1. Course Information

**Physiology 4640A: Organogenesis in Mammals**  
Fall Term 2015

This course examines the mechanisms underlying the development of selected organs and organ systems in mammals. Emphasis is on the molecular, biochemical and morphological maturation pathways that equip each system for its physiological role. Various experimental techniques/approaches relevant to Developmental Biology will be presented and discussed.

**Lectures:**
Tuesdays / 2:30-4:20 pm / Medical Sciences Building (MSB), room 384

**Requisites:**
Suggested Prerequisite(s): Physiology 3120, 3130Y and Physiology 3140A.

Senate regulation regarding the student’s responsibility regarding requisites:
Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the prerequisites.

*Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.*

2. Instructor Information

<table>
<thead>
<tr>
<th>Instructors</th>
<th>Email</th>
<th>Office</th>
<th>Phone</th>
<th>Office Hours*</th>
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<tbody>
<tr>
<td>Dr. Dean H. Betts</td>
<td><a href="mailto:dean.betts@schulich.uwo.ca">dean.betts@schulich.uwo.ca</a></td>
<td>DSB 2022</td>
<td>661-2111 Ext. 83786</td>
<td>After Lectures MSB 384</td>
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<tr>
<td>(Course Coordinator)</td>
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<tr>
<td>Dr. Chris Pin</td>
<td><a href="mailto:cpin@uwo.ca">cpin@uwo.ca</a></td>
<td>VRL A5-134</td>
<td>685-8500 Ext. 53073</td>
<td>After Lectures MSB 384</td>
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<tr>
<td>Dr. Tom Drysdale</td>
<td><a href="mailto:tadrysda@uwo.ca">tadrysda@uwo.ca</a></td>
<td>VRL A5-138</td>
<td>685-8500 Ext. 55072</td>
<td>After Lectures MSB 384</td>
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* or by appointment; # TA = teaching assistant

**OWL (powered by Sakai):**
Students with OWL issues should contact the Computer Support Centre at 519 661-3800 or fill out the webform: [https://servlet.uwo.ca/vistahelpdesk/controller.jsp](https://servlet.uwo.ca/vistahelpdesk/controller.jsp) (cut and paste this link)
3. Course Syllabus

Course Objectives:
The main objective of this course is to introduce students to the basic molecular, biochemical and morphological events that govern organ development. Additional objectives are to improve the ability of students to read and understand primary scientific literature and to provide students with an opportunity to conceptually translate their knowledge in organogenesis to solve developmental problems/questions. The course material will include didactic lecturing, analysis of primary research journal articles and class discussions. Students will be expected to come prepared to discuss the content of journal articles in class as well as independent work outside of the lectures. The lectures will focus mainly on the factors that govern development of the heart, nervous system, pancreas, muscle, and gonads although many topics can be applied to the development of other organ systems.

After completion of this course the student will understand:

- The fundamental mechanisms that govern tissue/organ development
- The various techniques/technologies utilized to study organogenesis and developmental biology
- How to navigate through and understand a scientific publication
- How to create testable hypotheses and design experiments

Method of Presentation

The material of the course will be presented in the form of didactic lectures; problem based learning exercises from the published scientific literature and informal class discussions.

Methods of Evaluation

Students will be expected to:

- Actively participate in regular classroom discussions
- Prepare written and oral presentation assignments
- Apply the understanding of learned basic science to attempt to solve developmental problems
- Read assigned scientific papers prior to class
- Utilize current scientific literature in preparing assignments
- Write, in short answer essay format, mid-term and final examinations
# Lecture Schedule

Tuesdays 2:30-4:30 pm, MSB 384 Medical Sciences Building (MSB)

<table>
<thead>
<tr>
<th>DATE</th>
<th>TOPIC (Instructor)</th>
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<tr>
<td>15 Sept.</td>
<td>Course Introduction (Betts); Principles of embryogenesis and organogenesis including gastrulation and germ layer formation (Drysdale)</td>
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<tr>
<td>22 Sept.</td>
<td>Development of the heart (Drysdale)</td>
</tr>
<tr>
<td>29 Sept.</td>
<td>Development of the nervous system (Drysdale)</td>
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<tr>
<td>06 Oct.</td>
<td>Germ cell development (Betts)</td>
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<tr>
<td>13 Oct.</td>
<td>Germ cell migration (Betts)</td>
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<tr>
<td>20 Oct.</td>
<td><em>Student Presentations (Assignment 1)</em></td>
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<tr>
<td>27 Oct.</td>
<td><em>Student Presentations (Assignment 1)</em></td>
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<tr>
<td>03 Nov.</td>
<td>Sex determination and gonad development (Betts)</td>
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<tr>
<td><strong>05 Nov.</strong></td>
<td><strong>Mid-term exam, 7-9 pm, Location: TBA</strong> (questions based on first 7 lectures)</td>
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<tr>
<td>10 Nov.</td>
<td>Epigenetic alterations and germline stem cells (Betts)</td>
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<tr>
<td>17 Nov.</td>
<td>Limb development focusing on muscle differentiation (Pin)</td>
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<tr>
<td>24 Nov.</td>
<td>Transcription factors that govern development (Pin)</td>
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<tr>
<td>01 Dec.</td>
<td>Endoderm development into liver and pancreas (Pin)</td>
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<tr>
<td>08 Dec.</td>
<td>External factors affecting cell fate (Pin)</td>
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*Journal papers for these lectures will be made available on WebCT at least the week before the lecture*
4. Course Materials

Textbook: None required

Suggested Textbooks:


Supplemental Information: Published journal articles will be provided for downloading from WebCT as required reading for lectures.

Students are encouraged to peruse the scientific literature and read review and/or primary research articles in developmental biology and organogenesis fields.

5. Evaluation:

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<th>Component</th>
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<tr>
<td>Assignment 1</td>
<td>October 20th and 27th</td>
<td>20%</td>
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<tr>
<td>Assignment 2</td>
<td>December 1st</td>
<td>10%</td>
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<tr>
<td>Mid-term exam</td>
<td>Nov. 5th, 2015, 7-9 pm, TC 341</td>
<td>30%</td>
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<tr>
<td>Final exam</td>
<td>TBA (Dec 6 – 17, 2014)</td>
<td>40%</td>
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The mid-term (2 hours) and final exam (3 hours) will consist of short answer essay questions developed from lectures, assigned readings and other presented material. There will be a few practice exam questions provided before the midterm and final exams. In addition, Assignments 1 and 2 are designed to help prepare you for the midterm and final exams. The final exam (3 h) will consider experimental ideas/approaches presented throughout the course, with the content focus being on the second half of the course.
6. **Additional Information/Statements**

**Statement on Use of Electronic Devices**
Electronic devices will not be allowed during tests and examinations.

**Statement on Academic Offences**
Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes an Scholastic Offence, at the following website: [http://www.uwo.ca/univsec/handbook/](http://www.uwo.ca/univsec/handbook/)

All assigned written work required in the course may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com ([http://www.turnitin.com](http://www.turnitin.com)).

**Absence from course commitments**

**A. Absence for medical illness:**

Information about “Accommodation for Medical Illness – Undergraduates: POLICY ON ACCOMMODATION FOR MEDICAL ILLNESS - UNDERGRADUATE STUDENTS” can be found in the Academic Handbook at:
[http://www.uwo.ca/univsec/handbook/](http://www.uwo.ca/univsec/handbook/)

Students must familiarize themselves with the Policy on Accommodation for Medical Illness: [https://studentservices.uwo.ca/secure/index.cfm](https://studentservices.uwo.ca/secure/index.cfm)

**Statement from the Dean’s Office, Faculty of Science**

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to the Dean's office as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from the Dean's Office immediately. For further information please see: [http://www.uwo.ca/sci/counselling/policies_faq.html](http://www.uwo.ca/sci/counselling/policies_faq.html)

A student requiring academic accommodation due to illness, should use the Student Medical Certificate when visiting an off-campus medical facility or request a Record's Release Form (located in the Dean's Office) for visits to Student Health Services. The form can be found at: [http://www.shs.uwo.ca/student/shs.policies.html](http://www.shs.uwo.ca/student/shs.policies.html)
The Policy on Accommodation for Medical Illness is also available on the BMSUE secure site: www.uwo.ca/bmsc

Medical documentation for accommodation for medical illness of work worth less than 10% of the total course grade will be required. Such documentation must be submitted by the student directly to the appropriate Faculty Dean’s Office and not to the instructor. It will subsequently be the Dean’s Office that will determine if accommodation is warranted. The accommodation will be in the form of a make-up assignment, make-up quiz, or re-weighting.

B. Absence for non-medical reasons:

Appropriate documentation must be submitted by the student directly to the appropriate Faculty Dean’s Office and not to the instructor for non-medical absences from quizzes, assignments and the final exam is required. It will subsequently be the Dean’s Office that will determine if accommodation is warranted. The accommodation will be in the form of a make-up assignment, make-up quiz, make-up exam or re-weighting, which may involve written exams being replaced by oral exams.

C. Special Examinations

A Special Examination is any examination other than the regular examination, and it may be offered only with the permission of the Dean of the Faculty in which the student is registered, in consultation with the instructor and Department Chair. Permission to write a Special Examination may be given on the basis of compassionate or medical grounds with appropriate supporting documents.

A Special Examination must be written at the University or an Affiliated University College no later than 30 days after the end of the examination period involved. To accommodate unusual circumstances, a date later than this may be arranged at the time permission is first given by the Dean of the Faculty. The Dean will consult with the instructor and Department Chair and, if a later date is arranged, will communicate this to Registrarial Services. If a student fails to write a scheduled Special Examination, permission to write another Special Examination will be granted only with the permission of the Dean in exceptional circumstances and with appropriate supporting documents. In such a case, the date of this Special Examination normally will be the scheduled date for the final exam the next time the course is offered.
Support Services:

Registrarial Services: http://www.registrar.uwo.ca

Academic Counselling (Science and Basic Medical Sciences): http://www.uwo.ca/sci/counselling/index.html

USC Student Support Services: http://westernusc.ca/services/

Student Development Services: http://www.sds.uwo.ca

Student Health Services: http://www.shs.uwo.ca/

Students that are in emotion/mental distress should refer to Mental Health@Western http://www.uwo.ca/uwocom/mentalhealth/ for a complete list of option about how to obtain help.