COURSE INFORMATION FORM

DISCIPLINE
Physical Therapist Assistant

COURSE TITLE
Applied Neurology

CR.HR  2.0  LECT HR.  2.0  LAB HR.  ________  CLIN/INTERN HR.  ________  CLOCK HR.  ________

CATALOG DESCRIPTION

PREREQUISITES
Admission to OTHA or PTHA programs, BIOL 109 or BIOL 110 and BIOL 210

EXPECTED STUDENT OUTCOMES IN THE COURSE
Upon completion of this course, the student will be able to:

1. Demonstrate terminology commonly used in neurorehabilitation.
2. Correlate the signs and symptoms with specific lesions of nervous system, including distinguishing between upper and motor neuron dysfunction.
3. Describe neurological tests used to evaluate the nervous system.
4. Distinguish between the functions of the central nervous system and peripheral nervous system.
5. Explain the influence of the basal ganglia and cerebellum on motor function.

GENERAL EDUCATION OUTCOMES (ESO)
Specify which general education outcomes, if any, are substantially addressed by the course. Numbers in parentheses identify the Expected Student Outcomes linked to the specific General Education Outcome.

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>(ESO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Natural and Physical Sciences</td>
<td>(1,2,3,4,5,6)</td>
</tr>
<tr>
<td>D. Describe and apply current theoretical explanations of the nature, organization, and evolution of living systems</td>
<td></td>
</tr>
</tbody>
</table>
PROGRAM-LEVEL OUTCOMES

CAREER AND TECHNICAL EDUCATION PROGRAM OUTCOMES
Specify which Career and Technical program outcomes, if any, are substantially addressed by the course by completing the “Career and Technical Education template” to show the relationship between course and program outcomes to assessment measures.

3. Competently implements the physical therapy plan of care (1-6)

CLASS-LEVEL ASSESSMENT MEASURES
Student accomplishment of expected student outcomes will be assessed using the following measures. (Identify which measures are used to assess which outcomes.)

• Written examination and quizzes (1-6)
Individual instructors may order this outline as fits the needs of their individual courses. In addition, they may place more emphasis on some areas than on others. What is assured is that this particular list is covered in the course. Other topics may be added to a course as the instructor sees fit, and as time and interest allow. An *asterisk can be used to mark an item as optional.

I. Introduction to Nervous Systems
   A. Neurons
      1. Nerve cell components
      2. Transmission of nervous impulses
         a) Cell depolarization/repolarization
         b) Role of myelin and Multiple sclerosis
   B. Central nervous system
      1. Components
      2. Autonomic nervous system
   C. Peripheral nervous system and components

II. Anatomy of the Central Nervous System
   A. Lobes of the brain
      1. Frontal lobe
         a) Motor areas
         b) Broca's area
            i) Expressive aphasia
            ii) Agraphia
      2. Parietal lobe
         a) Sensory areas
         b) Testing
            i) Proprioception/kinesthesia
            ii) Stereognosis
      3. Temporal lobe
         a) Wernicke's area
         b) Clinical presentations
            i) Receptive aphasia
            ii) Alexia
      4. Occipital lobe
         a) Visual areas
         b) Visual field cuts
   B. Basal ganglia
      1. Anatomy
      2. Associated nuclei
         a) Subthalamic nuclei
         b) Substantia nigra
         c) Role of dopamine in Parkinson's disease
      3. Dysfunction of basal ganglia
         a) Hyperkinesia
i  Choreas
ii  Athetosis

b) Hypokinesia
i  Rigidity
   (a) Cogwheel
   (b) Clasped knife
   (c) Lead pipe

C. Cerebral hemispheres
1. Functions of right vs. left hemisphere
2. Characteristics of right dominant vs. left dominant people
3. Symptoms commonly seen in right CVA vs. left CVA

D. Brainstem
1. Diencephalon and thalamic syndrome
2. Pons
3. Medulla and decussation of pyramids
4. Reticular formation
   a) Reticular activation system
   b) Clinical application
      i  Levels of consciousness
      ii  Glasgow coma scale

E. Cerebellum
1. Anatomy
2. Dysfunction of the cerebellum
   a) Lateral vs. midline damage
   b) Romberg's sign

F. Circulation of the brain/CNS
1. Meninges and meningitis
2. Cerebrospinal fluid
   a) Production
   b) Absorption
   c) Assessment of lumbar puncture
3. Cerebral arteries
   a) Circle of Willis
   b) Occlusions/clinical deficits
      i  Thrombus
      ii  Embolus
      iii  Aneurysm
      iv  CVA vs. TIA
      v  Wallenberg's syndrome

G. Spinal cord
1. Gross anatomy
2. Cross section anatomy and spinal nerves

III. Spinal Reflexes
A. Motor neurons
1. Types
2. Location
B. Muscle receptors and alpha, gamma and beta
C. Muscle spindle
1. Components
2. Role in reflex activity

D. Spinal reflexes
   1. Assessment of
      a) Reflex arc
      b) Types
         i) Monosynaptic stretch reflex (DTR)
         ii) Flexor reflex different
             (a) Crossed extension
             (b) Flexor withdrawal
         iii) Inverse myotatic reflex
         iv) Golgi tendon organ

IV. Motor Tracts
   A. Pyramidal tracts
      1. Corticospinal
      2. Corticobulbar
   B. Extrapyramidal tracts
      1. Reticulospinal
      2. Vestibulospinal

V. Sensory Tracts
   A. Spinothalamic
   B. Medial lemniscus and Brown-Séquard syndrome
   C. Trigeminal lemniscus
   D. Spinocerebellar