Spring 2016 PHBM - 312

# Magnified Imaging II – Light Microscopy and Imaging

## TENTATIVE Course Calendar and Syllabus

*Week 1*

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|---|---|
| Jan 26 | Course Schedule and Syllabus<br>Snowflake photography |
| Jan 28 | Basic Sample preparation<br>LAB: Assn 1 - Making digital color photomicrographs |

*Week 2*

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|---|---|
| Feb 2 | Microscopes and more<br>Kohler illumination and brightfield illumination<br>Forming Quality OPTICAL IMAGES |
| Feb 4 | 8:00 Critique Project 1<br>Optics, objective differences, correction collars and other special objectives |

*Week 3*

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|---|---|
| Feb 9 | Zeiss Photomicroscopes and Imaging Software |
| Feb 11 | Digital Microscopy - 8:00<br>Booth A610<br>10:00 Critique Project 2 |

*Week 4*

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|---|---|
| Feb 16 | Field trip to Wards Natural Science Est.<br>5100 W Henrietta Rd<br>359-2505 |
| Feb 18 | Low Power methods & Oil Immersion Techniques |

*Week 5*

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| Feb 23 | Polarized Light & Geology, Birefringence and Data |

Feb 25 LAB
8:00 Critique

*Week 6*

March 1 Fluorescence Methods & Imaging

March 3 Open LAB
8:00 Critique

*Week 7*

March 8 Differential Interference Contrast Microscopy

March 10 Midterm exam
8:00 Critique

*Week 8*

March 15 Darkfield and Rheinberg

March 17 LAB
8:00 Critique

*Week 9*

March 29 Comparison microscopes - Stereo microscopy

March 31 LAB
8:00 Critique

*Week 10*

April 5 LAB - Phase Contrast demo

April 7 8:00 Confocal Lab
A334 Thomas Gosnell Hall
10:00 Critique

*Week 11*

April 12 11:00 Critique

April 14 LAB
11:00 Critique

*Week 12*

April 19 Live Materials

April 21 LAB
8:00 Critique

*Week 13*

April 26 Hoffman Modulation Contrast

April 28 8:00 Critique

*Week 14*

May 3 TBD

May 5 LAB
8:00 Critique

*Week 15*

May 10 Final Exam

May 12 LAB
8:00 Critique

Week 16

Final Project Presentations

Two Exams - 20% of grade
Self Directed Final project - 20% of grade
10 assignments 55% of grade
Attendance & Class participation 5%

# Assignments:

Required

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|---|---|
| Assignment | Optimized Digital brightfield photomicrographs<br>Aperture Series Comparison<br>Smartphone Photomicrographs |
| Assignment | Zeiss AxioScope or AxioImager Photomicrographs |
| Assignment | Self directed final project – weighted as 2X |

Produce 8 from the following:

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| Assignment | Low Power |
| Assignment | Oil Immersion |
| Assignment | Spherical Aberration & collar adjustments |
| Assignment | Polarized Light and Sample Preparation |
| Assignment | Reflected Light Techniques |
| Assignment | Contrast Producing Techniques<br>*Each technique represents one assignment:*<br>*phase, fluorescence, DIC, darkfield, Rheinberg, HMC* |
| Assignment | Video and Live Materials |
| Assignment | Open – propose own |
| Assignment | The Stereo microscope |
| Assignment | Forensic Microscopy |
| Assignment | Make your own Microscope |
| Assignment | Comparison Microscopy photomicrographs |

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|---|---|
| Assignment | 25 views |
| Assignment | Botany |
| Assignment | Entomology |
| Assignment | Snowflakes |
| Assignment | Time Lapse |
| Assignment | Liquids |
| Assignment | Printed Materials |