



**MERCER**  
COUNTY COMMUNITY COLLEGE

# COURSE OUTLINE

<b>Course Number</b> <b>PTA 214</b>	<b>Course Title</b> <b>Physical Agents</b>	<b>Credits</b> <b>3</b>
<b>Hours:</b> <b>Lecture/Lab/Other</b> <b>2/2/0</b>	<b>Co- or Pre-requisite</b>  <b>Pre-requisites: PTA 107; MAT 115 or MAT 140 or PTA program approved MAT equivalent with a minimum C grade (C+ if taken during or after Spring 2020)</b>	<b>Implementation Semester &amp; Year</b>  <b>Fall 2023</b>

**Catalog description:**

Study of biophysical agents and therapeutic modalities in physical therapy practice. Lab and lecture activities develop problem solving and critical thinking in the use of electrical stimulation, therapeutic heat, cold, traction, and hydrotherapy for therapeutic interventions. Competencies evaluated throughout the course.

**General Education Category:**  
Not GenEd

**Course coordinator:** ([Rachel Cordasco](mailto:CordascR@mccc.edu), 609-570-3385, [CordascR@mccc.edu](mailto:CordascR@mccc.edu))

**Required texts & Other materials:**

Cameron, M.,(2018) Physical Agents in Rehabilitation, 5<sup>th</sup> edition, St Louis, MO, Elsevier, ISBN 978-0-323-44567-2

**Course Student Learning Outcomes (SLO):**

Following the successful completion of this course with a grade of C+ or higher, the learner will be able to:

1. Safely and appropriately apply physical agents and electrical stimulation for the accomplishment of therapeutic treatment goals including: the reduction of pain, edema, joint stiffness and muscle guarding and increasing circulation, muscle strength and tissue extensibility.
2. Determine what the potential causes and remedies would be for undesirable patient responses to the application of physical agents and electrical stimulation for the accomplishment of therapeutic treatment goals and make appropriate decisions and adjustments in the application to maintain patient safety.
3. Critically discuss the available literature dealing with physical agents relating the relevance of what is published with current practice patterns in the clinical setting.
4. Differentiate between the advantages and disadvantages of a buoyant environment for a therapeutic exercise program versus a land environment for a patient who had partial weight bearing status.

## Course-specific Institutional Learning Goals (ILG):

**Institutional Learning Goal 1. Written and Oral Communication in English.** Students will communicate effectively in both speech and writing.

**Institutional Learning Goal 2. Mathematics.** Students will use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.

**Institutional Learning Goal 3. Science.** Students will use the scientific method of inquiry, through the acquisition of scientific knowledge.

**Institutional Learning Goal 4. Technology.** Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals.

**Institutional Learning Goal 9. Ethical Reasoning and Action.** Students will understand ethical frameworks, issues, and situations.

**Institutional Learning Goal 10. Information Literacy:** Students will recognize when information is needed and have the knowledge and skills to locate, evaluate, and effectively use information for college level work.

**Institutional Learning Goal 11. Critical Thinking:** Students will use critical thinking skills understand, analyze, or apply information or solve problems.

## Program Learning Outcomes for Physical Therapist Assistant Program (PLO)

		<u>ILGs:</u>	<u>Learning Objectives</u>
<u>Unit 1a</u>	From Injury to Repair: Pain and Inflammation	1, 2, 3, 4, 9, 10, 11	C8, C9, C10, P6, P11, A1, A2, A3, A7
<u>Unit 1b</u>	Observable responses to therapeutic treatment interventions	1, 2, 3, 4, 9, 10, 11	C2, C5, C6, C9, C10, P1, P4, P5, P9, P10, P11, A3, A7
<u>Unit 2</u>	Therapeutic Heat & Cold	1, 2, 3, 4, 9, 10, 11	C2, C3, C5, C6, P1, P2,
<u>Unit 3</u>	Therapeutic Ultrasound	1, 2, 3, 4, 9, 10, 11	C2, C3, C4, C5, C6, C7, C8, C10, P1, P7, P9, P10, P11
<u>Unit 4</u>	Foundations for Electrical Stimulation Physiologic Basis of Electrical Stimulation	1, 2, 3, 4, 9, 10, 11	C1, C7, C8, P10, A2
<u>Unit 5</u>	Neuromuscular Electrical Stimulation	1, 2, 3, 4, 9, 10, 11	C1, C3, C4, C5, C6, C7, P2, P8, P10
<u>Unit 6</u>	Pain Management with ES	1, 2, 3, 4, 9, 10, 11	C1, C3, C4, C5, C6, C7, C8, P2, P6, P8, P10
<u>Unit 7</u>	Electrical Stimulation Devices	1, 2, 3, 4, 9, 10, 11	C4, C5, C6, C7, C8, P2, P3, P7, P8, P10, P11, A2
<u>Unit 8</u>	Aquatics & Hydrotherapy	1, 2, 3, 4, 9, 10, 11	C13, C14, C15, P12,
<u>Unit 9</u>	Soft Tissue Treatment Techniques: Traction	1, 2, 3, 4, 9, 10, 11	C12, P12, A2, CG4
<u>Unit 10</u>	Modality Integration	1, 2, 3, 4, 9, 10, 11	C11, A1, A2, A3, A6, A7
<u>Unit 11</u>	<i>Presentations</i>	1, 2, 3, 4, 9, 10, 11	C14, C15, P12, CG5

## Units of study in detail – Unit Student Learning Outcomes:

### Cognitive/Knowledge

The learner will be able to successfully:

1. describe the properties of electricity (conductance, resistance, capacitance) and how this would impact the application of electrical stimulation with a patient

2. describe the mechanisms for heat transfer and how this applies to the application of heat or cold in different forms to patients
3. identify commonly accepted treatment goals for the application of physical agents & therapeutic modalities
4. identify the appropriate parameters required to accomplish treatment goals with electrical stimulation and ultrasound
5. cite potential adverse responses to the application of a therapeutic modality or physical agent and how to remedy those responses should they occur
6. outline the appropriate information necessary to document a treatment with physical agent or therapeutic modality
7. cite the indications, contraindications & precautions to the application of electrical stimulation, ultrasound, superficial and deep heating agents
8. describe the various pain pathways and potential ways to block pain perception utilizing physical agents and therapeutic modalities
9. describe the importance of pain as a perception and how pain may be indicated other than verbal by expressions
10. describe the expected visual and palpable responses of the skin to a therapeutic intervention with a physical agent modality
11. describe how two or more physical agents can be utilized together to accomplish a therapeutic treatment goal
12. describe the components of mechanical traction devices for spinal traction and provide the rationale for each of the those components and their therapeutic application to accomplish stated treatment goals
13. list the parts of a whirlpool for a therapeutic intervention with hydrotherapy, describing the variables and rationale for their selection
14. differentiate between an aquatic pool and a hydrotherapy tank for a therapeutic intervention with a patient stating advantages and disadvantages for both forms of treatment
15. describe the physical principles of water and how they may be used to in a therapeutic intervention with a patient to affect a positive outcome

### **Psychomotor**

The learner will be able to successfully:

1. display and explain the appropriate application techniques for therapeutic superficial and deep heat
2. demonstrate the appropriate application of therapeutic cold, light and electrical stimulation
3. describe the use of EMG biofeedback as a therapeutic intervention
4. respond appropriately to unexpected physiologic responses to a therapeutic intervention with a physical agent
5. demonstrate and defend the importance of proper patient positioning and draping techniques
6. perform pain assessment skills for treatment documentation
7. describe the rationale for the selection of physical agents and therapeutic modalities based on clinical goals and patient responses
8. perform the application of electrical stimulation to accomplish: pain reduction, muscle guarding reduction, and a motor response
9. document treatment techniques for physical agents and therapeutic modalities in SOAP format
10. recognize, respond and document normal and abnormal responses to treatment interventions with physical agents and therapeutic modalities
11. assess patient sensation prior to and after the application of a physical agent or therapeutic modality and determine what types of responses need to be documented in the patient's chart and how they should be documented
12. prepare a patient for the therapeutic application of hydrotherapy or spinal traction to accomplish a stated treatment goal

## **Affective**

The learner will be able to successfully:

### A1. Receive Phenomenon

- A1.1 Listen to others with respect
- A1.2 Receive feedback professionally
- A1.3 Attend class consistently
- A1.4 Arrive to all classes and clinicals prior to the start time

### A2. Respond to Phenomenon

- A2.1 Participate in class
- A2.2 Know the safety rules and practice them
- A2.3 Respond to feedback in a professional manner
- A2.4 Prepare for lectures, labs and clinicals ahead of time

### A3. Value

- A3.1 Demonstrate sensitivity to individual and cultural differences
- A3.2 Show an ability to solve problems
- A3.3 Inform PTAP faculty of matters one feels strongly about

### A4. Organize

- A4.1 Recognize the need for balance between educational and personal priorities
- A4.2 Accept professional ethical standards, as evidenced by following them
- A4.3 Prioritize times effectively to meet educational and personal needs
- A4.4 Complete and submit all assignments, assessments, and required documents on time

### A5. Internalize

- A5.1 Show self-reliance when working independently
- A5.2 Cooperate in group activities
- A5.3 Revise judgments and changes behavior in light of new evidence and feedback
- A5.4 Value people for who they are, not how they look
- A5.5 Identify sources of stress and implement effective coping behaviors
- A5.6 Demonstrate a commitment to the physical therapy profession

## **Evaluation of student learning:**

<b>% of grade</b>	<b>Activity</b>	<b># per semester</b>
30	Exams	3
15	Presentations	1
5	Class/lab participation	Continuous
20	Competency Tests	4
30	Practical Exam	1