ELECTRONEURODIAGNOSTIC TECHNOLOGY (END)

END-1300 Introduction to Electroneurodiagnostic Technology
2 Credits

Introduction and orientation to health careers in field of electroneurodiagnostics including specific duties, certifications and licensure requirements, work setting and conditions, and career ladder opportunities. Overview of standards of practice of clinical neurophysiology with emphasis on neuroscience technique, instrumentation, terminology of electroneurodiagnostic practices and recording/monitoring techniques utilized in determination of treatment plans for neurological disorders, and basic medical terminology.
Lecture: 2 hours
Prerequisite(s): None.

END-1312 Cardiopulmonary Anatomy and Physiology
3 Credits

Anatomy and physiology of cardiovascular and pulmonary systems. Cardiovascular system anatomy and electrophysiology of the heart, electrocardiography (ECG) interpretation, blood flow characteristics and hemodynamics. Pulmonary system anatomy and physiology overview, principles of ventilatory control, diffusion, gas transport, and oxygenation.
Lecture: 3 hours
Prerequisite(s): BIO-2331 Anatomy and Physiology I, and departmental approval: admission to program.

END-1350 Introduction to Electroencephalography (EEG)
3 Credits

Provides basic knowledge of electroencephalography, and EEG concepts utilized for diagnosis of various cerebral disorders. Includes history, development, basic neurophysiology concepts of EEG, and normal and abnormal brain wave patterns in adults and children, with emphasis on instrumentation and recording techniques.
Lecture: 2 hours. Laboratory: 2 hours
Prerequisite(s): BIO-2331 Anatomy and Physiology I or concurrent enrollment, and concurrent enrollment in END-1300 Introduction to Electroneurodiagnostic Technology, and departmental approval: admission to program.

END-1450 Intermediate Electroencephalography (EEG)
3 Credits

Discussion of clinical significance of epileptiform patterns, pharmacological effects on EEG recordings, EEG correlation of infection, and vascular and structural disease. Presentation and discussion of criteria for specialized recording techniques used in prolonged EEG recordings and specialized areas of the hospital, such as intensive care and operating room. Discussion of EEG signal analysis.
Lecture: 2 hours. Laboratory: 2 hours
Prerequisite(s): END-1350 Introduction to EEG, or departmental approval.

END-1500 Basic Evoked Potentials
3 Credits

Basic discussion of evoked potential recording techniques. Emphasis on equipment, principles of operation, associated waves related to normal and abnormal waveforms, placement and calibration, and obtaining clearly resolved and replicated obligated waveforms of brainstem auditory, visual, and somatosensory evoked potentials in adults and pediatric subjects.
Lecture: 2 hours. Laboratory: 2 hours
Prerequisite(s): END-1450 Intermediate EEG or concurrent enrollment, or departmental approval.

END-1911 END Directed Practice I
3 Credits

Clinical electroencephalography experience in a selected neurodiagnostic lab or an affiliated health care facility under the direct supervision of an EEG technologist or physician. Emphasis on EEG concepts. Performance of EEG testing on clinical patients, medical record keeping, and clinical history taking.
Laboratory: 4.5 hours
Other Required Hours: Directed Practice: 8 hours per week for 15 weeks.
Prerequisite(s): END-1350 Introduction to Electroencephalography (EEG) and concurrent enrollment in END-1450 Intermediate Electronecephalography (EEG).

END-2300 Nerve Conduction Studies
3 Credits

Basic discussion of nerve conduction studies and electromyography. Emphasis on equipment, knowledge of placement stimulation sites, sources of error in nerve conduction studies, electronics, pathology (abnormal nerve conduction studies, anatomy as it pertains to entrapment sites and nerve conduction studies), waveforms identification and case presentation.
Lecture: 2 hours. Laboratory: 2 hours
Prerequisite(s): END-1450 Intermediate Electroencephalography (EEG), and concurrent enrollment in END-2911 END Directed Practice II, or departmental approval.

END-2320 Intermediate Nerve Conduction Studies
3 Credits

Advanced discussion of nerve conduction studies and electromyography. Emphasis on less routine nerve conduction studies (NCS), anomalous innervations, equipment, knowledge, placement stimulation sites, sources of error in nerve conduction studies, electronics, pathology, waveforms identification and case presentation.
Lecture: 2 hours. Laboratory: 2 hours
Prerequisite(s): END-2300 Nerve Conduction Studies.

END-2401 Intraoperative Monitoring for Electroneurodiagnostic Technologists
3 Credits

Introductory discussion of intraoperative monitoring of entire nervouse system structure and function integrity during surgical procedures. Types of recordings, technologists role, recording parameters, reasons for surgical monitoring, variables affecting monitoring, and critical parameters.
Lecture: 3 hours
Prerequisite(s): END-1450 Intermediate Electroencephalography (EEG), and END-1500 Basic Evoked Potentials, and BIO-2341 Anatomy and Physiology II or concurrent enrollment.

END-2413 Neurophysiology of Electroencephalography/Sleep Disorders
3 Credits

Analysis of the central and peripheral nervous system, electrophysiology, and nerve conducting velocities in health and disease. Includes discussion of neurophysiology of sleep and the role of the autonomic nervous system. Emphasis on respiratory and cardiovascular effects, regulation of sleep, circadian rhythms and maturation of the sleep stages addressing neonates to adults.
Lecture: 3 hours
Prerequisite(s): BIO-2341 Anatomy and Physiology II, and END-1450 Intermediate Electroencephalography (EEG), or departmental approval.

END-2421 Intermediate Intraoperative Monitoring
3 Credits

Intermediate discussion of principles of intraoperative monitoring of the nervous system structure and function integrity during surgical procedures. Emphasis on various types of surgery, decision making on the modality, signal improvement, in-depth discussion of variables and co-morbidities, surgical outcomes.
Lecture: 2 hours. Laboratory: 2 hours
Prerequisite(s): END-2401 Intraoperative Monitoring for Electroneurodiagnostic Technologisits; or departmental approval.

END-2451 Neonatal/Pediatric Electroencephalography
3 Credits

Discussion of neonatal and pediatric electroencephalography. Review the electrographic and clinical findings associated with neonatal and pediatric epilepsy syndromes and seizures. Discussion of long term epilepsy monitoring, pediatric epilepsy surgery and functional cortical mapping. Discussion of automatic seizure detection, artifact rejection and trending software.
Lecture: 3 hours
Prerequisite(s): END-1450 Intermediate Electroencephalography (EEG).

END-2510 Principles of Polysomnography
3 Credits

Overview of the field of Polysomnography including job responsibilities, credentialing, medical ethics and patient confidentiality. Normal and abnormal sleep patterns, integrating the physiologic functions of the nervous system. Emphasis on basic sleep sciences, physiology, monitoring, montages, electrical safety, diagnosis and treatment of sleep disorders, and PSG patient hook-up and monitoring procedures.
Lecture: 2 hours. Laboratory: 2 hours
Prerequisite(s): BIO-2341 Anatomy and Physiology II, and END-1450 Intermediate Electroencephalography (EEG), and END-1500 Basic Evoked Potentials, and END-1911 END Directed Practice I.

END-2520 Intermediate Polysomnography I
3 Credits

Discussion of the classification of sleep disorders, and the physiological effects of sleep disorders and ramifications/implications on patient health. Discuss medication effects on sleep stages/patterns. Discussion of various therapies for sleep disordered breathing, and other sleep disorders. Discussion on monitoring of nocturnal seizures, and seizure types. Laboratory section focus on PAP set-up, nocturnal O2, CO2 monitoring, as well as administration of nocturnal O2, and advanced set-ups for nocturnal seizure monitoring.
Lecture: 2 hours. Laboratory: 2 hours
Prerequisite(s): END-2510 Principles of Polysomnography, and END-2911 END Directed Practice II, and END-2451 Neonatal/Pediatric Electroencephalography.

END-2530 Intermediate Polysomnography II
3 Credits

Presentation and discussion of parameters, digital and technical specifications of polysomnography, the staging and scoring of adult and pediatric sleep patterns, and identification/classification of various forms of sleep disordered breathing and movement disorders. Discussion of sleep calculations and daytime sleep studies (MSLT/MWT). Discussion on advanced PAP therapies (ASV) and esophageal pH and NPT testing. Discussion of aspects of sleep disorders lab management, and Home Sleep Testing (HST).
Lecture: 2 hours. Laboratory: 2 hours
Prerequisite(s): END-2412 Neurophysiology of Electroencephalography/Sleep Disorders, and END-2520 Intermediate Polysomnography I , and END-2915 Polysomnography Directed Practice I.

END-2820 Advanced Independent Study/Research in Electroneurodiagnostic Technology
1-3 Credits

Independent two-hour lab per credit. Directed individual study. Study/research title and specific content arranged between instructor and student (see Credit Schedule of classes for current offerings). May be repeated for a maximum of six credits of different topics.
Lecture: 1-3 hours
Prerequisite(s): Departmental approval, and instructor approval, and ENG-0995 Applied College Literacies, or appropriate score on English Placement Test. Note: ENG-0990 Language Fundamentals II taken prior to Fall 2021 will also meet prerequisite requirements.

END-2911 END Directed Practice II
2 Credits

Continuation of directed practice in clinical setting at neurology laboratory or neurodiagnostics department. Departmental orientation, policies and procedures, assist patient setup, performance and discontinuance of neurodiagnostic activities performed at the assigned clinical site.
Lecture: 1 hour
Other Required Hours: Directed Practice: 8 hours per week for 10 weeks (80 hours total).
Prerequisite(s): END-1500 Evoked Potentials and END-1911 END Directed practice I; or departmental approval.

END-2915 Polysomnography Directed Practice I
3 Credits

Directed practice in the clinical setting in a sleep laboratory or a sleep center. Departmental orientation, policies and procedures, individual body mechanics and patient transfer techniques. Gather and analyze patient information, perform testing preparation procedures, perform polysomnographic procedures. Emphasis on performing overnight diagnostic and therapeutic polysomnograms.
Other Required Hours:15 hours per week Directed practice in a clinical setting. (Two 7.5 hour days)
Prerequisite(s): END-2510 Principles of Polysomnography, and END-2911 END Directed Practice II, and END-2451 Neonatal/Pediatric Electroencephalography; and concurrent enrollment in END-2520 Intermediate Polysomnography I.

END-2922 END Directed Practice III
3 Credits

Clinical neurodiagnostic experience in a selected neurodiagnostic lab in health care facility under direct supervision of an END technologist or physician office. Emphasis on EEG testing in neonates, infants and pediatric population, long-term monitoring, and critical care units, and additional specialty modalities, including but not limited to NCS testing, medical record keeping and clinical history taking.
Lecture: 1.5 hour
Other Required Hours: Directed Practice: 112.5 hours at a Clinical Site per semester.
Prerequisite(s): END-2911 END Directed Practice II, and END-2451 Neonatal/ Pediatric Electroencephalography; or departmental approval.

END-2990 Electroneurodiagnostic Capstone
1 Credit

Capstone course in Electroneurodiagnostic Technology. Assessment of one`s knowledge, experience and skills as electroneurodiagnostic technologist. Preparation and presentation of qualifications through written resume and portfolio. Guidelines and preparation for employment interview. Investigation into electroneurodiagnostic issues.
Lecture: 1 hours
Prerequisite(s): END-2922 END Directed Practice III, or END-2520 Intermediate Polysomonography I.