

# **Movement Disorders**

## **David E. Vaillancourt, PhD**

**Time and Place:** T, Period 2-4 (8am – 11am), McKnight Brain Institute, FL-GYM 235

**Text Book:** Lecture notes only

**Instructor Contact:** email: [vcourt@ufl.edu](mailto:vcourt@ufl.edu), office: 170I FL-GYM, phone: 4-1770

**Office Hours:** TBA

### **Course Description:**

The course covers the sensory and motor systems of the nervous system responsible for regulating movement in movement disorders. We cover movement disorders including Parkinson's disease, tics, Huntington's disease, dystonia, tremor, spinal cord injury, spasticity, cerebellar disorders, and speech and language disorders. Students will be asked to attend the weekly clinical meetings at McKnight Brain Institute to see a first-hand clinical perspective of movement disorders. The course integrates motor neurons, upper motor neurons, cortical physiology of movements, basal ganglia physiology, cerebellar physiology, posture, and eye movements. We will also discuss techniques used to measure movement and brain structure and function.

In addition to lectures, students will be given primary literature to read and present. Students will be expected to lead a discussion of a research article on the movement disorder discussed each week. A class research project will be completed by each student, using available data on a movement disorder to test a hypothesis of interest to each student. Students will write a report and present the findings to the class.

### **Evaluation:**

#### Article Presentation (40%)

-students evaluated on presentation quality, slide content, and answering questions from the audience

#### Attendance (10%)

-students are expected to attend class. The attendance grade is weighted by the number of classes attended divided by the total number of classes.

#### In-class Discussion (20%)

-students will be monitored on the number of questions asked; comments provided during student presentations;

#### Class Project (30%)

-written and oral aspects contribute to the overall grade; written portion is examined on quality of the background for the investigation, analysis methods, figures and data presentation, and discussion; oral presentation assessed on presentation quality, slide content, and answering questions from the audience

### **Attendance:**

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

### **Grades:**

Grading scale will be consistent with the scale below.

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

A (4.0)	93 – 100%
A- (3.67)	90 – 92.99%
B+(3.33)	87 – 89.99%
B (3.00)	83 – 86.99%
B- (2.67)	80 – 82.99%
C+(2.33)	77 – 79.99%
C (2.00)	73 – 76.99%
C- (1.67)	70 – 72.99%
D+(1.33)	67 – 69.99%
D (1.00)	63 – 66.99%
D- (0.67)	60 – 62.99%
E (0.00)	less than 60%

### **Student Learning Objectives:**

At the end of this course the student will be able to demonstrate mastery of the following learning objectives:

- 1) Be conversant in movement disorders research.
- 2) Identify, describe and explain the prevalence, pathophysiology, motor deficits, cognitive deficits, and treatments of each disorder.
- 3) Summarize, explain and defend data found in current research studies from major journals about each disorder.
- 4) Explore and recognize effective treatments for patients with movement disorders through interaction with practicing physical therapists, neurologists, neurosurgeons, and occupational therapists.
- 5) Appraise, analyze and describe the clinical database for the Parkinson's Progressive Marker Initiative

### **Policy for Make-up exams and other work:**

Make-up exams and other work can be requested given that there is a medical, family, or other emergency that deems the need for a make-up.

### **Policy on disabilities:**

The course will provide accommodations to students with disabilities. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

**University Policy on Accommodating Students with Disabilities:** Students requesting accommodation for disabilities must first register with the Dean of Students Office Disability Resource Center (352-392-8565) (<http://www.dso.ufl.edu/drc/>). The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. You must submit this documentation prior to submitting assignments or taking the quizzes or exams. Accommodations are not retroactive, therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

**University Policy on Academic Misconduct:** Academic honesty and integrity are fundamental values of the University community. Students should be sure that they understand the UF Student Honor Code at <http://www.dso.ufl.edu/students.php>.

**Getting Help:**

For issues with technical difficulties for E-learning in Sakai, please contact the UF Help Desk at:

- [Learning-support@ufl.edu](mailto:Learning-support@ufl.edu)
- (352) 392-HELP - select option 2
- <https://lss.at.ufl.edu/help.shtml>

Other resources are available at <http://www.distance.ufl.edu/getting-help> for:

- Counseling and Wellness resources
- Disability resources
- Resources for handling student concerns and complaints
- Library Help Desk support

Should you have any complaints with your experience in this course please visit <http://www.distance.ufl.edu/student-complaints> to submit a complaint.

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu) so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

**Course Evaluations:**

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

**Article Presentations:**

-Lead a discussion of the article for the class. Using power point is preferred.

**Weekly Outline:**Week 1:

Clinical: McKnight Brain Institute (8-9am)

Lecture: Brain Anatomy 1

Lecture: Brain Anatomy 2

Week 2:

Clinical: McKnight Brain Institute (8-9am)

Lecture: Methods 2: PET, MRI and fMRI, DTI, TMS, EEG

Articles for Week 3: (Ogawa et al., 1992, Biswal et al., 1995, Spraker et al., 2007, Park and Friston, 2013, Portnow et al., 2013)

\*presentations: power point, 15-20 minutes

#### Week 3:

Presentations: (Ogawa et al., 1992, Biswal et al., 1995, Spraker et al., 2007, Park and Friston, 2013, Portnow et al., 2013)

Articles for Week 4: (Vaillancourt et al., 2009, Peran et al., 2010, Du et al., 2012)

#### Week 4:

Clinical: McKnight Brain Institute (8-9am)

Lecture: Diagnosis of Parkinson's Disease

Presentations: (Vaillancourt et al., 2009, Peran et al., 2010, Du et al., 2012)

Articles for Week 5: (Bergman et al., 1990, Kordower et al., 2013)

#### Week 5:

Clinical: McKnight Brain Institute (8-9am)

Lecture: Pathophysiology of Parkinson's Disease

Presentations: (Bergman et al., 1990, Kordower et al., 2013)

Articles for Week 6: (Krack et al., 2003, Olanow et al., 2009)

#### Week 6:

Clinical: McKnight Brain Institute (8-9am)

Lecture: Treatments for Parkinson's Disease

Presentations: (Krack et al., 2003, Olanow et al., 2009)

Articles for Week 7: (Li et al., 2012, Corcos et al., 2013)

Articles for Week 7: (Rascol et al., 2000, Palfi et al., 2014)

#### Week 7:

Presentations: (Li et al., 2012, Corcos et al., 2013)

Presentations: (Rascol et al., 2000, Palfi et al., 2014)

Article for Week 8: (Smith et al., 2000, Rosas et al., 2008)

#### Week 8:

Clinical: McKnight Brain Institute (8-9am)

Lecture: Huntington's Disease

Presentation: (Smith et al., 2000, Rosas et al., 2008)

Article for Week 9: (Favilla et al., 2012, Groppa et al., 2014)

#### Week 9:

Clinical: McKnight Brain Institute (8-9am)

Tremor (Cerebellar Tremor, Essential Tremor, Psychogenic Tremor Only)

Presentations: (Favilla et al., 2012, Groppa et al., 2014)

Article for Week 10: (Argyelan et al., 2009, Carbon et al., 2010)

#### Week 10:

Clinical: McKnight Brain Institute (8-9am)

Lecture: Dystonia

Presentations: (Argyelan et al., 2009, Carbon et al., 2010)

Article for Week 11: (Bohlhalter et al., 2006, McCairn et al., 2009, Pourfar et al., 2011)

#### Week 11: March 31

Lecture: Tics and Tourette syndrome

Presentations: (Bohlhalter et al., 2006, McCairn et al., 2009, Pourfar et al., 2011)

Article for Week 12: (Jacobi et al., 2013, Reetz et al., 2013)

#### Week 12: April 7

Clinical: McKnight Brain Institute (8-9am)

Lecture: Cerebellum and Cerebellar Ataxia

Presentations: (Jacobi et al., 2013, Reetz et al., 2013)

Article for Week 14: (Taub et al., 2002, Zimerman et al., 2013)

#### Week 13: April 14

Clinical: McKnight Brain Institute (8-9am)

Lecture: Plasticity Lecture

Presentations: (Taub et al., 2002, Zimerman et al., 2013)

#### Week 14 and 15: Class Project Presentations

#### **References for weekly papers:**

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- Bergman H, Wichmann T, DeLong MR (1990) Reversal of experimental parkinsonism by lesions of the subthalamic nucleus. *Science* 249:1436-1438.
- Biswal B, Yetkin FZ, Haughton VM, Hyde JS (1995) Functional connectivity in the motor cortex of resting human brain using echo-planar MRI. *Magn Reson Med* 34:537-541.
- Bohlhalter S, Goldfine A, Matteson S, Garraux G, Hanakawa T, Kansaku K, Wurzman R, Hallett M (2006) Neural correlates of tic generation in Tourette syndrome: an event-related functional MRI study. *Brain* 129:2029-2037.
- Carbon M, Argyelan M, Habeck C, Ghilardi MF, Fitzpatrick T, Dhawan V, Pourfar M, Bressman SB, Eidelberg D (2010) Increased sensorimotor network activity in DYT1 dystonia: a functional imaging study. *Brain* 133:690-700.
- Corcos DM, Robichaud JA, David FJ, Leurgans SE, Vaillancourt DE, Poon C, Rafferty MR, Kohrt WM, Comella CL (2013) A two-year randomized controlled trial of progressive resistance exercise for Parkinson's disease. *Mov Disord*.
- Du G, Lewis MM, Sen S, Wang J, Shaffer ML, Styner M, Yang QX, Huang X (2012) Imaging nigral pathology and clinical progression in Parkinson's disease. *Mov Disord* 27:1636-1643.
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- Groppa S, Herzog J, Falk D, Riedel C, Deuschl G, Volkmann J (2014) Physiological and anatomical decomposition of subthalamic neurostimulation effects in essential tremor. *Brain* 137:109-121.
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- (2013) Biological and clinical characteristics of individuals at risk for spinocerebellar ataxia types 1, 2, 3, and 6 in the longitudinal RISCA study: analysis of baseline data. *Lancet neurology* 12:650-658.
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