

Polysomnography Technology Mississippi Curriculum Framework

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The Office of Curriculum and Instruction (OCI) was founded in 2013 under the Division of Workforce, Career, and Technical Education at the Mississippi Community College Board (MCCB). The office is funded through a partnership with The Mississippi Department of Education (MDE), who serves as Mississippi's fiscal agent for state and federal Career and Technical Education (CTE) Funds. The OCI is tasked with developing statewide CTE curriculum, programming, and professional development designed to meet the local and statewide economic demand.

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ADOPTION OF NATIONAL CERTIFICATION STANDARDS

The CoA PSG is a member of the Commission on Accreditation of Allied Health Education Programs (CAAHEP). The mission of the CoA PSG in cooperation with CAAHEP is to establish, maintain and promote appropriate standards of quality for educational programs in Polysomnographic Technology and to provide recognition for educational programs that meet or exceed the minimum standards outlined in the accreditation Standards and Guidelines for the Accreditation of Educational Programs in Polysomnographic Technology.

CAAHEP is the largest programmatic accreditor in the health sciences field. In collaboration with its Committees on Accreditation, CAAHEP reviews and accredits over 2000 educational programs in health science occupations. CAAHEP is recognized by the Council for Higher Education Accreditation (CHEA). CAAHEP is also a member of the Association of Specialized & Professional Accreditors (ASPA).

In this curriculum, students will be prepared for positions in the area of Polysomnography/ Sleep Technology (PSG).

The Committee on Accreditation for Polysomnographic Technologist Education is involved in programmatic process of accreditation. The CoA PSG reviews educational programs in polysomnographic technology to determine the extent to which the program meets the Standards and Guidelines for the Accreditation of Educational Programs in Polysomnography Technology.

After evaluating a program, the CoA PSG formulates a recommendation for accreditation, and forwards it to the Commission on Accreditation of Allied Health Education Programs (CAAHEP). CAAHEP reviews the CoA PSG recommendation, assures that due process took place during the evaluation process, and makes the final award of accreditation.

Accreditation is awarded to a program when it is determined that the program is in substantial compliance with the standards. Accreditation provides assurance that educational programs are following national standards that have been developed by the profession. In addition, graduates of CAAHEP-accredited polysomnography programs are eligible to take the Board of Registered Polysomnographic Technologists exam (BRPT).

INDUSTRY JOB PROJECTION DATA

Polysomnography Workers or Sleep Technician occupations require an education level of post-secondary career and technical award. There is a 14.29% increase in occupational demand at the regional level and a 23.17% increase at the state level. Median annual income for Health Care Technologists and Technicians is \$31,449.60 at the state and regional levels. A summary of occupational data from the State Workforce Investment Board Data Center is displayed below:

Table 1: Education Level

Program Occupations	Education Level
Health Care Technologists and Technicians	Post-Secondary Career and Technical Award

Table 2: Occupational Overview

	Region	State	United States
2010 Occupational Jobs	84	164	87,040
2020 Occupational Jobs	96	202	104,448
Total Change	12	38	17,408
Total % Change	14.29%	23.17%	20.00%
2010 Median Hourly Earnings	\$15.12	\$15.12	
2010 Median Annual Earnings	\$31,449.60	\$31,449.60	\$0.00
Annual Openings	1	3	1740

Table 3: Occupational Breakdown

Description	2010 Jobs	2020 Jobs	Annual Openings	2010 Hourly Earnings	2010 Annual Earnings 2,080 Work Hours
Health Care Technologists and Technicians, All Other	84	96	1	\$15.12	\$31,449.60
TOTAL	84	96	1	\$15.12	31,449.60

Table 4: Occupational Change

Description	Regional Change	Regional % Change	State % Change	National % Change
Health Care Technologists and Technicians, All Other	12	14.29%	23.17%	20.00%

ARTICULATION

Because of the specific nature of the Polysomnography Technology program, there are not articulated courses from a Secondary Career Pathway programs.

TECHNICAL SKILLS ASSESSMENT

Colleges should report the following for students who complete the program with a career certificate, technical certificate, or an Associate of Applied Science Degrees for technical skills attainment:

Certified Polysomnographic Technician (CPSGT) Examination
<http://www.brpt.org/default.asp?contentID=43>

ONLINE AND BLENDED LEARNING OPPORTUNITIES

Course content included lecture and laboratory semester credit hours. Faculty members are encouraged to present lecture related content to students in an online or blended learning environment. Training related to online and blended learning will be available to faculty members through the MS Community College Board.

INSTRUCTIONAL STRATEGIES

Throughout the first and second year of implementation of this curriculum, Instructors will develop instructional strategies and course content using the Canvas Learning Management System. Instructional strategies developed will be shared with all colleges who adopt this curriculum.

ASSESSMENT STRATEGIES

Throughout the first and second year of implementation of this curriculum, Instructors will develop assessment strategies and course content using the Canvas Learning Management System. Instructional strategies developed will be shared with all colleges who adopt this curriculum.

CREDIT BY EXAMINATION

The Polysomnography curriculum is written to CAAHEP accreditation standards; therefore, state-level credit by examination is not offered.

SUMMARY OF CURRICULUM REVISION CHANGES

The Polysomnography Technology curriculum is a new program. Changes will be documented in following revisions.

PROGRAM DESCRIPTION

The Polysomnography Technology program includes three award levels. The Career and Technical Certificates in Polysomnography are fast paced technical and clinical training. The Associates of Applied Science in Polysomnography combines general education with technical and clinical training. All award levels prepare the successful graduate to work as a polysomnographic technician performing diagnostic studies to evaluate sleep related disorders and conditions as well as assisting physicians in therapeutic modalities. Students will learn the skills needed to perform quality sleep studies; the knowledge of major sleep disorders; and the interventions to assist patients in attaining more healthful sleep.

Students in good standing are eligible and required to take the Certified Polysomnographic Technician (CPSGT) examination prior to program completion, which complies with the intermediate workplace standards for polysomnographic technicians and prepares the graduate to take the Registered Polysomnographic Technologist (RPSGT) exam, which complies with the highest workplace standards for Polysomnographic Technologist.

The goal is to prepare graduates to evaluate and assist in diagnosing sleep disorders such as sleep apnea, narcolepsy, cataplexy, and insomnia. Parasomnias, such as night terrors, bedwetting, sleep-eating, and sleepwalking, are also viewed by polysomnographers. Students are trained to conduct various testing with a range of equipment. From performing an electroencephalography, which charts brain activity to observing a patient's respiratory function, there are many technologies and techniques that polysomnography technology students must master.

SUGGESTED COURSE SEQUENCE

Career Certificate Required Courses

Course Number	Course Name	Semester Credit Hours	SCH Breakdown			Total Clock Hours	Clock Hour Breakdown			Certification Information
			Lecture	Lab	Intern-ship		Lecture	Lab	Intern-ship	
BIO 2513	*Anatomy & Physiology I	3	3			45	45			
BIO 2511	*Anatomy & Physiology Lab	1		2		60		60		
BIO 2523	*Anatomy & Physiology II	3	2			30	30			
BIO 2521	*Anatomy & Physiology Lab II	1		2		60		60		
PSG 1116	Introduction to Polysom	6	4	4		180	60	120		
PSG 1113	Polysom Pathophysiology	3	3			45	45			
PSG 1123	Polysom Technology	3	3			45	45			
PSG 2214	PSG Scoring and Analysis	4	4			60	60			
PSG 2218	Clinical Application I	8			24	1080			1080	
TOTAL		32	19	8		1605	285	240	1080	

*Pre-requisites: Must be completed prior to admission into the Polysomnography Program.

Technical Certificate Required Courses

Course Number	Course Name	Semester Credit Hours	SCH Breakdown			Total Clock Hours	Clock Hour Breakdown			Certification Information
			Lecture	Lab	Intern-ship		Lecture	Lab	Intern-ship	
PSG 2132	Professional Transitions	2	2			30	30			Certified Polysomnographic Technician (CPSGT) Examination
PSG 2224	PSG Capstone	4	4			60	60			
PSG 2227	Clinical Application II	7			21	945			945	
Total		13	6		21	1035	90		945	

General Education Core Courses

To receive the Associate of Applied Science Degree, a student must complete all of the required coursework found in the suggested course sequence, and a minimum of 15 semester hours of General Education Core. The courses in the General Education Core may be spaced out over the entire length of the program so that students complete some academic and Career Technical courses each semester or provided primarily within the last semester. Each community college will specify the actual courses that are required to meet the General Education Core Requirements for the Associate of Applied Science Degree at their college. The Southern Association of Colleges and Schools (SACS) Commission on Colleges Standard 2.7.3 from the Principles of Accreditation: Foundations for Quality Enhancement¹ describes the general education core.

1

Southern Association of Colleges and Schools Commission on Colleges. (2012). *The principles of accreditation: Foundations for quality enhancement*. Retrieved from <http://www.sacscoc.org/pdf/2012PrinciplesOfAccreditation.pdf>

Section 2.7.3 In each undergraduate degree program, the institution requires the successful completion of a general education component at the collegiate level that (1) is substantial component of each undergraduate degree, (2) ensures breadth of knowledge, and (3) is based on a coherent rationale. For degree completion in associate programs, the component constitutes a minimum of 15 semester hours or the equivalent. These credit hours are to be drawn from and include at least one course from the following areas: humanities/fine arts, social/behavioral sciences, and natural science/mathematics. The courses do not narrowly focus on those skills, techniques, and procedures specific to a particular occupation or profession.

Note: The elective requirements for the program of study are a local college decision. The type of electives and number of electives are determined by the college and should be based on industry need, accreditation standards, and adopted industry certifications. Elective credit is optional for colleges to include in their college catalog or bulletin. All that is required at the state-level is the technical core courses and state-wide agreed upon pre-requisites. All other program requirements are decided at the local level based on SACS-COC accreditation, program accreditation, and local business and industry need.

CAREER CERTIFICATE REQUIRED COURSES

Course Number and Name: PSG 1113 Polysomnography Pathophysiology

Classification: Technical Certificate Core Requirement

Description: This course provides a concentrated study of anatomy and physiology and an in-depth study of human pathological processes and their effects on homeostasis. Emphasis is placed on the physiology of the nervous, cardiovascular, and pulmonary systems and basic pharmacological principles as well as the interrelationships among organ systems in deviations from homeostasis. Upon completion, students should be able to demonstrate a detailed knowledge of sleep pathophysiology.

Hour Breakdown:

Semester Credit	Lecture	Lab	Clock
3	3	0	45

Prerequisite: None

Student Learning Outcomes:

1. Demonstrate knowledge of anatomy and physiology of the cardiovascular system and the effect it has on sleep.
 - a. Explain how the blood flows through the heart.
 - b. Discuss the importance of proper blood flow.
 - c. Demonstrate the ability to take a manual blood pressure reading.
 - d. Differentiate between lethal and non-lethal ECG dysrhythmias.
 - e. Explain each type of ECG rhythms.
2. Demonstrate knowledge of anatomy and physiology of the respiratory system and the effect it has on sleep.
 - a. Explain the mechanics of breathing.
 - b. Explain the anatomic locations of the collapsible portions of the upper airway.
3. Demonstrate knowledge of anatomy and physiology of the nervous system and the effect it has on sleep.
 - a. Explain the many structures of the brain.
 - b. Demonstrate knowledge of brain activity and how it affects sleep stages.
4. Demonstrate knowledge of pharmacology and the effect it has on sleep. DOK1, PSG VI-1
 - a. Explain how prescription medicines affect sleep stages.
5. Demonstrate knowledge of pathophysiology of sleep disorders (non-respiratory).
 - a. Identify the major categories of sleep disorders according to the International Classification of Sleep Disorders.
 - b. Describe signs and symptoms associated with major categories of sleep and arousal disorders.
 - c. Summarize the major categories of sleep and arousal disorders based on age-specific criteria.
 - d. Describe the most commonly encountered sleep disorders in infants and children.
 - e. Describe the most commonly encountered sleep disorders in the elderly.
 - f. Understand the varieties of treatments of sleep disorders.

6. Demonstrate knowledge of pathophysiology of sleep disorders (respiratory).
 - a. Identify the major categories of sleep disorders according to the International Classification of Sleep Disorders.
 - b. Describe signs and symptoms associated with major categories of sleep and arousal disorders.
 - c. Summarize the major categories of sleep and arousal disorders based on age-specific criteria.
 - d. Describe the most commonly encountered sleep disorders in infants and children.
 - e. Describe the most commonly encountered sleep disorders in the elderly.

7. Demonstrate knowledge of treatment of sleep disorders (respiratory).
 - a. Explain the application of PAP devices for sleep-related breathing disorders.
 - b. Explain the application of oxygen for sleep-related breathing disorders.
 - c. Summarize the concomitant use of PAP devices and oxygen for sleep-related breathing disorders.
 - d. Explain the principles of correct PAP titration techniques.
 - e. Explain the principles of correct oxygen titration techniques.
 - f. Explain the contraindications for PAP.
 - g. Explain the complications of PAP.
 - h. Explain the contraindication for oxygen therapy.
 - i. Explain the complications of oxygen therapy.
 - j. Give examples of responses to complications of PAP.
 - k. Give examples of complications of oxygen therapy.
 - l. Give examples of responses to complications of combined PAP and oxygen therapy.
 - m. Demonstrate an appropriate PAP mask fitting.

Course Number and Name: PSG 1116 Introduction to Polysomnography

Classification: Technical Certificate Core Requirement

Description: This course introduces the polysomnography profession. Topics include the history of the profession and the role of the polysomnographic technologist, communication, time management, infection control, basic patient assessment, and medical gas therapy. Upon completion, students should be able to demonstrate competence in concepts through written and laboratory evaluations.

Hour Breakdown:

Semester Credit	Lecture	Lab	Clock
6	4	4	180

Prerequisite: None

Student Learning Outcomes:

1. Summarize general preparation and safety guidelines for patients and polysomnographic technologists.
 - a. Identify emergency equipment and location.
 - b. Identify locations of emergency exits.
 - c. Describe appropriate process for accessing EMS.
 - d. Demonstrate knowledge of HIPAA protections and patient confidentiality.
 - e. Describe appropriate measures for assuring patient confidentiality and patient rights (such as the right to refuse treatment).
 - f. Demonstrate knowledge of professional/ethical behavior, conduct appropriate conversations, and follow policies and procedures.
 - g. Establish patient rapport, interact appropriately, and make patient comfortable with the procedure.
 - h. Demonstrate knowledge of infection control and universal precautions, utilize hand washing procedures, and use gloves appropriately.
 - i. Utilize appropriate infection control procedures.
 - j. Demonstrate knowledge of equipment including electrode and sensor cleaning and maintenance, and clean items appropriately to assure disinfection.
 - k. Perform chart review of history and physical, and review chart prior to testing.
 - l. Review and assure completeness of questionnaires.
 - m. Conduct an appropriate and complete patient interview to include: sleep history, sleep patterns, typical sleep routine, symptoms, caffeine and medication intake, and sleep complaints.
 - n. Evaluate patient and adjust approach to meet individual learning, communication and other needs to include readiness to learn/mental age, ability to communicate, and physical, emotional and cultural needs.
 - o. Make appropriate age specific adjustments in education, recording and documentation and scoring processes to include patient/caregiver education, equipment, montage and parameter adjustments, recording and documentation adjustments, and scoring adjustments.
 - p. Verify documentation is appropriate by ensuring documentation is legible, complete, signed, and dated.
2. Manage patient and equipment orientation.
 - a. Adhere to orientation process greet patient appropriately and verify identity.
 - b. Orient the patient based on age and physical needs such as patient room layout and amenities, call bell/intercom, patient bathroom, patient kitchen, medication storage and access, patient belongings storage area, and appropriate exit in case of emergency.
 - c. Provide an age appropriate explanation of the testing procedure.

- d. Demonstrate the ability to utilize and ability to verbalize the function of the following equipment:
 - (1) Polygraph
 - (2) Oximeter and/or capnograph
 - (3) Audio/video equipment
 - (4) Reusable/disposable electrodes
 - (5) Thermistors/thermocouples/pressure
 - (6) Transducers
 - (7) Effort sensors
 - (8) Cannulas (pressure monitoring, oximetry, O2 delivery, dual purpose)
 - (9) Snoring sensors
 - (10) Miscellaneous sensors (body position sensor, enuresis pads, and sensors)

3. Prepare and demonstrate the acquisition system.
 - a. Define the AASM recommended recording parameters for standard PSG.
 - b. Define and demonstrate bipolar and referential montages.
 - c. Describe routine montages (PSG, MSLT, MWT, PSG with PAP, seizure, parasomnia) and modifications for specific montage types (i.e. additional EEG leads for seizure montage).
 - d. Define and demonstrate the principles related to minimum sampling rates for various signals.
 - e. Define and demonstrate appropriate high and low frequency filter settings for various signals.
 - f. Define and demonstrate appropriate sensitivity/gain settings for various signals.
 - g. Demonstrate the ability to change the epoch display size.
 - h. Demonstrate the ability to perform appropriate equipment calibrations.
 - i. Describe and demonstrate the minimum requirements for audio/visual recording during PSG.
 - j. Demonstrate the ability to interface an external oximeter/capnograph.
 - k. Demonstrate the ability to calibrate an oximeter or capnograph to the PSG system.

4. Demonstrate appropriate electrode application using AASM standards.
 - a. Accurately measure and mark EEG electrode placements according to the International 10-20 System of Electrode Placement.
 - b. Demonstrate accurate placement of EEG electrodes, including system reference and ground electrodes, within 0.5 cm of standard measurements.
 - c. Demonstrate accurate placement of ECG electrodes for a lead II recording.
 - d. Demonstrate accurate placement of E1 and E2 EOG electrodes according to AASM standards.
 - e. Demonstrate accurate placement of chin EMG electrodes according to AASM standards.
 - f. Demonstrate accurate placement of leg EMG electrodes according to AASM standards.
 - g. Demonstrate accurate placement of thermistor/thermocouple.
 - h. Demonstrate accurate placement of PTAF cannula.
 - i. Demonstrate accurate placement of effort belts.
 - j. Demonstrate accurate placement of SpO2 sensor.
 - k. Utilize site preparation agents appropriately.
 - l. Describe or demonstrate paste and/or collodion application methods.
 - m. Describe the rationale behind the International 10-20 System of Electrode Placement measurements and the importance of measuring electrode placements.
 - n. Articulate AASM standards for placement of other electrodes and recording devices.
 - o. Demonstrate the ability to manage wires and sensors to assure patient comfort during the recording.

5. Perform and document PSG recording & monitoring.
 - a. Accurately perform and document instrument calibrations.
 - b. Perform and document patient calibrations, making necessary adjustments.
 - c. Provide appropriate patient instructions for the recording and inform patient of how to contact the technologist during the night.

- d. Accurately document lights out.
 - e. Monitor EEG to assure quality of signals.
 - f. Accurately identify sleep stages.
 - g. Accurately identify sleep onset, arousals, awakenings, and sleep fragmentation.
 - h. Assure adequate function of airflow signals.
 - i. Evaluate accuracy of oxygen saturation and carbon dioxide monitoring signals.
 - j. Identify limb movements.
 - k. Assure adequacy of respiratory effort signals.
 - l. Monitor ECG for arrhythmias.
 - m. Consistently document at appropriate intervals and with all position and instrumentation changes throughout the recording.
 - n. Perform and document lights on procedure appropriately.
 - o. Complete appropriate post-recording calibrations.
 - p. Document an accurate summary of the night's recording.
 - q. Demonstrate the ability to save, transfer, and archive files according to established protocols.
6. Demonstrate ability to recognize and respond to clinical events.
- a. Identify the major categories of sleep disorders according to the International Classification of Sleep Disorders.
 - b. Describe signs and symptoms associated with major categories of sleep and arousal disorders.
 - c. Summarize the major categories of sleep and arousal disorders based on age-specific criteria.
 - d. Describe the most commonly encountered sleep disorders in infants and children.
 - e. Describe the most commonly encountered sleep disorders in the elderly.
7. Demonstrate the ability to recognize and respond to technical and patient events.
- a. Recognize and correct artifacts in the recording.
 - b. Demonstrate ability to troubleshoot equipment, determine source of artifact or equipment malfunction and make appropriate adjustments.
 - c. Demonstrate ability to identify and correct patient generated artifact.
 - d. Identify and document recording variances caused by medication effect (e.g. Prozac eyes, increased spindle activity).
 - e. Demonstrate the ability to handle difficult situations with patients professionally.

Course Number and Name: PSG 1123 Polysomnography Technology

Classification: Technical Certificate Core Requirement

Description: This course introduces the fundamental concepts of electricity and test equipment in the field of Polysomnography. Topics include basic DC and AC principles (voltage, resistance, current, and impedance), components (resistors, inductors, and capacitors), power, and operation of test equipment.

Hour Breakdown:

Semester Credit	Lecture	Lab	Clock
3	3		45

Prerequisite: None

Student Learning Outcomes:

1. Demonstrate the knowledge of the principles of electrical conduction and safety.
 - a. Explain basic electricity and magnetic, electrical conduction, polarity, conductors, resistors, capacitors, transistors, insulators, Ohm's law, sensitivity, filters, circuits, AC amplifiers, DC amplifiers, differentials amplifiers, signal multiplexers, and common mode rejection.
 - b. Demonstrate the understanding of basic AC/DC instrumentation.
 - c. Summarize the process of measuring the electromechanical functions of the human body, including extra-cellular potentials created by cardiac, brain, muscle, and integumentary.
 - d. Explain and demonstrate principles of the function and handling of electrodes, electrolytic substances, and fixatives.
 - e. Explain the frequency and voltage characteristics of EEG, EOG, EMG, and ECG.
 - f. Explain and demonstrate impedance measurements and impedance meters.
 - g. Prepare sample montages indicating the channel derivation and how they differ for referential and bipolar recordings.
 - h. Explain signal calibration, electrical baseline, and mechanical baseline.
 - i. Discuss the origins of artifact and demonstrate artifact elimination.
 - j. Summarize the effect of different time bases on the PSG signal display.
 - k. Summarize and demonstrate the principles of electrical safety.

2. Demonstrate the knowledge of montage including signal derivation and amplification.
 - a. Explain and demonstrate the principles of signal calibration as they pertain to digital and analog recording systems, and substandard signal calibrations.
 - b. Explain and demonstrate the principles of evaluating impedance and the use of impedance meters.
 - c. Explain and perform the principles of physiological calibration.
 - d. Explain and perform the principles of troubleshooting electrical and mechanical problems.
 - e. Explain and demonstrate the principles of alteration of amplifier settings.
 - f. Explain and demonstrate the principles of derivation alteration.
 - g. Demonstrate the knowledge and application of signal processing (filter, sensitivity) & calibrations.

3. Apply and demonstrate the knowledge of the AASM Scoring Manual as follows:
 - a. Visual Rules
 - b. Arousal Rules
 - c. Cardiac Rules
 - d. Movement Rules
 - e. Respiratory Rules
 - f. Data Analysis and Report Generation
 - g. Archiving and Data Storage

Course Number and Name: PSG 2214 PSG Scoring & Analysis

Classification: Technical Certificate Core Requirement

Description: This course provides an intermediate level of scoring and data analysis for polysomnographic testing. Students will learn the procedures necessary to generate and validate a report of the scoring of objective and subjective data obtained in a polysomnographic study.

Hour Breakdown:

Semester Credit	Lecture	Lab	Clock
4	4		60

Prerequisite: PSG 1116- Introduction to Polysom; PSG 1113- Polysom Pathophysiology; PSG 1123- Polysom Technology

Student Learning Outcomes:

1. Identify and demonstrate general scoring skills.
 - a. Demonstrate the ability to identify characteristic waveforms of sleep, wakefulness, and artifact.
 - b. Identify the need for manual review of all computerized scoring.

2. Comprehend and demonstrate all scoring rules.
 - a. Demonstrate the ability to identify and apply AASM visual scoring rules.
 - b. Demonstrate the ability to identify and apply AASM arousal rules.
 - c. Demonstrate the ability to identify respiratory events and apply AASM respiratory scoring rules.
 - d. Demonstrate the ability to identify and apply AASM movement event rules.
 - e. Demonstrate the ability to identify and apply AASM cardiac scoring rules.

3. Understand and demonstrate proper perimeters for report generation.
 - a. Demonstrate ability to generate an accurate report that includes all AASM required parameters.
 - b. Demonstrate ability to verify report calculations.
 - c. Demonstrate ability to verify complete and accurate demographic information.
 - d. Demonstrate ability to generate and verify accuracy of a hypnogram.

4. Demonstrate the use of the inter-scorer reliability format.
 - a. Demonstrate the ability to maintain an epoch by epoch correlation of 85% or better with the reference scorer for sleep stages, arousals, respiratory events, and limb movements.

Course Number and Name: PSG 2218 Clinical Applications I

Classification: Technical Certificate Core Requirement

Description: This introductory clinical course will have the students prepare patients for polysomnographic monitoring in the clinical setting. Emphasis will be placed on patient care and safety in the setting of a sleep laboratory, as well as preparation and initiation of routine polysomnographic testing in patients of all ages. The student will begin the experience of off-campus practicum at local sleep centers. This will provide the students with an environment that will encourage professional role development and clinical problem-solving skills.

Hour Breakdown:

Semester Credit	Lecture	Clinical	Clock
8		24	1080

Prerequisite: PSG 1116- Introduction to Polysom; PSG 1113- Polysom Pathophysiology; PSG 1123- Polysom Technology

Student Learning Outcomes:

1. Utilize age specific guidelines to care and evaluate patients.
 - a. Provide information and instruction to the patient (parent/guardian, pediatric, adolescent, adult, geriatric and/or caregiver) appropriate for full understanding of the procedure.
 - b. Allow the patient (and the parent, guardian, caregiver, if applicable) to prepare for the sleep study; interact appropriately with the patient and family members.
 - c. Access and incorporate the patient's life situations, home environment, responsibilities, religious and cultural background, and available resources into their care while in the sleep center. Make adjustments to recording montage, parameters, procedures, and documentation to accommodate age and health status.
 - d. Recognize physiological and psychological changes that affect care of the patient; provide for patient's physical needs during the sleep study.
 - e. Recognize physical/psychological indicators of abuse/neglect and notify appropriate authorities.
 - f. Apply age appropriate safety measures.

2. Demonstrate use of pulse oximeters.
 - a. Demonstrate knowledge of operation of pulse oximeter devices; ability to adjust sampling rate/trend settings.
 - b. Demonstrate ability to calibrate pulse oximeter device to polygraph as appropriate to acquisition equipment.
 - c. Explain the use of pulse oximetry to patient during pre-testing procedure; utilize communication skills appropriate to patient age and physical/mental abilities.
 - d. Demonstrate ability to appropriately apply reusable or disposable pulse oximeter sensor allowing for patient comfort, compliance, and accurate data acquisition.
 - e. Demonstrate ability to recognize when improper sensor placement is affecting oximeter reading.
 - f. Identify the limitations of the patient monitoring device; recognize artifact in pulse rate and/or oximetry reading during procedure.
 - g. Recognize and document low baseline saturation levels during procedure.
 - h. Recognize and demonstrate desaturation related to respiratory and other events; identify and document corresponding event characteristics (i.e., respiratory, cardiac, sleep state, etc.) during procedure.
 - i. Verify the accuracy of pulse oximetry reading obtained during NREM and REM sleep.
 - j. Document oxygen saturation levels during PSG on polygraph and technical note forms.

3. Orient patient to the diagnostic procedure and safety issues.
 - a. Explain procedure to patient in an age appropriate manner.
 - b. Identify impact of patient's physical/mental limitations on the outcome of the procedure.
 - c. Verbalize protocol for contacting the Medical Director.
 - d. Identify when to use supplemental oxygen due to low oxygen saturation levels.
 - e. Demonstrate knowledge of possible side effects of supplemental oxygen therapy.
 - f. Identify signs that patient's drive to breathe is diminished and corrective actions that need to be implemented if patient's drive to breathe is affected.
 - g. Verify optimal supplemental oxygen level during all sleep stages.
 - h. Demonstrate knowledge of equipment maintenance procedures.
 - i. Demonstrate handling, cleanup, and storage of hazardous materials (ex. Collodion)

4. Illustrate standard infection control precautions, equipment disinfection, and environmental cleaning procedures.
 - a. Demonstrate appropriate cleaning and disinfection of permanent interface devices.
 - b. Demonstrate proper disposal of single patient use nasal cannulas, oxygen tubing, and/or oxygen masks.
 - c. Demonstrate knowledge of appropriate cleaning and disinfection of non-disposable items and disposal of single use sensors.
 - d. Demonstrate appropriate procedures for cleaning reusable devices used during oxygen titration.
 - e. Demonstrate standard hand washing.
 - f. Demonstrate proper disinfection of hard surfaces within patient environment and technologist control room.
 - g. Remove soiled linen and replace with clean linen.

5. Demonstrate appropriate patient assessment, application of oxygen, titration, and documentation.
 - a. Review the patient's history and physical and physician orders to determine the need for supplemental oxygen.
 - b. Assess patient's need for supplemental oxygen upon arrival in the sleep center using an oximeter.
 - c. Assess patient's need for supplemental oxygen during polysomnography using an oximeter.
 - d. Validate accuracy of oximeter reading.
 - e. Verify correct function of oxygen concentrator and/or flow meter.
 - f. Describe routine maintenance of device filters.
 - g. Demonstrate ability to regulate oxygen flow.
 - h. Demonstrate ability to fit and adjust a nasal cannula for oxygen delivery.
 - i. Demonstrate ability to entrain supplemental oxygen in PAP circuit, with and without humidification devices.
 - j. Identify when to adjust supplemental oxygen to achieve optimal saturation level according to facility protocol.
 - k. Identify events (i.e., respiratory desaturations that do not respond to PAP therapy, cardiac, sleep stage, etc.) indicating a need to implement supplemental oxygen.
 - l. Identify when to add supplemental oxygen therapy during PAP therapy according to facility protocol.
 - m. Document changes in oxygen levels during PSG in the sleep system and on technical note forms.
 - n. Identify, document, and correct equipment problems.

TECHNICAL CERTIFICATE REQUIRED COURSES

Course Number and Name: **PSG 2227 Clinical Applications II**

Classification: Technical Certificate Core Requirement

Description: This advanced clinical course will have the students apply previously learned theoretical concepts and skills in Polysomnography, to include advanced PAP titration. Emphasis will be placed on patient care and safety, as well as preparation, initiation and completion of routine polysomnographic testing in patients of all ages. The student will continue the experience of off-campus practicum at local sleep centers. This will provide the students with an environment that will encourage professional role development and clinical problem-solving skills.

Hour Breakdown:

Semester Credit	Lecture	Clinical	Clock Hours
7		21	945

Prerequisite: PSG 1116- Introduction to Polysom; PSG 1113- Polysom Pathophysiology; PSG 1123- Polysom Technology; PSG 2214- PSG Scoring and Analysis; PSG 2218- Clinical Application I

Student Learning Outcomes:

1. Demonstrate use of PAP equipment operation.
 - a. Demonstrate knowledge of operation of all PAP and humidification devices within the center; assure proper equipment function.
 - b. Demonstrate knowledge of PAP-PSG equipment interfaces and remote operation of PAP devices.
 - c. Demonstrate knowledge of appropriate use of an auto-titrating PAP device in the sleep center.
 - d. Demonstrate knowledge of sleep center PAP titration protocols.
 - e. Demonstrate ability to properly fit a PAP mask or other interface that meets patient needs for optimum comfort and compliance.
 - f. Adjust and fit appropriate headgear.
2. Orient patient to PAP procedure.
 - a. Explain PAP titration procedure to patient demonstrating appropriate age-specific communication skills.
 - b. Identify the impact of the patient’s age and physical/mental limitations on the outcome of the procedure.
 - c. Respond to patient questions or concerns.
3. Demonstrate proper PAP titration and appropriate documentation.
 - a. Demonstrate knowledge of possible complications and side effects of PAP therapy.
 - b. Recognize when a patient is unable to tolerate PAP therapy.
 - c. Demonstrate ability to identify excessive volume leakage related to mouth breathing or mask leak and make appropriate interventions.
 - d. Identify and document clinical events and causes (i.e. respiratory, arousals, cardiac events.)
 - e. Identify and document sleep fragmentation related to respiratory events and snoring.
 - f. Identify and document when to adjust PAP to achieve optimal therapeutic level (i.e. eliminate respiratory events, desaturation, arousals and snoring).
 - g. Identify and document event characteristics demonstrating a need to change PAP mode.
 - h. Identify when to discontinue PAP therapy due to complications or patient intolerance.
 - i. Verbalize the protocol for contacting the Medical Director.

- j. Verify and document optimal pressure during supine and stage R sleep.
 - k. Document the epoch number/time of each PAP pressure change appropriately in the recording.
 - l. Document reasons for all changes in PAP levels or other settings during the PSG.
 - m. Document a summary of the titration on the recording or technical note form.
 - n. Identify, document, and correct equipment problems.
4. Illustrate standard infection control precautions, equipment disinfection, and environmental cleaning procedures.
- a. Demonstrate knowledge of equipment maintenance procedures.
 - b. Demonstrate knowledge of appropriate cleaning and disinfection of non-disposable items and disposal of single use sensors.
 - c. Demonstrate appropriate cleaning and disinfection of permanent interface devices.
 - d. Demonstrate proper disposal of single patient use nasal cannulas, oxygen tubing, and/or oxygen masks.
 - e. Demonstrate appropriate procedures for cleaning reusable devices used during oxygen titration.
 - f. Demonstrate standard hand washing.
 - g. Demonstrate proper disinfection of hard surfaces within patient environment and technologist control room.
 - h. Remove soiled linen and replace with clean linen.
5. Verbalize and demonstrate CO2 Monitoring.
- a. Demonstrate knowledge of the proper operation and calibration of EtCO₂/TcCO₂ device.
 - b. Demonstrate ability to identify equipment problems and to interface EtCO₂/TcCO₂ monitoring devices with the polygraph.
 - c. Demonstrate ability to fit nasal cannula for patient comfort and compliance.
 - d. Demonstrate knowledge of appropriate sites for application of TcCO₂ electrode and proper application of sensor.
 - e. Explain EtCO₂/TcCO₂ procedure to patient during pre-testing procedure; utilize communication skills appropriate to patient age and physical/mental abilities.
 - f. Describe basic theory of EtCO₂/TcCO₂ Monitoring.
 - g. Demonstrate knowledge of normal values for EtCO₂/TcCO₂ and factors that can affect observed values.
 - h. Document changes in EtCO₂/TcCO₂ noted during PSG on polygraph and in technical notes.
 - i. Identify when to change the TcCO₂ site based on electrode temperatures.

Course Number and Name: PSG 2132 Professional Transition

Classification: Technical Certificate Core Requirement

Description: This course builds on previous knowledge and skills applicable to the practice of professional polysomnography. This course provides an overview of professional concepts basic to the development of professionalism in polysomnography. Emphasis is placed on changes in the health care environment and the impact on the professional polysomnographer's role. Accountability and responsibility issues as they relate to professional polysomnography are discussed. The students will begin the development of a professional portfolio for use throughout the curriculum and in the professional practice settings.

Hour Breakdown:

Semester Credit	Lecture	Lab	Clock
2	2		30

Prerequisite: PSG 1116- Introduction to Polysom; PSG 1113- Polysom Pathophysiology; PSG 1123- Polysom Technology; PSG 2214- PSG Scoring and Analysis; PSG 2218- Clinical Application I

Student Learning Outcome:

1. Demonstrate the ability to:
 - a. Develop a resume.
 - b. Develop a resignation letter.
 - c. Communicate professionally verbally and written.
 - d. Perform a successful phone interview.
 - e. Perform a successful panel interview.
 - f. Identify professional attire and behavior.

Course Number and Name: PSG 2224 Polysomnography Capstone

Classification: Technical Certificate Core Requirement

Description: This course is designed to apply the essential elements of polysomnography through the use of case studies. Students develop an analytical approach to problem solving. Review of curriculum, test taking skills, and prepare the student for the Certified Polysomnographic Technicians exam and the Registered Polysomnographic Technologist exam.

Hour Breakdown:

Semester Credit	Lecture	Lab	Clock
4	4		60

Prerequisite: PSG 1116- Introduction to Polysom; PSG 1113- Polysom Pathophysiology; PSG 1123- Polysom Technology; PSG 2214- PSG Scoring and Analysis; PSG 2218- Clinical Application I

Student Learning Outcomes:

1. Illustrate an understanding of the registry exams.
 - a. Administer a mock registry exam.
 - b. Exhibit comfort with computer testing.
 - c. Complete the Certified Polysomnographic Technology Exam and the Registered Polysomnographic Exam.
2. Produces unbiased evaluations on case studies.
 - a. Uses and demonstrates critical thinking skills while critiquing various case studies.
 - b. Verbalize findings with the class, giving specific examples of conclusions.
3. Demonstrate accurate scoring techniques.
 - a. Score the case studies, using the AASM scoring rules and definitions.
 - b. Demonstrate scoring ability within at least 85%.

RECOMMENDED TOOLS AND EQUIPMENT

Capitalized Items

Access to some tools and equipment may be provided by Polysomnographic Technology Program facilities.

1. Emergency eyewash station (1)
2. Student computers with Internet access (20)
3. Printers (3)
4. Copy machine (1)
5. Polysomnography diagnostic software with infrared light and camera (i.e. SomnoStar, Alice, Grass, Cadwell) (4)
6. Desk top computer for laboratory (4)
7. Pulse oximeter monitor (4)
8. CPAP machine with humidifier (4)
9. Bed (4)
10. Bedside table (4)
11. Washing machine (1)
12. Dryer (1)
13. Portable monitor (2)
14. Actigraph
15. Air purifier (1)
16. Equipment dryer (1)
17. Oral appliance (1)
18. Two way audio monitoring system (4)
19. Scale (1)
20. Water column manometer (1)

Non-Capitalized Items

1. First aid kit (1)
2. Electrodes (150)
3. Pressure transducer (5)
4. Airflow sensor (5)
5. Snore sensor (5)
6. Respiratory effort sensor (10)
7. I.V. poles (4)
8. Instrument stand/chart (4)
9. CPAP Mask (30-variety)
10. CPAP tubing (8)
11. Glass head (20)
12. Wire tester (1)
13. Air pump (1)
14. Safety/ Fire proof cabinet
15. Bedding (8 sets)
16. T connector (5)
17. Chin Strap (10-variety)
18. Noise canceling machine (4)
19. Utility cart (1)
20. Blood pressure monitor (2)

Recommended Instructional Aids

It is recommended that instructors have access to the following items:

1. TV monitor, 25-in. color (1 per program)
2. DVD/Blu ray player (1 per program)
3. AV cart (1 per program)
4. Overhead projector (1 per program)
5. Projector screen (1 per program)
6. Data projector (1 per program)
7. Teacher computer with printer (2 per program)
8. White board (1 per program)
9. Mock PSG Exams
10. Online access to textbooks
11. Additional instructor aids included with textbooks
12. Standardized testing system to compile and administer tests and quizzes (1)
13. Educational pamphlets (variety)

CURRICULUM DEFINITIONS AND TERMS

- Course Name – A common name that will be used by all community colleges in reporting students
- Course Abbreviation – A common abbreviation that will be used by all community and junior colleges in reporting students
- Classification – Courses may be classified as the following:
 - Career Certificate Required Course – A required course for all students completing a career certificate.
 - Technical Certificate Required Course – A required course for all students completing a technical certificate.
 - Technical Elective – Elective courses that are available for colleges to offer to students.
- Description – A short narrative that includes the major purpose(s) of the course
- Prerequisites – A listing of any courses that must be taken prior to or on enrollment in the course
- Co-requisites – A listing of courses that may be taken while enrolled in the course
- Student Learning Outcomes – A listing of the student outcomes (major concepts and performances) that will enable students to demonstrate mastery of these competencies

The following guidelines were used in developing the program(s) in this document and should be considered in compiling and revising course syllabi and daily lesson plans at the local level:

- The content of the courses in this document reflects approximately 75% of the time allocated to each course. The remaining 25% of each course should be developed at the local district level and may reflect the following:
 - Additional competencies and objectives within the course related to topics not found in the state framework, including activities related to specific needs of industries in the community college district
 - Activities that develop a higher level of mastery on the existing competencies and suggested objectives
 - Activities and instruction related to new technologies and concepts that were not prevalent at the time the current framework was developed or revised
 - Activities that include integration of academic and career–technical skills and course work, school-to-work transition activities, and articulation of secondary and postsecondary career–technical programs
 - Individualized learning activities, including work-site learning activities, to better prepare individuals in the courses for their chosen occupational areas
- Sequencing of the course within a program is left to the discretion of the local college. Naturally, foundation courses related to topics such as safety, tool and equipment usage, and other fundamental skills should be taught first. Other courses related to specific skill areas and related academics, however, may be sequenced to take advantage of seasonal and climatic conditions, resources located outside of the school, and other factors. Programs that offer an Associate of Applied Science Degree must include all of the required Career Certificate courses, Technical Certificate courses **AND** a minimum of 15 semester hours of General Education Core Courses. The courses in the General Education Core may be spaced out over the entire length of the program so that students complete some academic and Career Technical courses each semester. Each community college specifies the actual courses that are required to meet the General Education Core Requirements for the Associate of Applied Science Degree at their college.
- In order to provide flexibility within the districts, individual courses within a framework may be customized by doing the following:

- Adding new student learning outcomes to complement the existing competencies and suggested objectives in the program framework.
- Revising or extending the student learning outcomes
- Adjusting the semester credit hours of a course to be up 1 hour or down 1 hour (after informing the Mississippi Community College Board [MCCB] of the change)