## Course Change Proposal

### Form A

<table>
<thead>
<tr>
<th>Academic Group (College):</th>
<th>Academic Organization (Department):</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health and Human Services</td>
<td>Physical Therapy</td>
<td>2/8/2011</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of Course Proposal:</th>
<th>Department Chair:</th>
<th>Submitted by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>New ___ Change x___ Deletion ___</td>
<td>Dr. McGinty</td>
<td>Dr. McKeough</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Does this course fulfill a requirement for single-subject or multiple subject credential students?</th>
<th>For Catalog Copy:</th>
<th>Semester Effective:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes ___ No x___</td>
<td>Yes x___ No ___</td>
<td>Fall X___ Spring 2012</td>
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<table>
<thead>
<tr>
<th>CCE (Extension):</th>
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<tr>
<td>Yes ___ No x___</td>
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This course replaces experimental course Subject Area (**prefix**) and Catalog Nbr (**course number**):

<table>
<thead>
<tr>
<th>If changing an existing course, should new version be considered a repeat of the original version? If so, the same Course ID will be maintained. If not, a new Course ID will be assigned. Note: In PeopleSoft terminology, the Course ID is the unique system identifier, not the Catalog Nbr.</th>
</tr>
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<tbody>
<tr>
<td>Yes ___ No ___</td>
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</table>

### Change from:

<table>
<thead>
<tr>
<th>Subject Area (<strong>prefix</strong>) &amp; Catalog Nbr (<strong>course no.</strong>):PT226</th>
<th>Title:</th>
<th>Units:</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT226</td>
<td>Therapeutic Agents</td>
<td>3</td>
</tr>
</tbody>
</table>

### Change to:

<table>
<thead>
<tr>
<th>Subject Area (<strong>prefix</strong>) &amp; Catalog Nbr (<strong>course no.</strong>):PT 626</th>
<th>Title:</th>
<th>Units:</th>
</tr>
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<tbody>
<tr>
<td>PT 626</td>
<td>Clinical Agents</td>
<td>3</td>
</tr>
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</table>

### JUSTIFICATION:

This course is being changed as part of the curriculum changes with the new DPT program required for continued accreditation for the physical therapy program. The course has been upgraded to reflect the expectations in a doctoral program.

### NEW COURSE DESCRIPTION:

(Not to exceed 80 words, and language should conform to catalog copy. See http://www.csus.edu/umanual/acad.htm - Guidelines for Catalog Course Description)

This course presents theory, demonstration and laboratory practice in physical therapy modalities and techniques including thermal agents, hydrotherapy, ultrasound (US), ultraviolet, diathermy and massage. Theory, demonstration and practice using electrical modalities are included. Case Studies will be utilized for decision making in the proper application of modalities based on current research evidence, knowledge of indications, contraindications and physiologic effects. **Open to Physical Therapy majors only.**

### Note:

#### Prerequisite:

<table>
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<tr>
<th>Name</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>BIO 633</td>
<td>Human Gross Anatomy for Physical Therapists</td>
</tr>
<tr>
<td>PT 600</td>
<td>Pathokinesiology</td>
</tr>
<tr>
<td>PT 608</td>
<td>PT/Patient/Professional Interactions</td>
</tr>
<tr>
<td>PT 630</td>
<td>Pathophysiology</td>
</tr>
<tr>
<td>PT 602</td>
<td>Evidence Informed Practice I</td>
</tr>
<tr>
<td>PT 604</td>
<td>Principles of Human Movement</td>
</tr>
<tr>
<td>PT 606</td>
<td>Therapeutic Measurements and Techniques</td>
</tr>
<tr>
<td>PT 614</td>
<td>Neuroscience for Physical Therapists</td>
</tr>
<tr>
<td>PT 618</td>
<td>Foundations for Patient Management</td>
</tr>
<tr>
<td>PT 620</td>
<td>Physical Therapy Interventions I</td>
</tr>
<tr>
<td>PT 622</td>
<td>Evidence Informed Practice II</td>
</tr>
<tr>
<td>PT 632</td>
<td>Pharmacology for Physical Therapists</td>
</tr>
<tr>
<td>PT 634</td>
<td>Diagnostic Imaging for Physical Therapists</td>
</tr>
<tr>
<td>PT 636</td>
<td>Geriatrics/Gerontology for Physical Therapists</td>
</tr>
<tr>
<td>PT 638</td>
<td>Health, Wellness and Ergonomics in Physical Therapy</td>
</tr>
</tbody>
</table>

### Enforced at Registration: Yes x___ No ___

#### Corequisite:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
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<tbody>
<tr>
<td>PT 624</td>
<td>Adult Neuromuscular Patient Management I</td>
</tr>
<tr>
<td>PT 625</td>
<td>Musculoskeletal Patient Management I</td>
</tr>
<tr>
<td><strong>PT 640</strong></td>
<td>Physical Therapy Interventions II</td>
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<tr>
<td>-------------</td>
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<tr>
<td><strong>PT 646</strong></td>
<td>Acute Care and Cardiopulmonary Physical Therapy</td>
</tr>
</tbody>
</table>

**CO-REQUISITES**

<table>
<thead>
<tr>
<th>Enforced at Registration: Yes  No</th>
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<tbody>
<tr>
<td>Graded: Letter <em>x</em>  Credit/No Credit</td>
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<tr>
<td>Instructor Approval Required?   Yes   No <em>x</em></td>
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| Course Classification (e.g., lecture, lab, seminar, discussion): Lecture/Lab _C-02; C 16_   |
| Title for CMS (not more than 30 characters): Clinical Agents   |

<table>
<thead>
<tr>
<th>Cross Listed?</th>
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<tbody>
<tr>
<td>Yes   No <em>x</em></td>
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</table>

If yes, do they meet together and fulfill the same requirement, and what is the other course?

**How Many Times Can This Course be Taken for Credit?**   once

Can the course be taken for Credit more than once during the same term? Yes   No _x_
FOR NEW COURSE PROPOSALS OR SUBSTANTIVE CHANGES ONLY:

Description of the Expected Learning Outcomes: Describe outcomes using the following format: “Students will be able to: 1), 2), etc.” See the example at http://www.csus.edu/acaf/example.htm

At the completion of this course the student will be able to:

**Goal 1.0 Demonstrate Professional Competence in the use of Therapeutic Modalities**

1.1 Compare and contrast normal biological, physiological, and psychological mechanisms of the human body with pathophysiological factors that lead to impairments.

1.1.1 Compare and contrast normal biological, physiological, and psychological mechanisms of the human body with pathophysiological factors that lead to impairments and apply to the use of modalities.

1.1.2 Discuss the etiology and clinical features of major disorders.

1.1.3 Discuss the etiology and clinical features of major disorders that will be treated with modalities.

1.1.4 Analyze the effects of pharmacological agents on human function when applying iontophoresis and phonophoresis

1.2. Determine the physical therapy needs of any individual seeking services.

1.2.1 Determine the physical therapy modality needs of any individual seeking services.

1.2.2 Perform an effective and efficient physical therapy screen.

1.2.2.1 Perform an effective and efficient physical therapy screen prior to the application of modalities.

1.2.3 Evaluate and interpret the results of examinations to arrive at a physical therapy diagnosis.

1.2.3.1 Evaluate and interpret the results of examinations to arrive at a physical therapy diagnosis prior to the application of modalities.

1.3. Develop a plan of care that considers the person’s individual needs and goals, the pathophysiology involved, the biological mechanisms of human function, the environment where care is being rendered, accurate interpretation of the results of examinations, careful analysis of all gathered data, and resource constraints.

1.3.1 Develop a plan of care when using modalities that considers the person’s individual needs and goals, the pathophysiology involved, the biological mechanisms of human function, the environment where care is being rendered, accurate interpretation of the results of examinations, careful analysis of all gathered data, and resource constraints.

1.3.2 Evaluative findings, including but not limited to the evaluation of pain, skin status the results of somatosensory testing, and the presence of swelling.

1.3.3 Prioritize patient/client problems taking into consideration the patient/client’s needs and goals, pathophysiology, and biological mechanisms within the constraints of the environment and resources.

1.3.3.1 Examine the scientific basis and the effectiveness of the physical therapy evaluation and treatment procedures utilizing therapeutic agents/modalities.

1.3.3.2 Explain the scientific basis of ECG’s and electrophysiological testing of muscles and nerves, recognize normal and abnormal findings, and identify the physical therapy ramifications of both normal and abnormal findings.

1.3.4 Select appropriate physical therapy interventions that consider the patient/client’s needs and goals.

1.3.4.1 Select appropriate physical therapy modality that considers the patient/client’s needs and goals.

1.3.4.2 Determine the appropriateness of the use of each of the physical agents/modalities listed in objective #h (below), based on the following: and justify the choice of procedures.

1.3.4.3 Propose the appropriate sequence of treatment procedures, including the use of therapeutic agents/modalities, either singly or in combination, given a specific clinical situation.

1.3.4.4 Determine the most appropriate personnel for carrying out the treatment

1.3.5 Determine the amount of time required to achieve optimal function with the implementation of the care plan.

1.3.5.1 The patient's potential for achieving the desired goals.

1.3.5.2 Determine the frequency, duration and intensity of the procedures.

1.3.5.3 Determine the amount of time required to achieve optimal function with the implementation of modalities.

1.4. Implement the physical therapy plan of care designed to restore and/or maintain optimal function, applying selected therapeutic interventions that demonstrate safe, effective, and efficient psychomotor skills in the performance of physical therapy procedures and techniques.

1.4.1 Implement the physical therapy plan of care designed to restore and/or maintain optimal function, applying selected therapeutic modalities that demonstrate safe, effective, and efficient psychomotor skills in the performance of physical therapy procedures and techniques.

1.4.2 Formulate the factors used to make decisions regarding acquisition, inspection and maintenance of equipment used in the administration of therapeutic agents/modalities

1.4.3 Evaluate unsafe conditions and instruct and apply standard safety procedures to specific patient care situations when using therapeutic agents/modalities.

1.4.4 Demonstrate the principles of operation, and effectively administer or describe application procedures for the following therapeutic agents/modalities in a manner that assures safety and is appropriate to the patient's status and desired goals:

1.4.4.1 Biofeedback

1.4.4.2 Cryotherapy

1.4.4.3 Electro-physiological agents

1.4.4.4 Electro-physiological testing of muscles and nerves

1.4.4.5 Electromagnetic radiation

1.4.4.6 Functional neuromuscular electrical stimulation

1.4.4.7 Hydrotherapy

1.4.4.8 Iontophoresis
1.4.4.9 Laser
1.4.4.10 Massage
1.4.4.11 Mechanical compression
1.4.4.12 Mechanical traction
1.4.4.13 Superficial heat
1.4.4.14 Ultrasound
1.4.4.15 Ultrasound/electrical stimulation combination
1.4.4.16 Ultraviolet
1.4.4.17 Examine the contraindications to each of the therapeutic agents/modalities listed above.
1.4.4.18 Specify the appropriate level of patient supervision
1.4.4.19 Apply the most efficient and effective therapeutic modality utilizing appropriate physical therapy procedures and techniques to produce changes in the patient/client’s condition consistent with the diagnosis and prognosis.

1.4.5 Modify or redirect selected therapeutic interventions in light of reexaminations and/or patient/client’s response to interventions.
1.4.5.1 Design the ways in which to assess the effectiveness of each procedure listed in objective 1.4.1. and modify the treatment as needed.

1.4.6 Assess patient/client progress towards goals/projected outcomes.
1.4.6.1 Assess patient/client progress towards goals/projected outcomes with the use of modalities.

1.5. Demonstrate effective verbal and written communication skills with patients, families, other health care professionals, and the public, to facilitate therapeutic interventions and interdisciplinary interactions and cooperation.
1.5.1 Demonstrate effective verbal and written communication skills (concerning modalities) with patients, families, other health care professionals, and the public, to facilitate therapeutic interventions and interdisciplinary interactions and cooperation.
1.5.2 Demonstrate thorough, yet concise documentation that meets the requirements of professional documentation.
1.5.2.1 Document the use of therapeutic agents/modalities in an appropriate manner.

1.6 Determine the appropriate discharge and follow-up plan for patients/clients.
1.6.1 Determine when appropriate to discontinue modalities and follow-up plan.

1.7 Provide rationales for all decisions made in patient/client care.
1.7.1 Provide rationales for decisions made in selecting modalities.

1.9 Engage in education activities consistent with imparting information and knowledge unique to the expertise of physical therapists to individuals or groups.
1.9.1 Engage in education activities consistent with imparting information and knowledge concerning modalities.

Goal 2.0: Demonstrate Professional Behaviors
2.1 Recognize cultural, ethnic, age, economic, and psychosocial differences and apply a humanistic and holistic approach to the delivery of a clinical service.
2.1.1 Recognize cultural, ethnic, age, economic, and psychosocial differences and apply a humanistic and holistic approach to the delivery of modalities.
2.2 Communicate effectively for varied audiences and purposes.
2.2.1 Communicate effectively for varied audiences and purposes when applying modalities.

Goal 3.0: Practice in an Ethical and Legal Manner
3.1 Practice application of modalities in a safe, legal, ethical and professional manner.
3.2 Abide by the APTA Code of Ethics.

Goal 4.0: Demonstrate Scholarship
4.1 Adhere to all applicable state and federal laws.
4.1.3 Evaluate the efficacy and effectiveness of physical therapy therapeutic interventions.
4.1.3.1 Evaluate the efficacy and effectiveness of modalities.
4.1.4 Read, critique, and interpret professional literature.
4.1.4.1 Read, critique, and interpret professional literature on modalities.
4.2 Contribute to the body of knowledge of physical therapy.
4.2.1 Participate in, plan and/or conduct clinical, basic, or applied research.
4.2.1.1 Participate in, plan and/or conduct clinical, basic, or applied research with modalities.
4.2.1.2 Disseminate the results of modality research.

**Attach a list of the required/recommended course readings and activities [Note: it is understood that these are updated and modified as needed by the instructor(s).] This attachment should be forwarded only to your Dean's office, not Academic Affairs.

Assessment Strategies: A description of the assessment strategies (e.g., portfolios, examinations, performances, pre- and post-tests, conferences with students, student papers) which will be used by the instructor to determine the extent to which students have achieved the learning outcomes noted above:

GRADING PROCEDURES:
Nine (9) Quiz’s, each worth 3% of total grade (except Quiz #8 = 6%) ..................... 30%
Written midterm (25%) and practical exam (10%) - covers weeks 1-7 ...................... 35%
Written final (25%) and practical exam (10%) - covers weeks 9-15 ......................... 35%
A .................................................. ≥ 93.0%
A- .................................................. ≥ 90.0
B+ .................................................. ≥ 87.0%
B .................................................. ≥ 83.0%
B- .................................................. ≥ 80.0%
C+ .................................................. ≥ 77.0%
C .................................................. ≥ 70.0%
D .................................................. 60.0%
F .................................................. < 60.0%

PRACTICAL EXAMINATION
Practical examinations will test the student's ability to design and explain treatment choices. Students will execute evaluation and treatment techniques in a safe and effective manner. Failure to execute a specific technique safely will result in a 50 point deduction and a failing grade on that practical exam. Students must achieve a minimum average of 80% on each practical examination. If a student fails to achieve this minimum grade, he/she will be required to take another practical examination in the skill category in which the failure occurred. If the student achieves a passing grade in the practical examination taken for a second time, their final score for the practical will be the score they received on the first practical exam. If the student does not receive a passing grade in the practical examination taken for a second time, the student will receive a 0% grade for that examination, and he/she will receive an average of the two examination grades as their final score for the practical. The student will then be required to perform remediation appropriate to the deficiency as determined by the course instructor, which will include being able to pass all additional practical examinations given. The remediation must successfully be completed by the end of regularly scheduled classes of the semester in which the remediation is assigned. If the remediation is not successfully completed, the student will receive, at most, a D grade in the course regardless of the scores on other examinations.

For whom is this course being developed?
Majors in the Dept  x  Majors of other Depts  ____  Minors in the Dept  ____  General Education  ____  Other  ____
Is this course required in a degree program (major, minor, graduate degree, certificate)? Yes  x  No  ____
If yes, identify program(s): DPT

Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer facilities, faculty, etc.)? Yes  ____  No  x
If yes, attach a description of resources needed and verify that resources are available.

Indicate which department or programs will be affected by the proposed course (if any).  ______________  Physical Therapy

The Department Chair's signature below indicates that affected programs have been sent a copy of this proposal form.

Approvals: If proposed change, new course or deletion is approved, sign and date below. If not approved, forward without signing to the next reviewing authority, and attach an explanatory memorandum to the original copy.

Signatures:                                      Date
Department Chair:  _______________________________   2-16-11
College Dean or Associate Dean:  ___________________   2-16-11
CPSP (for school personnel courses ONLY)
Associate Vice President
and Dean for Academic Programs

Distribution: Academic Affairs (original), Department Chair and College Dean. Dean’s office to send original after approval to Academic Affairs, at mail zip 6016. An electronic copy must also be sent.
PT626 Clinical Agents

COURSE CREDIT: 3 units

INSTRUCTOR: TBA
OFFICE: 
OFFICE HOURS: 
TELEPHONE: 
E-MAIL: 

CLASSROOM: TBA

TIME: TBA

COURSE DESCRIPTION
This course presents theory, demonstration and laboratory practice in physical therapy modalities and techniques including thermal agents, hydrotherapy, ultrasound (US), ultraviolet, diathermy and massage. Theory, demonstration and practice using electrical modalities is included. Case Studies will be utilized for decision making in the proper application of modalities based on current research evidence, knowledge of indications, contraindications and physiologic effects. Open to Physical Therapy majors only.

PREREQUISITES:
BIO 633 Human Gross Anatomy for Physical Therapists
PT 600 Pathokinesiology
PT 608 PT/Patient/Professional Interactions
PT 630 Pathophysiology
PT 602 Evidence Informed Practice I
PT 604 Principles of Human Movement
PT 606 Therapeutic Measurements and Techniques
PT 614 Neuroscience for Physical Therapists
PT 618 Foundations for Patient Management
PT 620 Physical Therapy Interventions I
PT 622 Evidence Informed Practice II
PT 632 Pharmacology for Physical Therapists
PT 634 Diagnostic Imaging for Physical Therapists
PT 636 Geriatrics/Gerontology for Physical Therapists
PT 638 Health, Wellness and Ergonomics in Physical Therapy

CO-REQUISITES:
PT 624 Adult Neuromuscular Patient Management I
PT 625  Musculoskeletal Patient Management I
PT 640  Physical Therapy Interventions II
PT 646  Acute Care and Cardiopulmonary Physical Therapy

REQUIRED TEXTS/ REFERENCES:

COURSE OBJECTIVES: (Referenced to Program Educational Outcomes and Related Objectives)
At the conclusion of this course, the student is expected to:
**Goal 1.0 Demonstrate Professional Competence in the use of Therapeutic Modalities**
1.1 Compare and contrast normal biological, physiological, and psychological mechanisms of the human body with pathophysiological factors that lead to impairments.
   1.1.1 Compare and contrast normal biological, physiological, and psychological mechanisms of the human body with pathophysiological factors that lead to impairments and apply to the use of modalities.
   1.1.2 Discuss the etiology and clinical features of major disorders.
   1.1.3 Discuss the etiology and clinical features of major disorders that will be treated with modalities.
   1.1.4. Analyze the effects of pharmacological agents on human function when applying iontophoresis and phonophoresis
1.2. Determine the physical therapy needs of any individual seeking services.
   1.2.1 Determine the physical therapy modality needs of any individual seeking services.
   1.2.2 Perform an effective and efficient physical therapy screen.
      1.2.2.1 Perform an effective and efficient physical therapy screen prior to the application of modalities.
   1.2.3 Evaluate and interpret the results of examinations to arrive at a physical therapy diagnosis.
      1.2.3.1 Evaluate and interpret the results of examinations to arrive at a physical therapy diagnosis prior to the application of modalities.
1.3. Develop a plan of care that considers the person’s individual needs and goals, the pathophysiology involved, the biological mechanisms of human function, the environment where care is being rendered, accurate interpretation of the results of examinations, careful analysis of all gathered data, and resource constraints.
   1.3.1 Develop a plan of care when using modalities that considers the person’s individual needs and goals, the pathophysiology involved, the biological mechanisms of human function, the environment where care is being rendered, accurate interpretation of the results of examinations, careful analysis of all gathered data, and resource constraints.
   1.3.2 Evaluative findings, including but not limited to the evaluation of pain, skin status the results of somatosensory testing, and the presence of swelling.
   1.3.3 Prioritize patient/client problems taking into consideration the patient/client’s needs and goals, pathophysiology, and biological mechanisms within the constraints of the environment and resources.
   1.3.3.1 Examine the scientific basis and the effectiveness of the physical therapy evaluation and treatment procedures utilizing therapeutic agents/modalities.
1.3.1.2 Explain the scientific basis of ECG's and electrophysiological testing of muscles and nerves, recognize normal and abnormal findings, and identify the physical therapy ramifications of both normal and abnormal findings.

1.3.4 Select appropriate physical therapy interventions that consider the patient/client’s needs and goals.
1.3.4.1 Select appropriate physical therapy modality that considers the patient/client’s needs and goals.
1.3.4.2 Determine the appropriateness of the use of each of the physical agents/modalities listed in objective #h (below), based on the following: and justify the choice of procedures.
1.3.4.3 Propose the appropriate sequence of treatment procedures, including the use of therapeutic agents/modalities, either singly or in combination, given a specific clinical situation.
1.3.4.4 Determine the most appropriate personnel for carrying out the treatment

1.3.5 Determine the amount of time required to achieve optimal function with the implementation of the care plan.
1.3.5.1 The patient's potential for achieving the desired goals.
1.3.5.2 Determine the frequency, duration and intensity of the procedures.
1.3.5.3 Determine the amount of time required to achieve optimal function with the implementation of modalities.

1.4. Implement the physical therapy plan of care designed to restore and/or maintain optimal function, applying selected therapeutic interventions that demonstrate safe, effective, and efficient psychomotor skills in the performance of physical therapy procedures and techniques.
1.4.1 Implement the physical therapy plan of care designed to restore and/or maintain optimal function, applying selected therapeutic modalities that demonstrate safe, effective, and efficient psychomotor skills in the performance of physical therapy procedures and techniques.
1.4.2 Formulate the factors used to make decisions regarding acquisition, inspection and maintenance of equipment used in the administration of therapeutic agents/modalities
1.4.3 Evaluate unsafe conditions and instruct and apply standard safety procedures to specific patient care situations when using therapeutic agents/modalities.
1.4.4 Demonstrate the principles of operation, and effectively administer or describe application procedures for the following therapeutic agents/modalities in a manner that assures safety and is appropriate to the patient's status and desired goals:
1.4.4.1 Biofeedback
1.4.4.2 Cryotherapy
1.4.4.3 Electro-physiological agents
1.4.4.4 Electro-physiological testing of muscles and nerves
1.4.4.5 Electromagnetic radiation
1.4.4.6 Functional neuromuscular electrical stimulation
1.4.4.7 Hydrotherapy
1.4.4.8 Iontophoresis
1.4.4.9 Laser
1.4.4.10 Massage
1.4.4.11 Mechanical compression
1.4.4.12 Mechanical traction
1.4.4.13 Superficial heat
1.4.4.14 Ultrasound
1.4.4.15 Ultrasound/electrical stimulation combination
1.4.4.16 Ultraviolet
1.4.4.17 Examine the contraindications to each of the therapeutic agents/modalities listed above.
1.4.4.18 Specify the appropriate level of patient supervision
1.4.4.19 Apply the most efficient and effective therapeutic modality utilizing appropriate physical therapy procedures and techniques to produce changes in the patient/client's condition consistent with the diagnosis and prognosis.

1.4.5 Modify or redirect selected therapeutic interventions in light of reexaminations and/or patient/client's response to interventions.
1.4.5.1 Design the ways in which to assess the effectiveness of each procedure listed in objective 1.4.1. and modify the treatment as needed.

1.4.6 Assess patient/client progress towards goals/projected outcomes.
1.4.6.1 Assess patient/client progress towards goals/projected outcomes with the use of modalities.

1.5 Demonstrate effective verbal and written communication skills with patients, families, other health care professionals, and the public, to facilitate therapeutic interventions and interdisciplinary interactions and cooperation.
1.5.1 Demonstrate effective verbal and written communication skills (concerning modalities) with patients, families, other health care professionals, and the public, to facilitate therapeutic interventions and interdisciplinary interactions and cooperation.
1.5.2 Demonstrate thorough, yet concise documentation that meets the requirements of professional documentation.
1.5.2.1 Document the use of therapeutic agents/modalities in an appropriate manner.

1.6 Determine the appropriate discharge and follow-up plan for patients/clients.
1.6.1 Determine when appropriate to discontinue modalities and follow-up plan.

1.7 Provide rationales for all decisions made in patient/client care.
1.7.1 Provide rationales for decisions made in selecting modalities.

1.9 Engage in education activities consistent with imparting information and knowledge unique to the expertise of physical therapists to individuals or groups.
1.9.1 Engage in education activities consistent with imparting information and knowledge concerning modalities.

**Goal 2.0: Demonstrate Professional Behaviors**

2.1 Recognize cultural, ethnic, age, economic, and psychosocial differences and apply a humanistic and holistic approach to the delivery of a clinical service.
2.1.1 Recognize cultural, ethnic, age, economic, and psychosocial differences and apply a humanistic and holistic approach to the delivery of modalities.

2.2 Communicate effectively for varied audiences and purposes.
2.2.1 Communicate effectively for varied audiences and purposes when applying modalities.

**Goal 3.0: Practice in an Ethical and Legal Manner**

3.1 Practice application of modalities in a safe, legal, ethical and professional manner.
3.2 Abide by the APTA Code of Ethics.

**Goal 4.0: Demonstrate Scholarship**

4.1 Adhere to all applicable state and federal laws.
4.1.3 Evaluate the efficacy and effectiveness of physical therapy therapeutic interventions.
4.1.3.1 Evaluate the efficacy and effectiveness of modalities.
4.1.4 Read, critique, and interpret professional literature.
4.1.4.1 Read, critique, and interpret professional literature on modalities.
4.2 Contribute to the body of knowledge of physical therapy.
4.2.1 Participate in, plan and/or conduct clinical, basic, or applied research.
4.2.1.1 Participate in, plan and/or conduct clinical, basic, or applied research with modalities.
4.2.1.2 Disseminate the results of modality research.

TEACHING STRATEGIES AND LEARNING ACTIVITIES

1. Combination of lecture and laboratory demonstrations
2. Practice therapeutic techniques
3. Assigned readings
4. Video presentations
5. Problem solving group discussions
6. Case studies and soap notes

ATTENDANCE

Daily attendance and timeliness is expected. Courtesy and professional responsibility requires notification of the instructor for any absence in advance. Failure to notify the professor of an absence can result in lowering your participation grade and is considered unprofessional. Students are responsible for any missed work and may be required to complete make-up assignments.

LAB ATTIRE:
Shorts and bathing suit top or sport bra for females. Shorts for males. These clothes should be available for every lab class.

ACADEMIC HONESTY

The university policy regarding academic honesty is in effect in this course and any alleged violations will be handled in accordance with the policies described in the University Catalogue. (www.csus.edu/admbus/umanual/UMA00150.htm)

BEHAVIORAL EXPECTATIONS

Students are responsible for appropriate behaviors as defined by the generic abilities. Failure to comply with behavioral expectations during class may result in a student first being warned that behavior is inappropriate, then, if inappropriate behavior continues, a student may be asked to leave a class. Repeated failure to comply with behavioral expectations can lead to failure in the course. Cell phones and beepers should be off or silent (set to vibration mode) during the class. No text messaging is permitted in class.

SPECIAL ACCOMMODATIONS

During the course of the year, some students may utilize prearranged accommodations. If you are a student with a learning disability, physical disability, or other special needs, please let me know as soon as possible if you need special accommodation. These kinds of confidential discussions are best handled during my office hours or by special appointment. You can expect confidentiality and cooperation regarding any circumstances and needs that have been verified
though the Office of Services to Students with Disabilities (SSWD) Lassen Hall 1008, (916) 278-6955.

ASSESSMENT/ ASSIGNMENTS

GRADING PROCEDURES:
Nine (9) Quiz’s, each worth 3% of total grade (except Quiz #8 = 6%) ......................... 30%
Written midterm (25%) and practical exam (10%) - covers weeks 1-7 ......................... 35%
Written final (25%) and practical exam (10%) - covers weeks 9-15 .......................... 35%

A ............................................................................................................................... ≥ 93.0%
A- ............................................................................................................................. ≥ 90.0
B+ .............................................................................................................................. ≥ 87.0%
B ............................................................................................................................... ≥ 83.0%
B- .............................................................................................................................. ≥ 80.0%
C+ .............................................................................................................................. ≥ 77.0%
C ............................................................................................................................... ≥ 70.0%
D ............................................................................................................................... 60.0%
F ............................................................................................................................... < 60.0%

PRACTICAL EXAMINATION
Practical examinations will test the student's ability to design and explain treatment choices. Students will execute evaluation and treatment techniques in a safe and effective manner. Failure to execute a specific technique safely will result in a 50 point deduction and a failing grade on that practical exam. Students must achieve a minimum average of 80% on each practical examination. If a student fails to achieve this minimum grade, he/she will be required to take another practical examination in the skill category in which the failure occurred. If the student achieves a passing grade in the practical examination taken for a second time, their final score for the practical will be the score they received on the first practical exam. If the student does not receive a passing grade in the practical examination taken for a second time, the student will receive a 0% grade for that examination, and he/she will receive an average of the two examination grades as their final score for the practical. The student will then be required to perform remediation appropriate to the deficiency as determined by the course instructor, which will include being able to pass all additional practical examinations given. The remediation must successfully be completed by the end of regularly scheduled classes of the semester in which the remediation is assigned. If the remediation is not successfully completed, the student will receive, at most, a D grade in the course regardless of the scores on other examinations.

Please note that this syllabus may be changed at any time at the discretion of the Instructor with prior notification of students.

TOPICS OUTLINE:
I. Thermal Agents
A. Biophysical effects of temperature elevation, principles of superficial heating, and clinical applications including pain and spasm reduction and range of motion improvement.

B. Contraindications and precautions and application techniques for the following therapeutic agents:
   1. Radiant heat (Infrared lamps)
   2. Conductive heat (Hot packs, Paraffin)

C. Clinical decision-making with superficial heat agents (hot vs. cold, wet vs. dry, superficial vs. deep)

II. Hydrotherapy
A. Water as a therapeutic agent (physical principles of use, biophysical effects, and indications for hydrotherapy {including wound care and exercise})
B. General description, unit operation, clinical techniques for the following therapeutic agents:
   1. Whirlpool
   2. Hubbard Tank
   3. Pool Therapy (including hot tubs and jacuzzis for exercise)

III. Cryotherapy
A. Cold as a therapeutic agent (principles of conduction and evaporation, biophysical effects, and clinical indications {including musculoskeletal trauma, myofascial pain, and spasticity})
B. General guidelines for cryotherapeutic methods and cryotherapy precautions for the following therapeutic agents:
   1. Ice (Packs, towels, massage)
   2. Cold Baths (Immersion and cold-compression units)
   3. Vapocoolant Sprays
   4. Contrast baths

IV. Therapeutic Ultrasound
A. Principles of electromagnetic energy: Power sources, transformers, power distribution (including oscillation)
B. Physical principles and biophysical effects.
C. Guidelines for clinical administration and clinical application including:
   1. Contractures and scarring
   2. Calcium deposits
   3. Tendinitis and bursitis
   4. Pain and spasm reduction
   5. Phonophoresis
   6. Tissue healing
   7. Ultrasound/electrical stimulation

V. Therapeutic Use of Light
A. Laser
   1. Physical principles and biophysical effects of laser including tissue healing and pain modulation.
   2. Indications, clinical applications, precautions and contraindications for laser.
B. Ultraviolet Radiation
   1. Physical principles, physiological effects, and dosimetry (MED).
   2. Therapeutic application, adverse effects, and treatment precautions and documentation of ultraviolet.

VI. Electrotherapeutic Agents
A. Review of electrophysiologic effects and measurements.
B. Principles of electrical stimulation.
C. Theoretical bases, clinical applications, instrumentation, indications and contraindications, and clinical decision-making for the following electrotherapeutic agents:
   1. Electrical Stimulation
      a. Of healthy muscle and for tissue repair and wound healing
      b. Of denervated muscle
      c. Clinical uses of neuromuscular electrical stimulation (range of motion, strengthening, endurance, contractures, facilitation and re-education, management of spasticity)
   2. Interferential Stimulation
   3. Direct Current
   4. High Voltage Pulsed Galvanic Stimulation
   5. Transcutaneous Electrical Nerve Stimulation
   6. Electromyographic Biofeedback
   7. Iontophoresis
   8. Clinical Electrophysiologic Assessment (Electroneuromyography)

VII. Other Therapeutic Agents
A. Mechanical Spinal Traction
B. Shortwave Diathermy
C. Intermittent Compression
PT626 Clinical Agents
Quiz #1

The following case study will be used to answer questions #1-5.

JT is a 34 year-old baseball player who felt a pain in his shoulder 2 weeks ago while performing a military press with light weights. During physical examination the PT found redness, warmth, tenderness to palpation, decreased range of motion in flexion and abduction without any visible swelling/edema.

1. What phase of tissue healing is JT in?
   A. Inflammatory
   B. Maturation
   C. Proliferation
   D. Remodeling

2. Using categories of pain described by both Cameron and Gunn what type of pain is JT most likely suffering from?
   A. Acute, Type I
   B. Acute, Type II
   C. Chronic, Type II
   D. Chronic, Type III

3. Based on these findings what would be the most appropriate modality to use on JT?
   A. Compression
   B. Heat
   C. Ice
   D. Ultrasound (continuous)

4. If JT returns with full range of motion and absence of warmth shortly after initiating physical therapy what phase of healing would JT be in?
   A. Inflammatory
   B. Maturation
   C. Proliferation
   D. Remodeling

5. If JT returns to therapy 6 months later with full range of motion and no swelling how would Cameron and Gunn categorize his pain.
   A. Acute, Type I
   B. Acute, Type II
   C. Chronic, Type II
   D. Chronic, Type III
6. Rubbing a contusion to stimulate ascending A-beta afferent nerve fibers blocks impulses carried along the afferent A-delta and C-fiber neurons. Since the A-delta and C-fibers carry pain impulses, blocking transmission of these fibers diminishes pain perception. The theory, currently disputed by some, that explains this model of pain control is known as the:
   A. Beta-Endorphin & Dynorphin Pain Blocking Mechanism
   B. Descending Pain Blocking Mechanism – Endogenous Opioid Model
   C. Descending Pain Control Mechanism – Central Biasing
   D. Gate Control System

7. Impulses from the thalamus and brain stem in response to emotional stimuli are carried to the dorsal horn on efferent fibers in the dorsal and dorsal lateral tracts. These impulses block transmission of A-delta and C-fiber neurons diminishing pain perception. The theory that explains this model of pain control is known as the:
   A. Beta-Endorphin & Dynorphin Pain Blocking Mechanism
   B. Descending Pain Blocking Mechanism – Endogenous Opioid Model
   C. Descending Pain Control Mechanism – Central Biasing
   D. Gate Control System

8. Pain perceived to be in an area removed from the existing pathology is said to be:
   A. Chronic Pain
   B. Subacute Pain
   C. Referred Pain
   D. Recurrent Pain

9. What is the estimated effective depth of penetration of the deepest penetrating physical agent?
   A. 1mm
   B. 5mm
   C. 1cm
   D. 5 cm
   E. 10 cm

10. What is the estimated effective depth of penetration of a hot pack?
    A. 1mm
    B. 5mm
    C. 1cm
    D. 5 cm
    E. 10 cm

11. According to the Cosine law, electromagnetic radiation placed at this angle to the body would provide the most absorption by the target tissue
    A. 10°
    B. 35°
    C. 45°
    D. 75°

12. When applying infrared heating lamps and diathermy it is crucial to have knowledge of the inverse squares law. The inverse squares law suggests
    A. Energy that is twice as far away will provide a ¼ times as much energy
    B. Energy that is twice as far away will provide half as much energy
    C. Energy that is twice as far away will provide four times as much energy
    D. Energy that is twice as far away will provide twice as much energy
13. What physical agent would be contraindicated?
   A. Ultrasound of a hand of a pregnant patient
   B. Electrical stimulation of the lumbar paraspinals of a pregnant patient
   C. Diathermy to the lumbar paraspinals of a pregnant patient
   D. Hot pack to the abdomen of a pregnant patient

14. After an acute inversion ankle sprain, a PT would expect the peak swelling to occur
   A. 1 hour after injury
   B. 4-6 hours after injury
   C. 12 hours after injury
   D. 24 hours after injury

15. The maturation phase of healing typically lasts
   A. Days
   B. Hours
   C. Weeks
   D. Years

16. This endogenous compound is most likely responsible for inhibiting transmission of pain through both C-fibers and A-delta fibers.
   A. Enkephalin
   B. Bradykinin
   C. Prostaglandin
   D. Serotonin

17. The theory that best describes how acupuncture works is the
   A. Beta Endorphin & Dinorphin Theory
   B. Central Biasing Model
   C. Endogenous Opioid Model
   D. Gate Control Theory

18. Pain is most easily localized in this tissue
   A. Muscle
   B. Nerve
   C. Skin
   D. Visceral structures

19. Endogenous Opioids are helpful in shutting the “gate” on pain signals. The release of endogenous Opioids is most helpful at the
   A. A-Beta Cells
   B. A-delta cells
   C. C-fiber cells
   D. T cells

20. The most current terminology for painful extremities as a result of supersensitized sympathetic fibers is:
   A. Causalgia
   B. Complex Regional Pain Syndrome
   C. Reflex Sympathetic Dystrophy
   D. Shoulder-Hand Syndrome
21. Physical agents are typically using what pathways to shut the “gate” on pain.
   A. A-beta
   B. A-delta
   C. Lateral Spinothalamic
   D. Spinoreticular