# Course Approval Form

**Action Requested:**
- [X] Create new course
- Modify existing course (check all that apply)
- Title
- Prereq/coreq
- Other:
- Credits
- Repeat Status
- Schedule Type
- Restrictions
- Grade Type

**Course Level:**
- Undergraduate
- Graduate

**College/School:** Health and Human Services
**Department:** Rehabilitation Science
**Submitted by:** aguccion@gmu.edu
**Ext:** 3-4650
**Email:** aguccion@gmu.edu

**Subject Code:** RHBS
**Number:** 754
**Effective Term:** Fall
**Year:** 2014

**Title:**
- Current
  - Movement Disorders: Etiology, Assessment, and Analyses
  - Mvmt Disord Etiol Assess Analy
- New

**Credits:**
- (check one)
  - Fixed
    - 3 or
    - to
- Repeat Status:
  - (check one)
    - Not Repeatable (NR)
    - Repeatable within degree (RD)
    - Repeatable within term (RT)
  - Maximum credits allowed:

**Grade Mode:**
- (check one)
  - Regular (A, B, C, etc.)
  - Satisfactory/No Credit
  - Special (A, B C, etc. +IP)

**Schedule Type Code(s):**
- (check all that apply)
  - Lecture (LEC)
  - Lab (LAB)
  - Recitation (RCT)
  - Seminar (SEM)
  - Internship (INT)
  - Studio (STU)
  - Internship (INT)
  - Studio (STU)

**Prerequisite(s):**
- RHBS 746 or permission of instructor

**Corequisite(s):**

**Instructional Mode:**
- 100% face-to-face
- Hybrid: ≤ 50% electronically delivered
- 100% electronically delivered

**Special Instructions:**
(list restrictions for major, college, or degree; hard-coding; etc.)

**Are there equivalent course(s)?**
- Yes
- No

**Catalog Copy for NEW Courses Only**
(Consult University Catalog for models)

<table>
<thead>
<tr>
<th>Description (No more than 60 words, use verb phrases and present tense)</th>
<th>Notes (List additional information for the course)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applies concepts of neuromechanics to the assessment and analysis of normal and pathological movement using both existing clinical assessments and laboratory-based measures of body kinematics, kinetics, muscle activity, and perception/cognition interactions with movement. Discusses benefits and limitations of assessment and analysis techniques as well as current research with regard to advancing these techniques.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicate number of contact hours:</th>
<th>Hours of Lecture or Seminar per week:</th>
<th>Hours of Lab or Studio:</th>
</tr>
</thead>
<tbody>
<tr>
<td>When Offered: (check all that apply)</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Fall</td>
<td>Summer</td>
<td>Spring</td>
</tr>
</tbody>
</table>

**Approval Signatures**

Department Approval
- Date

College/School Approval
- Date

If this course includes subject matter currently dealt with by any other units, the originating department must circulate this proposal for review by those units and obtain the necessary signatures prior to submission. Failure to do so will delay action on this proposal.

**For Graduate Courses Only**

<table>
<thead>
<tr>
<th>Unit Name</th>
<th>Unit Approval Name</th>
<th>Unit Approver’s Signature</th>
<th>Date</th>
</tr>
</thead>
</table>

**For Registrar Office’s Use Only:** Banner ___________________________ Catalog ___________________________ revised 2/2/10
RHBS 75X (3:0:0): Movement Disorders: Etiology, Assessment, and Analyses
Department of Rehabilitation Science
College of Health & Human Services
George Mason University

Course Instructor: Kevin Terry, PhD
Office Hours: By appointment, Robinson A451C
Phone: 3-1903
e-mail: kterry4@gmu.edu

Time/Location:

Course Description
Applies concepts of neuromechanics to the assessment and analysis of normal and pathological movement using both existing clinical assessments and laboratory-based measures of body kinematics, kinetics, muscle activity, and perception/cognition interactions with movement. Discusses benefits and limitations of assessment and analysis techniques as well as current research with regard to advancing these techniques.

Objectives
By the end of the course, students will be able to:

1. Identify and discuss the etiology and symptoms of common movement disorders using gait and balance as primary movement topics
2. Apply and critically evaluate existing clinical and laboratory-based methods of movement assessment and analysis
3. Understand the benefits and limitations of current movement assessment and analytical techniques
4. Interpret movement assessment and analysis results and understand their clinical significance

Readings

3. Supplemental Readings as assigned

Academic Integrity
GMU is an Honor Code university; please see the University Catalog for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously and violations are treated gravely. When you are responsible for a task, you will perform that task. When you rely on someone else’s work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. Another aspect of academic integrity is the free play of ideas. Discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind) please ask for guidance and clarification.
Electronic Devices

Cell phones, pagers, and other communicative devices are not allowed in this class. Please keep them stowed away and out of sight. **Laptops or tablets are permitted for the purpose of taking notes and group projects only.** If you engage in activities not related to the course (e.g., gaming, email, chat, etc.), you will lose this privilege.

Schedule conflicts

Please review the schedule for this class and let me know as soon as possible if there are work, family, or religious holiday conflicts as soon as possible so that arrangements can be made.

GMU Email Accounts

Students must use their Mason email accounts—either the existing “MEMO” system or a new “MASONLIVE” account to receive important University information, including messages related to this class. See [http://masonlive.gmu.edu](http://masonlive.gmu.edu) for more information.

Office of Disability Services

If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at 993-2474. All academic accommodations must be arranged through the ODS. [http://ods.gmu.edu](http://ods.gmu.edu)

University Policies

The University Catalog, [http://catalog.gmu.edu](http://catalog.gmu.edu), is the central resource for university policies affecting student, faculty, and staff conduct in university academic affairs. Other policies are available at [http://universitypolicy.gmu.edu/](http://universitypolicy.gmu.edu/). All members of the university community are responsible for knowing and following established policies.

Diversity


Assessment/Grading

As different assessments and analyses are discussed, students will conduct their assessments and analyses on their own time in the RHBS Lab. There will be a final group capstone project that more fully explores a novel assessment/analysis of movement that is based on those learned in this course. Grades will be based on the following criteria:

- Homework (Lab Assessments and Analyses): 40%
- Capstone Project: 35%
- Final Exam: 25%
This syllabus is subject to discretionary changes that will be announced in class and on Blackboard.

**Class Schedule**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Introduction to Movement Disorders &amp; Neuroimaging (MD: Chaps. 1-4)</td>
</tr>
<tr>
<td>2</td>
<td>Basal Ganglia and Movement Disorders (MD: Chaps. 5-7)</td>
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<td>3</td>
<td>Neurotrophic Factors and Neuropathology of Movement Disorders (MD: Chaps. 8 &amp; 9)</td>
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<td>4</td>
<td>Normal Gait (GA: Chaps. 1-9)</td>
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<tr>
<td>5</td>
<td>Gait Analysis (GA: Chaps. 19-24)</td>
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<td>6</td>
<td>Gait Disorders, Movement Disorders in Children and Older Adults (MD: Chaps. 49-51)</td>
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<tr>
<td>7</td>
<td>Pathological Gait Analysis (GA: Chaps. 10-14)</td>
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<tr>
<td>8</td>
<td>Parkinson's Disease: Genetics, Epidemiology, and Etiology (MD: Chaps. 10, 11, 13 &amp; 14)</td>
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<tr>
<td>9</td>
<td>Parkinson's Disease: Symptoms, Treatment, and Therapies (MD: Chaps. 15-19)</td>
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<tr>
<td>10</td>
<td>Tremor Disorders (MD: Chaps. 27-29)</td>
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<tr>
<td>11</td>
<td>Dystonic Disorders (MD: Chaps. 30-33)</td>
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<tr>
<td>12</td>
<td>Huntington's Disease (MD: Chaps. 34-36)</td>
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<tr>
<td>13</td>
<td>Ataxias (MD: Chaps. 43-45)</td>
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<tr>
<td>14</td>
<td><strong>Capstone Project Presentations</strong></td>
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<tr>
<td></td>
<td><strong>Final Exam</strong></td>
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</tbody>
</table>

**Supplemental Reading List**

**Week 2**

*Differential neural activation patterns in patients with Parkinson's disease and freezing of gait in response to concurrent cognitive and motor load.*
Shine JM, Matar E, Ward PB, Bolitho SJ, Pearson M, Naismith SL, Lewis SJ.

*Moving forward with prisms: sensory-motor adaptation improves gait initiation in Parkinson's disease.*
Bultitude JH, Rafal RD, Tinker C.

**Week 3**

de Sousa SM, Massano J.
CNS Neurol Disord Drug Targets. 2013 Jul 10. [Epub ahead of print]

*Huntington's disease and cell therapies: past, present, and future.*
Antoniades CA, Watts C.

**Week 4**

*Self-paced versus fixed speed treadmill walking.*
Sloot LH, van der Krogt MM, Harlaar J.
Week 5
Validation of a passive dynamic walker model for human gait analysis.
Handzic I, Reed KB.

Week 6
Quantitative Gait Disturbances in Older Adults with Cognitive Impairments.
Bridenbaugh SA, Kressig RW.
Curr Pharm Des. 2013 Sep 18. [Epub ahead of print]

Spatio-temporal gait analysis in children with cerebral palsy using, foot-worn inertial sensors.
Brégou Bourgeois A, Mariani B, Aminian K, Zambelli PY, Newman CJ.

Week 7
Dual task cost of walking is related to fall risk in persons with multiple sclerosis.
Wajda DA, Motl RW, Sosnoff JJ.

Interlimb coordination during forward walking is largely preserved in backward walking in children with cerebral palsy.
Meyns P, Molenaers G, Desloovere K, Duysens J.

Week 9
Parkinson's disease and segmental coordination during turning: I. Standing turns.
Akram S, Frank JS, Jog M.

Parkinson's disease and segmental coordination during turning: II. Walking turns.
Akram S, Frank JS, Jog M.

Week 10
Tremor in Multiple System Atrophy - a review.
Kaindlstorfer C, Granata R, Wenning GK.

Rechargeable Deep Brain Stimulation Implantable Pulse Generators in Movement Disorders: Patient Satisfaction and Conversion Parameters.
Waln O, Jimenez-Shahed J.

Week 11
Future of brain stimulation: New targets, new indications, new technology.
Hariz M, Blomstedt P, Zrinzo L.

Treatment effectiveness of brain-computer interface training for patients with focal hand dystonia: A double-case study.
Hashimoto Y, Ota T, Mukaino M, Ushiba J.
**Week 12**

**Mirror movements in movement disorders: a review.**  
Cox BC, Cincotta M, Espay AJ.  

**Huntington's disease.**  
Ha AD, Fung VS.  

**Week 13**

**Cerebellar and Afferent Ataxias.**  
Pandolfo M, Manto M.  

**Huntington's disease masquerading as spinocerebellar ataxia.**  
Rodríguez-Quiroga SA, Gonzalez-Morón D, Garretto N, Kauffman MA.  