call 281-756-3566 or visit the **ACC Tutoring/Learning Lab Website** for more information.

The [ACC Library](#) is an excellent source for research and writing help. Quiet rooms are available for studying and doing class work. For more information, visit the **ACC Library Website** or call 281-756-3559.

[ACC Counseling Services](#) assist students with issues that may negatively impact academic success. To contact a counselor, call the office of Advising Services at 281-756-3531.

### **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 first with the Office of Disability Services, A 136, or call 281-756-3533. Instructors are not able to provide accommodations until the proper process has been followed.

### **Assessment and Care Team (ACT)**

The Assessment and Care Team is committed to improving community safety through a proactive, collaborative, coordinated, objective, and thoughtful approach to the prevention, identification, assessment, intervention and management of situations that pose a threat to the safety and well-being of the campus community. To educate and empower all members of the College community, resources and procedures are in place to prevent, deter, and respond to concerns regarding acts of violence. Alvin Community College offers assistance to departments and individuals in detecting indicators for concern and resources to protect themselves and their environments.

The Alvin Community College ACT accepts reports regarding any individual or incident at any time through an online referral form on the Assessment and Care Team page at <http://www.alvincollege.edu/ACT>, direct email to: [ACareTeam@alvincollege.edu](mailto:ACareTeam@alvincollege.edu), or by contacting the Alvin Community College Police Department at 281-756-3700 or 832-250-3365 (after hours).

### **Educational Technology**

Alvin Community College educational technology includes [MY Blackboard](#) for distance delivery and web-enhancement of courses. Technical support can be obtained by completing the [Online Support Form](#).

All students have a [WEBACCESS](#) account to access numerous college services. If you need information or experience problems with WebACCess, your password, computers in a campus lab, or college email, please call the Help Desk at 281-756-3544 or email [helpdesk@alvincollege.edu](mailto:helpdesk@alvincollege.edu).

**Q. MENTAL HEALTH COUNSELING AND SUICIDE PREVENTION SERVICES**

As a student, you may experience a range of challenges that can interfere with learning, such as strained relationships, increased anxiety, substance use, feeling down, difficulty concentrating, and/or lack of motivation. These mental health concerns or stressful events may diminish your academic performance and/or reduce your ability to participate in daily activities. Advising services employs two Licensed Professional Counselors who can assist students with issues that negatively impact academic success. Consultation and referrals are confidential. The Counseling Referral form is located at: <http://www.alvincollege.edu/CounselingServices.aspx>

**Emergencies:**

If you or someone you know at ACC feels overwhelmed, hopeless, depressed, and/or is thinking about dying by suicide, supportive services are available by requests at the Enrollment Services Center or by calling 281-756-3531, ask for a Counselor. You may also call the National Suicide Prevention Hotline 1-800-273-8255. This is a 24 hour, toll free, confidential suicide prevention hotline available to anyone in suicidal crises or emotional distress. If, however, you or someone you know is in an immediate crisis, go to the nearest Emergency Room, or call 911.

**R. DISCLAIMER**

(Faculty reserve the right to modify this syllabus as needed and will notify the students of any changes using email or Blackboard.)