

# **Movement Disorders (APK 6145)**

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

**Time and Place:** T, Period 2 (8am – 9am), W (8:30 – 10:30) FL Gym 225

**Text Book:** Lecture notes only

**Instructor Contact:** email: [vcourt@ufl.edu](mailto:vcourt@ufl.edu);; phone: 4-1770

### **Movement Rounds Calendar:**

[https://calendar.google.com/calendar/u/0/embed?src=68shg2kcen9ck6q7o1mprt7ni0@group.calendar.google.com&ctz=America/New\\_York](https://calendar.google.com/calendar/u/0/embed?src=68shg2kcen9ck6q7o1mprt7ni0@group.calendar.google.com&ctz=America/New_York)

### **Course objectives:**

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 using Zoom with the Fixel 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.

### **Evaluation:**

Article Presentation (20%)

Attendance (30%)

In-class Discussion (20%)

Class Project (30%)

### **Attendance:**

It is expected that students will attend all classes regularly.

### **Grades:**

Grading scale will be consistent with the scale below.

<http://www.isis.ufl.edu/minusgrades.html>

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) Understand the prevalence, pathophysiology, motor deficits, cognitive deficits, and treatments of each disorder.
- 3) Understand the most up to date research studies from major journals about each disorder.
- 4) Observe and participate with practicing physical therapists, neurologists, neurosurgeons, and occupational therapists who treat and care for patients with movement disorders.
- 5) Understand 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 (<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>

\*\* Any requests for make-ups due to technical issues MUST be accompanied by the ticket number received from LSS when the problem was reported to them. The ticket number will document the time and date of

the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

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.

**Articles:**

-Select a clinical topic related to the course.

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

Weekly Outline:

Week/Date	Material
Week 1 <i>Jan 10</i>	Syllabus explanation <b>Lecture:</b> Brain Anatomy
Week 2 <i>Jan 17</i>	<b>Clinical: Zoom with Fixel Institute (Tuesday 9-10 am)</b> <b>Lecture:</b> Methods 2: PET, MRI and fMRI, DTI, TMS, EEG Assignment of papers 1-7 for Week 3.
Week 3 <i>Jan 24</i>	<b>Clinical: Zoom with Fixel Institute (Tuesday 8-9 am)</b> <b>Project explanation, students work together to identify project goal and topic</b> <b>Presentations:</b> Grafton 1996; Ogawa 1992; Smith 2009; Friston 1996; Spraker 2007; Portnow 2013; Rothwell 1991. Assignment of papers 8-11 for Week 4
Week 4 <i>Jan 31</i>	<b>NO Clinical: Zoom with Fixel Institute (Tuesday 8-9 am)</b> <b>Lecture:</b> Diagnosis of Parkinson's Disease <b>Presentations:</b> Burciu 2017; Mitchell 2021; Castellanos 2015; Du 2011 (only Burciu; Castellanos; Mitchell will be presented) (Read Du on your own). Assignment of papers 12 and 13 for Week 5
Week 5 <i>Feb 7</i>	<b>Clinical: Zoom with Fixel Institute (Tuesday 8-9 am)</b> <b>Lecture:</b> Pathophysiology of Parkinson's Disease <b>Presentations:</b> Bergman 1990; Kordower 2013 Assignment of papers 14a and 15a for Week 6
Week 6 <i>Feb 14</i>	<b>Clinical: Zoom with Fixel Institute (Tuesday 8-9 am)</b> <b>Guest Speaker:</b> Why alpha-synuclein therapies for PD? (Matthew Farrer, PhD) <b>Presentations:</b> Lang 2022; Pagano 2022 Assignment of papers 14b and 15b for Week 7
Week 7 <i>Feb 21</i>	<b>NO Clinical: Zoom with Fixel Institute (Tuesday 8-9 am) Feb 20</b> <b>Guest Speaker:</b> Dr. Tracy Tholanikunnel, RLS and Sleep Disorders <b>Lecture:</b> Treatments for Parkinson's Disease <b>Presentations:</b> Deuschl 2006; Olanow 2009 Assignment of papers 16-20 for Week 8
Week 8 <i>Feb 28</i>	<b>Clinical: Zoom with Fixel Institute (Tuesday 8-9 am)</b> <b>Presentations:</b> Corcos 2013; Li 2012; Rascol 2000; Herz 2014; Arpin 2021. Assignment of papers 21 for Week 10
Week 9 <i>March 6</i>	<b>Clinical: Zoom with Fixel Institute (Tuesday 8-9 am)</b> <b>Guest Speaker:</b> Dr. Josh Wong, DBS current and state of the art on March 6
Week 10 <i>March 20</i>	<b>Guest Speaker: Dr. Christopher Hess Lecture on Myoclonus on March 19</b> <b>NO Clinical: Zoom with Fixel Institute (Tuesday 8-9 am)</b> <b>Lecture:</b> Huntington's Disease <b>Presentation:</b> Rosas 2008. Assignment of paper 22 and 23 for Week 11
Week 11 <i>March 27</i>	<b>Clinical: Zoom with Fixel Institute (Tuesday 8-9 am)</b> <b>Lecture:</b> Tremor (Cerebellar Tremor, Essential Tremor, Psychogenic Tremor Only) <b>Presentations:</b> Groppa 2015; Favilla 2012. Assignment of papers 24, 25, 26 for Week 12
Week 12	<b>Clinical: Zoom with Fixel Institute (Tuesday 8-9 am)</b>

<i>April 3</i>	<b><u>Lecture:</u></b> Dystonia <b><u>Presentation:</u></b> Argyelan 2009, Carbon 2009, Caffall 2021
<b>Week 13</b> <i>April 10</i>	<b>Clinical: Zoom with Fixel Institute (Tuesday 8-9 am)</b> <b>Work on Projects. Setup meetings with Dr. Vaillancourt for Projects if need</b>
<b>Week 14</b> <i>April 17</i>	<b>Clinical: Zoom with Fixel Institute (Tuesday 9-10 am)</b> <b><u>Project Presentations 8:30 – 11:30</u></b>
<b>Week 15</b> <i>April 24</i>	<b>Clinical: Zoom with Fixel Institute (Tuesday 8-9 am)</b> <b><u>Project Presentations 8:30 – 11:30</u></b>
<b>Week 16</b>	<b>More <u>project presentations</u> if needed on final exam day</b>

## Papers for presentation

Week/Date	Material
<b>Week 3</b> <i>Jan 24</i>	Presentations: <ol style="list-style-type: none"> <li>1. Grafton et al. 1996. Localization of grasp representations in humans by positron emission tomography.</li> <li>2. Ogawa et al. 1992. Intrinsic signal changes accompanying sensory stimulation: Functional brain mapping with MRI.</li> <li>3. Smith, Fox et al 2009. Correspondence of the brain’s functional architecture during activation and rest.</li> <li>4. Friston et al 1996. Movement-Related Effects in fMRI Time-Series.</li> <li>5. Spraker et al. 2007. Role of individual basal ganglia nuclei in force amplitude generation.</li> <li>6. Portnow et al. 2013. The history of cerebral PET scanning.</li> <li>7. Rothwell et al. 1991. Stimulation of the human motor cortex through the scalp.</li> </ol>
<b>Week 4</b> <i>Jan 31</i>	Presentations: <ol style="list-style-type: none"> <li>8. Burciu et al. 2017. Progression marker of Parkinson’s disease: a 4-year multi-site imaging study.</li> <li>9. Castellanos et al. 2015. Automated neuromelanin imaging as a diagnostic biomarker for PD.</li> <li>10. Du et al. 2011. Combined R2 and diffusion tensor imaging changes in the substantia nigra in PD. (READ ON YOUR OWN)</li> <li>11. Mitchell et al 2021. Emerging Neuroimaging Biomarkers Across Disease Stage in Parkinson Disease.</li> </ol>
<b>Week 5</b> <i>Feb 7</i>	Presentations: <ol style="list-style-type: none"> <li>12. Bergman et al. 1990. Reversal of experimental parkinsonism by lesions of the STN.</li> <li>13. Kordower et al. 2013. Disease duration and the integrity of the nigrostriatal system in PD.</li> </ol>
<b>Week 6</b> <i>Feb 14</i>	Presentations: <ol style="list-style-type: none"> <li>14a. Pagano et al. 2022. Trial of Prasinezumab in Early-Stage PD.</li> <li>15a. Lang et al. 2022. Trial of Cinpanemab in Early PD.</li> </ol>
<b>Week 7</b> <i>Feb 21</i>	Presentations: <ol style="list-style-type: none"> <li>14b. Deuschl et al. 2006. A randomized trial of DBS for PD.</li> <li>15b. Olanow et al. 2009. A double-blind, delayed-start trial of rasagiline in PD.</li> </ol>
<b>Week 8</b> <i>Feb 28</i>	Presentations: <ol style="list-style-type: none"> <li>14. Corcos et al. 2013. A two-year randomized controlled trial of progressive resistance exercise for PD.</li> <li>15. Li et al. 2012. Tai Chi and postural stability in patients with PD.</li> <li>16. Rascol et al. 2000. A five-year study of the incidence of dyskinesia in patients with early PD who were treated with ropinirole or levodopa.</li> <li>17. Herz et al. 2014. The acute brain response to levodopa heralds dyskinesias in PD.</li> <li>18. Arpin et al. 2021. Diffusion Magnetic Resonance Imaging Detects Progression in Parkinson’s Disease: A Placebo-Controlled Trial of Rasagiline.</li> </ol>
<b>Week 10</b>	Presentation:

<b>March 20</b>	19. Rosas et al. 2008. Cerebral cortex and the clinical expression of Huntington's disease: complexity and heterogeneity.
<b>Week 11</b> <b>March 27</b>	Presentations: 20. Groppa et al. 2015. Physiological and anatomical decomposition of subthalamic neurostimulation effects in essential tremor. 21. Favilla et al. 2012. Worsening essential tremor following deep brain stimulation: disease progression versus tolerance.
<b>Week 12</b> <b>April 3</b>	22. Argyelan et al. 2009. Cerebellothalamocortical Connectivity Regulates Penetrance in Dystonia. 23. Carbon et al. 2009. Increased sensorimotor network activity in DYT1 dystonia: a functional imaging study. 24. Caffall et al. 2021. The HIV protease inhibitor, ritonavir, corrects diverse brain phenotypes across development in mouse model of DYT-TOR1A dystonia.