



**School of Medicine
and Public Health**
UNIVERSITY OF WISCONSIN-MADISON

OBS&GYN 711

Advanced Reproductive Endocrine Physiology

COURSE INFORMATION

Credits: 2

Meeting Time and Location: 12:30 p.m. - 2:30 p.m., T; 6152 Med Sci Ctr, 1300 University Avenue. **Odd Semesters.**

Course Designations and Attributes: Graduate Standing Only.

Requisites: Graduate/Professional standing.

Instructional Mode: This course is conducted face-to-face and does not involve any blended learning.

How this course meets the credit hour policy standard: Option A - Class will meet for 2 hours per week over the semester. This will include direct instructor contact. It is expected that students will work on course activities (reading, identifying and analyzing articles, development and practicing presentation, writing final project, etc) outside of the classroom for about 4-6 hours per week.

INSTRUCTORS AND TEACHING ASSISTANTS

Course Director:

Manish Patankar, Professor of Obstetrics and Gynecology

patankar@wisc.edu, Box 6188 Clinical Science Center, 600 Highland Avenue (office hours available upon request)

This course is team-taught by lecturers with expertise in each given subject area. Consistent with the reproductive theme of this course, at least half of the instructors are from the OBGYN department; additional instructors are Endocrinology and Reproductive Physiology graduate training program faculty. Specific instructors for Spring 2021 are listed in the course meeting table below.

Instructor/s Availability: Depending on the topic/theme for the semester's offering, Course Director will either teach the course themselves or team-teach with other ERP faculty. In either scenario, Course Director will regularly attend class meetings to ensure course objectives are met and student performance is evaluated consistently. Office hours are available upon request. Course director and instructors will have direct student contact throughout this course.

COURSE DESCRIPTION

Advanced learning opportunities in Endocrinology and Reproductive Physiology (ERP) areas, particularly reproduction, with an emphasis on human health whenever possible. Explore scientific questions core to the ERP graduate training program at research level with further in-depth instruction and a focus on cutting-edge knowledge and developments. Topics include pregnancy (ovulation through parturition); embryonic growth and development; lactation biology; and neuroendocrinology. Continuation of OBS&GYN 710. Intended for second- or third-year graduate students.

COURSE LEARNING OUTCOMES

1. Develop deep understanding of a reproduction topic.
2. Evaluate primary research articles and demonstrate critical reasoning with regard to methods and conclusions.
3. Demonstrate critical thinking with regard to course material through in-class interactive discussion with peers and faculty.
4. Integrate instruction material and personally-researched scientific texts to formulate individual thoughts on topics not directly covered in lecture.

This is consistent with Endocrinology and Reproductive Physiology (ERP) Program outcomes in that, by graduation, ERP students are expected to thoroughly understand endocrine systems and reproductive physiology from the whole animal level down to the subcellular signaling proteins and pathways responsible for physiological outcomes. This course focuses primarily on advanced topics related to reproduction and pregnancy.

GRADING

Grades are assigned using the following criteria:

Exams	50%
Student Presentations	30%
Other Learning Activities	10%
<u>Participation</u>	<u>10%</u>
Total	100%

Take-Home Exams. Examination will consist of one take-home exam for each module (non-cumulative). Students may utilize any allowable resources at their disposal in order to construct their answers. Answers will be graded with this in mind and sufficiently researched and in-depth answers with originally constructed ideas will be expected as a result. Detailed instructions and expectations will be provided by the instructor in advance. Each exam will consist of 1-2 essay questions per lecture and students will have 1 week to return their answers in a private BOX folder. Answers for each question will be graded by the instructor of that lecture and posted in a private BOX folder.

Student Presentations. Students will undertake a presentation exercise for each module. Presentations will be based on relevant readings and, as determined by the instructors, may be assigned by the instructor or selected by the students. Presentation requirements (e.g., format; required components; duration; and method of delivery) will be clearly delineated by the instructors in advance.

Other Learning Activities. Additional learning activities will be selected by the instructors, to ensure students meet the learning goals for each course offering. Examples of potential learning activities include engaging in and facilitating small- or whole-group discussions, engaging in journal clubs, and completing short in-class or homework assignments.

Participation. Students are required to actively participate throughout the semester. Students are expected to ask clarifying questions, probe scientific implications and contributions, help make connections between topics, and provide thoughtful analyses of reading assignments. Classes devoted to case studies will be highly dependent on student participation and students should be ready to carry the conversation for longer periods of time. Outstanding participants will always achieve these benchmarks; a good contributor will usually achieve these benchmarks; an adequate contributor will sometimes achieve these benchmarks; an unsatisfactory participant rarely achieves these benchmarks.

This course is graded on the A-F grading scale. Assignment and final grades are not curved.

A:	90% - 100%
A/B:	85% - 89%
B:	75% - 84%
B/C:	70% - 74%
C:	60% - 69%
D:	50% - 59%
F:	0% - 49%

REQUIRED READING & RECOMMENDED TEXTS

This course is taught by many contributors on areas of reproductive endocrinology physiology. As the course theme may change from semester to semester, course directors are responsible for providing relevant readings in advance of the course. These readings will be made available to students free of charge. Students will identify further readings relevant to their course projects. Similarly, there is no recommended textbook. As this is an advanced topics course, knowledge gained from other, scientifically relevant classes should provide a broad basis for understanding of the topics.

It is expected that students in this course have a basic understanding in biochemistry, molecular biology, and physiology, as well as the understanding of basic concepts in general endocrinology and reproduction.

LEARNING ACTIVITIES/COURSE HOURS

General Meeting Schedule

Date	Learning Activity	Instructors
Meeting 1	Introduction, Lecture 1	Course Director
Meeting 2	Lecture 2	Course Directors/Instructors
Meeting 3	Lecture 3	Course Directors/Instructors
Meeting 4	Lecture 4	Course Directors/Instructors
Meeting 5	<i>Student Presentations</i>	
Exam 1		
Meeting 6	Lecture 5	Course Directors/Instructors
Meeting 7	Lecture 6	Course Directors/Instructors
Meeting 8	Lecture 7	Course Directors/Instructors
Meeting 8	Lecture 8	Course Directors/Instructors
Meeting 9	<i>Student Presentations</i>	
Exam 2		
Spring Break – No Meeting		
Meeting 10	Lecture 9	Course Directors/Instructors
Meeting 11	Lecture 10	Course Directors/Instructors
Meeting 12	Lecture 11	Course Directors/Instructors
Meeting 13	Lecture 12	Course Directors/Instructors
Meeting 14	<i>Student Presentations</i>	
Exam 3		

Note: Number of modules and scheduling of learning activities will vary by course topic and instructors.

ACADEMIC INTEGRITY

By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison's community of scholars in which everyone's academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review. For more information, refer to studentconduct.wiscweb.wisc.edu/academic-integrity/.

ACCOMODATIONS FOR STUDENTS WITH DISABILITIES

The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty [me] of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty [I], will work either directly with the student [you] or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA.

DIVERSITY AND INCLUSION

Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals.

The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world.

SPRING 2021 COURSE INFORMATION

Instructors for Spring 2021

Course Director:

Manish Patankar, Professor of Obstetrics and Gynecology

patankar@wisc.edu, Box 6188 Clinical Science Center, 600 Highland Avenue (office hours available upon request)

Theme – Pregnancy

Emphasis on:

An in-depth understanding of all stages of pregnancy

Consideration of physiological principles necessary for successful reproductive outcomes, including required physiological adaptations; immunology and the maternal/fetal interface; and lactation biology

Case studies of healthy and pathologic pregnancies and their outcomes

Date	Lecture	Instructors
January 19, 2021	Introduction to Class; Placentation and Endocrinology and Comparative Placentation	Dr. Derek Boeldt
January 26, 2021	Angiogenesis, Growth Factors, and Pregnancy	Dr. Jing Zheng
February 2, 2021	Maternal Recognition of Pregnancy	Dr. Milo Wiltbank
February 9, 2021	<i>Student Presentations: Maternal Recognition of Pregnancy</i>	Dr. Milo Wiltbank
February 16, 2021	<i>Student Presentations: Maternal Recognition of Pregnancy</i>	Dr. Milo Wiltbank
Exam 1		
February 23, 2021	Physiologic Changes in Pregnancy (Renin-Angiotensin system)	Dr. Dinesh Shah
March 2, 2021	Immunology of Pregnancy-I	Dr. Manish Patankar
March 9, 2021	Immunology of Pregnancy-II	Dr. Aleksandar Stanic-Kostic
March 16, 2021	<i>Student Presentations: Immunology of Pregnancy</i>	Drs. Patankar and Stanic-Kostic
March 23, 2021	Case Studies: Parturition	Dr. Kara Hoppe
March 30, 2021	Spring Break	
Exam 2		
April 6, 2021	Autocrine Control of Milk Synthesis	Dr. Laura Hernandez
April 13, 2021	Lactogenesis Milk Synthesis-I	Dr. Laura Hernandez
April 20, 2021	Lactogenesis Milk Synthesis-I	Dr. Laura Hernandez
April 27, 2021	<i>Student Presentations: Milk Synthesis</i>	Drs. Patankar and Stanic-Kostic

Exam 3

Representative Readings: Manuscripts and chapters will be assigned by the presenters throughout the course. A sample list of readings is provided below. This list is not exhaustive, and additional readings will be assigned during the semester.

- Casey ML and MacDonald PC. 1993. Chapter 7: Placental Endocrinology. *The Human Placenta: A Guide for Clinicians and Scientists*. Redman, Sargent and Starkey, eds. Blackwell Scientific Publications : Oxford. Pp 237-272.
- Evain-Brion D, Malassine A. Human Placenta as an Endocrine Organ. *Growth Hormone and IGF Research* 13 (2003) S34-S37.
- Burton GJ, Kaufmann P, Huppertz B. 2005. Chapter 5: Anatomy and Genesis of the Placenta. *Knight and Neill's Physiology of Reproduction*. Neill, ed. 3rd edition. Elsevier. Pp 189-243.
- Costa MA. The Endocrine Function of Human Placenta: An Overview. *Reproductive Biomedicine Online* (2016) 32, 14-43.
- Kaufman P, Black S, Huppertz B. Endovascular Trophoblast Invasion: Implications for the Pathogenesis of Intrauterine Growth Retardation and Preeclampsia. *Biology of Reproduction* (2003) 69, 1-7.
- Reynolds LP, Borowicz PP, Vonnahme KA, Johnson ML, Grazul-Bilska AT, Redmer DA, Caton JS. Placental Angiogenesis in Sheep Models of Compromised Pregnancy. *J Physiol* (2005) 565.1, 43-58.
- Shibuya M. Vascular Endothelial Growth Factor (VEGF) and Its Receptor (VEGFR) Signaling in Angiogenesis: A Crucial Target for Anti- and Pro-Angiogenic Therapies. *Genes and Cancer* (2011) 2(12), 1097-1105.
- Irani RA, Yang X. Renin Angiotensin in Normal Pregnancy and Preeclampsia. *Semin Nephrol*. 2011 January ; 31(1): 47-58.
- Keyes PL, Possley RM, Brabec RK. The Roles of Prolactin and Testosterone in the Development and Function of Granulosa Lutein Tissue in the Rat. *Biology of Reproduction* (1987) 37, 699-707.
- Practice Bulletin 137: Gestational Diabetes Mellitus. Committee on Practice Bulletins – Obstetrics. American College of Obstetricians and Gynecologists. August 2013, Reaffirmed 2015.
- Practice Bulletin 60: Pregestational Diabetes Mellitus. Committee on Practice Bulletins – Obstetrics. American College of Obstetricians and Gynecologists. March 2005, Reaffirmed 2016.
- Smith R. Parturition. *NEJM* 2007; 356:271-283.
- Stegers EAP, von Dadelszen P, Duvekot JJ, Pijnenborg R. Pre-eclampsia. *Lancet* 2010;376:631-644.
- Diri H, Karaca Z, Tanriverdi F, Unluhizarci K, Kelestimur F. Sheehan's Syndrome: New Insights into an Old Disease. *Endocrine* (2016) 51:22-31.
- Inman JL, Robertson C, Mott JD, Bissell MJ. Mammary Gland Development: Cell Fate Specification, Stem Cells and the Microenvironment. *Development* (2015) 142, 1028-1042.
- Freud AG, Caliguri MA. Human Natural Killer Cell Development. *Immunological Reviews*. 2006;214:56-72.
- Koopman LA et al. Human Decidual Natural Killer Cells Are a Unique NK Cell Subset with Immunomodulatory Potential. *Journal of Experimental Medicine*. 2003;198:1201-1212.
- Hiby SE, et al. Combinations of Maternal KIR and Fetal HLA-C Genes Influence the Risk of Preeclampsia and Reproductive Success. *Journal of Experimental Medicine*. 2004; 200:957-965.
- Le Bouteiller P, Tabiasco J. Killers Become Builders during Pregnancy. *Nature Medicine*. 2006;12:991-992.
- Moffett A, Hiby SE, Sharkey AM. The Role of the Maternal Immune System in the Regulation of Human Birthweight. *Phil Trans R Soc B*. 2014;370.