UNIVERSITY OF FLORIDA
COLLEGE OF MEDICINE SYLLABUS
NEUROSCIENCE
Disorders of the Developing Nervous System (GMS6073: 1 credit hour)
Semester: Fall 2021
Delivery Format: Online

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Office Hours: Arranged by student request
Graduate Assistant: n/a
Preferred Course Communications: Email
Prerequisites : Students in this course should have a basic understanding of cell biology. Students are usually required to take GMS6021 (Principles of Neuroscience 1: Organization and Development of the Nervous System) as a prerequisite, unless they can provide evidence of a similar background course in neurodevelopment.

Course Overview

This course (GMS6073) is organized into five modules, each of which covers major areas of brain development and disorders that may arise. Each module includes Voice Thread (VT) lectures, self-check quizzes, and reading assignments. Our goal is to help you obtain an advanced knowledge in the field of developmental neurobiology that will allow you to appreciate the significance of questions and emerging findings in this field, and enable you to pursue in-depth studies of specific topics in this field.

Relation to Program Outcomes
This course has been designed to provide an advanced foundation in Developmental Neuroscience for MS and PhD graduate students pursuing a Neuroscience-related degree, as well as students enrolled in the online UF Biomedical Neuroscience Certificate and Masters Degree programs. Graduate students in other UF colleges and interested advanced undergraduate students with a neuroscience background are encouraged to inquire about registration.

Course Objectives and Goals
This course will cover advanced topics in the field of neurodevelopment and is intended to be a sequel to GMS6021 (Principles of Neuroscience I: Organization and Development of the CNS). The objective of the course is to provide students with an advanced understanding of

fundamental processes underlying brain development, primarily at a molecular and cellular level. We will focus on primary literature that relates to major neurodevelopmental disorders, and the disruption of biological processes that underlie these disorders. Students should gain an appreciation for how identification of new gene/protein function has led to major advances in understanding CNS development and why development goes awry in certain diseases. Topics for discussion will relate to neural tube development, ventricle and cerebral spinal fluid (CSF) development, neurogenesis and migration, and how genetic mutation and environmental insult affect a normally developing nervous system.

At the end of this course you will be able to answer the following questions:

- What are the molecular and cellular mechanisms that ensure normal neural tube folding and closure? How do disruptions in this process lead to neural tube defects?

- How do the ventricles form, generate and mediate flow of cerebral spinal fluid? How do disruptions of this process lead to hydrocephaly?

- How does the cerebral cortex specify the right number of neural cell types and correctly position them in the cortex? How does failure of this process lead to a spectrum of cortical malformations?

- How do chromosomal anomalies such as Trisomy affect normal brain development? What are the mechanisms underlying Down Syndrome?

- How do changes in oxygen and blood flow during the perinatal period alter the trajectory of brain development, e.g. in Cerebral Palsy?

Instructional Methods

This is a 5-6 week course divided into 5 modules. You will be completing one module each week, each of which covers a specific topic within the field of neurodevelopment. Each module is broken down into 2-3 subunits in an effort to improve your ability to access and understand the information contained. This online course has been designed to allow you maximum flexibility over your learning experience. Face-to-face can be scheduled with the instructors as needed.

Each unit contains a reading assignment, a video lecture in VoiceThread format, and a self-check quiz that will allow you to determine how well you have understood the material presented in the unit. Each VoiceThread lecture is ~10-15 min in duration but can be easily viewed slide-by-slide. You will complete the five modules sequentially, and each module will be considered complete <u>when you have taken the unit self-check quizzes.</u>

The self-check quizzes, which are due each Friday at 11:59 pm, will constitute 30% of your grade. Seventy % of the final grade will be derived from weekly primary literature assignments.

For each module/topic, we will assign you 1 or 2 primary literature articles for that week. You will write and post a 800-1000 word essay on the assigned article. We will evaluate the quality and content of your essays using grading rubric that will be available to you as guides for your work on these assignments.

How to succeed in this online course

First, you need to be aware that online learning poses its own unique challenges. Because the online classroom is available to you 24 hours a day it is easy to delay work on course material, to forget deadlines, and to fail to put sufficient time into your studies to perform well on exams and assignments. These challenges are exacerbated when a student is not a 'self-starter' or does not possess good time management skills, including use of reminders.

Unlike traditional instructional settings in which each student goes to the same class, the online setting enables every student to "create" the class of his or her choosing. In theory, this type of instruction should be more adaptable to a variety of learning styles; however, the reality is that some students have not yet determined what their optimal learning style is.

It is our observation that poor performance in online courses is often directly linked to poor time management (trying to do a week's worth of work just before the deadline). Rushing to complete assignments before the 11:59 pm deadlines is not a good strategy for success. In doing this you forfeit your opportunity to ask questions about material you do not understand. Being able to ask questions both on the lecture slides and on the module question discussion boards and receiving answers from the instructors in a timely manner is a terrific feature of online learning. Completing the self-check quizzes during the work week can help you to identify subject matter that is not clear to you. In general, we will answer your posted questions within 12-24 hours of your posting – often much more quickly.

You are expected to adhere to the posted assignment deadlines; however, you should note that the self check quizzes associated with each Module can be completed at your own pace over the course of each week. The self-check quizzes associated with each Module are due Fridays at 11:59 pm.

Description of Course Content:

Week	Date(s)	Topic(s)	Readings
1	Oct 29	Course Introduction, Syllabus and Deadlines	Assigned readings from primary literature:

		Module 1: Neurulation and Neural Tube Defects Unit 1: Overview of neurulation Unit 2: Intro to NTDs, Epidemiology, Symptoms, and Pathology Unit 3: Emerging Treatments and Prevention of NTDs	Copp et al., *Nat Rev Genet* 2003; 4: 784-93. Gamero-Estevez E, et al., *Reprod Toxicol* 2018; 81: 155-167. Sudiwala et al., *Dis Model Mech* 2019; 12, dmm042234. Assignment due: Peer Review due:
2	Nov 8	**Module 2: CSF development/flow and Hydrocephalus** Unit 1: Overview of ventricle development, CSF generation/flow, Unit 2: Intro to Hydrocephalus, epidemiology, symptoms, and pathology Unit 3: Etiology and Emerging Treatment	Assigned readings from primary literature Korzh V. Cell Molec Life Sci. 2018; 75: 375-383. Lun et al., Nat Rev Neurosci 2015; 16: 445-457. Wang et al., *Brain Res* 2014; 1569: 48-56 Olstad EW et al., *Curr Biol* 2019; 29: 229-241. Assignment due: Peer Review due:
3	Nov 15	**Module 3: Neurogenesis, Neuronal Migration and Cortical Malformations** Unit 1: Overview of neurogenesis and migration. Unit 2: Intro to Cortical malformations, epidemiology, symptoms, and pathology	Assigned readings from primary literature Kriegstein A, Alvarez-Buylla, A. *Ann Rev Neurosci* 2009. 32: 149-184. Severino et al., Brain 2020. Doi: 10.1093/brain/awaa174 Manent et al., *Nat Med* 2009; 15: 84-90. Cho et al, *Nat Comm* 2014; 6: 6606.

			Assignment due: Peer Review due:
4	Nov 22	**Module 4: Trisomy and early Brain Development: Down Syndrome (DS)** Unit 1: Intro to DS Unit 2: Models and brain pathology associated with DS	Assigned readings from primary literature Haydar TF, Reeves RH. *Trends Neurosci* 2012 35: 81-91. Baburamani et al., Dev Med Child Neurol 2019; 61: 867-879. Izzo et al. *Hum Molec Genet* 2017; 26: 1056-69. Parrini M et al., *Sci Rep* 2017; 7: 16825. Assignment due: Peer Review due:
5	Dec 6	**Module 5: Acquired Neurodevelopmental Disorders: Cerebral Palsy** Unit 1: Clinical features of HIE and Cerebral Palsy Unit 2: Cellular processes disrupted by HIE	Assigned readings from primary literature Silbereis JC et al., *Dis Model Mech* 2010 3: 678-688. Li et al., *Cell Cycle* 2019; 18: 2849-59 Assignment due: Peer Review due:

Course Materials and Technology:

Suggested Reading Material

Sanes, Reh, and Harris (2019) **Development of the Nervous System** Fourth Edition Elsevier
ISBN: 978-0-12-8040287

Rubenstein and Rakic (2020) **Neurodevelopmental Disorders** First Edition, Elsevier. Hardcover
ISBN 9780128144091 (eBook ISBN: 978012814407).

Required Technology

- Laptop or desktop computer equipped with microphone and video camera. A microphone and video camera may be used to post comments to VoiceThread and for online Face-2-Face meetings if requested.
  a. There is a Canvas app that can be used to access the course.
  b. There are VoiceThread apps that are available for iOS and Android devices that can be used to view and post comments on VTs. While these portable devices are excellent for watching lectures and asking questions, we strongly recommend that you use laptop or desktop computers when working on this course.

- High speed, broadband internet connection such as DSL or cable. We highly recommend that you use a broadband, stable Internet connection when taking exams.
  c. SPECIAL NOTE: Some users with satellite Internet service may find their online courses do not load quickly or consistently due to satellite network issues.

- It is highly recommended that you work with Canvas and VT through the **Firefox or Chrome Browsers.** For specific questions about browser compatibilities and general questions about e-learning at UF please visit https://wiki.helpdesk.ufl.edu/FAQs/E-Learning.

- You should also make sure you have the **most recent version of Adobe Flash player** installed on your computer. Adobe Flash player can be downloaded from this website.

For additional technical support for this class, please contact the UF Help Desk at:

- Learning-support@ufl.edu
- (352) 392-HELP - select option 2
- UF eLearning

Academic Requirements and Grading

Assignments and Grading

For each of the 5 modules, students will complete a self-check Module quiz. Self-check quizzes are due each Friday by 11:59 pm.

The scores from the self-check quizzes will be weighted to represent 30% of your grade. Seventy percent of your course grade will come from weekly assignments that you will submit after review of primary literature. You will be given grading rubrics for these assignments so

that you will understand what is required to successfully complete these assignments and how they will be evaluated.

Weighting of course assignments (% of final grade)

Unit Self-check Quizzes: 30% Grade

Weekly Assignments: 70% Grade

Assignments, quizzes and tests will not be accepted late.

All self-check quizzes for a module are due Fridays at 11:59 pm. You will be able to view the correct answers for all quizzes that you submit for 24 hours starting at 12:01 am on the Saturday following the Friday on which they are due. Self-check quizzes not completed by the Friday 11:59 deadline will result in zeros for those quizzes.

As a rule, unless you have a medical excuse or a confirmed family emergency with appropriate documentation, we will not accept late assignments, quizzes, and tests. We recognize that personal circumstances arise that may interfere with your ability to meet a deadline. If this occurs, please let us know as soon as you know – preferably a minimum of 24 hrs prior to the deadline. We will not be receptive to retrospective requests for deadline extensions. Your emails will be responded to within 24 business hours (typically sooner).

If you encounter computer technical difficulties, be sure to include a UF helpdesk ticket number in your request for a deadline extension if you plan to request one. The extension request MUST be submitted within 24 hours of the technical difficulty.

Grading scale

A letter grade will be given at the end of the course that will reflect the weighted percentages of the points you have earned:

93-100% = A

90-92%= A-

87-89% = B+

83-86% = B

80-82% = B-

77-79% = C+

73-76% = C

70-72% = C-

67-69% = D+

63-66% = D

<63% =E

Grading Policy:

Students will be expected to complete <u>all requirements for one module each week</u>. There will be no deadline extensions for completion of a module unless granted by the course directors prior to the scheduled completion date. You will receive zeros for failure to submit module self-check quizzes or assignments by their deadlines in the absence of an approved excuse.

More information on UF grading policy may be found at:

http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#grades

Policy Related to Required Class Attendance:

This course is entirely online and is asynchronous. Thus there is no formal class attendance policy. Requirements for make-up quizzes, 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

Excused absences must be consistent with university policies in the Graduate Catalog (http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#attendance). Additional information can be found here:
https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

Expectations Regarding Course Behavior:

Communication Guidelines

WHEN DO I CONTACT THE UF HELPDESK?
In the event that you have **technical difficulties with E-learning**, please contact the UF helpdesk at learning-support@ufl.edu, or (352) 392-4357 - select option 2. If your technical difficulties will cause you to miss a due date, you MUST report the problem to E-learning. Include the

ticket number that you are given in an e-mail to the instructor to explain the late assignment/quiz/test.

Types of questions that should be directed to the Help Desk:

1. I can't log into E-learning
2. I have clicked on the "submit" button for my quiz and nothing is happening
3. I can't upload an assignment (be sure that you have reviewed the tutorial on how to do this BEFORE you contact the Help Desk)
4. E-learning has given me an error message and I can't submit my assignment.

NOTE: _Late work that involves technical difficulties with E-learning MUST be accompanied by a ticket number from the Help Desk._

ALSO _- Be sure to be familiar with the hours of operation for the UF help desk since they are oftentimes not available after 10:30pm on workdays and after 8:00 pm on weekends. There hours are posted at_ http://helpdesk.ufl.edu/about/business-hours/

WHEN DO I POST QUESTIONS TO THE COURSE QUESTIONS DISCUSSION BOARD?
Questions that deal with the course itself should be submitted to the Course Questions board. Posted questions should NOT be about grades or a private matter. Do not post personal grade questions on the Course Questions discussion board.

Before posting a question, check those already posted to be sure that you are not duplicating a question. These should be things that other students in the class might have trouble with. For example:
1. I am unable to post comments to VoiceThread.
2. The link to specific VoiceThread is not working.
3. One of the quiz questions did not display properly.

Posting on the Course questions board is the fastest way to get an answer to your question. Be sure to give it a meaningful heading!

Questions of a private nature should be e-mailed to the course instructor (see below on how to e-mail within E-learning). In all cases, please allow 24 hours for a response. Every effort will be made to answer questions posted over the weekend with 24 hours. If not addressed, they will be addressed on the following Monday.

WHEN DO I EMAIL MY INSTRUCTOR?
Questions about the course should be e-mailed to the instructor through the e-mail tool in E-learning.
Examples of e-mail questions for the instructor to get clear, concise responses:

1. I think there is an error in my grade for the assignment in module 3 (be sure to explain exactly why you think there is an error and provide documentation)
2. I am behind in the course and I would like to know how I may catch up (in such a case, your instructor may ask you to set up a Skype meeting or a time to call on the telephone)

If you have questions about the course itself, please reread the syllabus before asking a question. If the answer is not in the syllabus, check the Course Questions discussion board (this discussion board can be located by clicking on the discussions menu tab on the left of the course home page). If the answer to your question is not there, please post the question on the Course Questions discussion board.

DO NOT e-mail the instructor with general course questions. If your question is of a personal nature, e-mail your instructor from within e-learning system using the instructions below. Late work that involves technical difficulties with E-learning MUST be accompanied by a ticket number from the Help Desk.

HOW TO EMAIL YOUR INSTRUCTOR
When emailing your instructor, please do so through Canvas.
To send an e-mail from the course:
1. Click on the mail icon that is located the left side of your screen.
2. Click the "Compose Message" button.
3. "To: window" will display.
4. Locate your instructor's name.
5. Always include a description in your subject line
6. Type your message and add any necessary attachments. Be sure that your subject line is meaningful.
7. Click "send."

Academic Integrity:

PLAGIARISM
Weekly assignments involve review of the primary literature to formulate their own essay for each topic. Students must understand what plagiarism is and must not engage in this behavior when completing assignments in this course. The University of Florida Student Honor Code states that plagiarism includes but is not limited to:

1. Quoting oral or written materials including but not limited to those found on the internet, whether published or unpublished, without proper attribution.

2. Submitting a document or assignment that in whole or in part is identical or substantially identical to a document or assignment not authored by the student.

Student whose assignments/tests exhibit evidence of plagiarism will receive zeros for those assignments and tests for the first offense and will receive a warning. Students who continue to

engage in this behavior after the first warning will be reported to the UF Dean of Students Office.

PROHIBITED COLLABORATION OR CONSULTATION

Student found to be involved in sharing answers and/or collaborating on assignments will receive zeros for those exams and assignments. Students who continue to engage in this behavior after the first warning will be reported to the UF Dean of Students Office.

Students are expected to act in accordance with the University of Florida policy on academic integrity. As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge:

 "**We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity**."

You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied:

 "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For additional information regarding Academic Integrity, please see Student Conduct and Honor Code or the Graduate Student Website for additional details:
https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/
http://gradschool.ufl.edu/students/introduction.html

Please also review the use of copyrighted materials, which can be found on the Health Science

Center Library's web page:

http://www.library.health.ufl.edu/services/copyright.htm

Please remember cheating, lying, misrepresentation, or plagiarism in any form is unacceptable and inexcusable behavior.

Online Faculty Course Evaluation Process:
Students are **<u>expected</u>** to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/ . Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

Support Services:

Accommodations for Students with Disabilities:
Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center by visiting https://disability.ufl.edu/students/get-started/ . It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester. The College is committed to providing reasonable accommodations to assist students in their coursework.

Counseling and Student Health:
Students sometimes experience stress from academic expectations and/or personal and interpersonal issues that may interfere with their academic performance. If you find yourself facing issues that have the potential to or are already negatively affecting your coursework, you are encouraged to talk with an instructor and/or seek help through University resources available to you.

- The Counseling and Wellness Center 352-392-1575 offers a variety of support services such as psychological assessment and intervention and assistance for math and test anxiety. Visit their web site for more information: http://www.counseling.ufl.edu. On line and in person assistance is available.

- You Matter We Care website: http://www.umatter.ufl.edu/. If you are feeling overwhelmed or stressed, you can reach out for help through the You Matter We Care website, which is staffed by Dean of Students and Counseling Center personnel.

- The Student Health Care Center at UF Health is a satellite clinic of the main Student Health Care Center located on Fletcher Drive on campus. Student Health at UF Health

offers a variety of clinical services. The clinic is located on the second floor of the Dental Tower in the Health Science Center. For more information, contact the clinic at 392-0627 or check out the web site at: https://shcc.ufl.edu/

- UF Health Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road,Gainesville, FL 32698, ufhealth.org/emergency-room-trauma-center.

- University Police Department: Visit police.ufl.edu/ or call 352-392-1111 (or 9-1-1 for emergencies).

- Crisis intervention is always available 24/7 from:

  Alachua County Crisis Center:
  (352) 264-6789
  http://www.alachuacounty.us/DEPTS/CSS/CRISISCENTER/Pages/CrisisCenter.aspx

Do not wait until you reach a crisis to come in and talk with us. We have helped many students through stressful situations impacting their academic performance. You are not alone so do not be afraid to ask for assistance.

Academic Resources

E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services career.ufl.edu/.

Library Support: cms.uflib.ufl.edu/ ask various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center: Broward Hall 352-392-2010 or to make an appointment 352 392-6420. General study skills and tutoring. teachingcenter.ufl.edu/

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers. writing.ufl.edu/writing-studio/

Student Complaints On-Campus: sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/

On-Line Students Complaints: distance.ufl.edu/student-complaint-process