# Fish Culture (Biology/Water 386/586)

Fall 2019

**Required Texts**:
Tidwell, J.H. (ed.) 2012. Aquaculture Production Systems. Wiley-Blackwell Publ. [Available at Text-Rental]

**Instructor**: Dr. Chris Hartleb
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Office Hours: (or by appointment)
Wed 9 – 10 am & Friday 1 – 2 pm

**Lecture Outline:**

| Week of: | Lecture Topic | Chapter in Text | Lab Exercise |
|---|---|---|---|
| **Introduction** | | | |
| **9/4** | History, value & markets | 1, 2 | |
| **Water & Culture Methods** | | | |
| **9/11** | Water sources & quality | 3 | Pumps |
| **9/18** | Water quality & effluents | 3 | Aeration & water quality |
| **9/25** | Ponds | 10 | *Trip: Wild Rose Hatchery** |
| **10/2** | Flow-through (raceways) | 9 | Pond soil |
| **10/9** | Recirculating (recycle) | 11 | **Exam** |
| **Biology & Products** | | | |
| **10/16** | Aquaponics | 14 | *Guest lecture** |
| **10/23** | Cage, net pens & PAS | 6, 7, 13, 15 | *Trip: Trout Farm** |
| **10/30** | Spawning & reproduction | | Mechanical filtration |
| **11/6** | Nutrition & stocking | | Chemical filtration |
| **Business & Value** | | | |
| **11/13** | Harvest & transport | | **Exam** |
| **11/20** | Processing & products | | *Fish disease workshop* |
| **11/27** | Sustainability & conservation | *Thanksgiving* | *Economics: take home lab (issued 11/27)* |
| **12/4** | BMP, biosecurity & HACCP | | Student presentations |
| **12/11** | Economics | | |

**Learning Outcomes:**
Upon successful completion of this course you should be able to –

1. Recognize the multiple levels of complexity at which biological systems operate from organism to ecosystem and be able to explain the emergent properties and process characteristic of each level.
2. Demonstrate proficiency in the methods and philosophy of science, including articulation and application of the Scientific Method, collection and analysis of biological data and application of professional ethics.
3. Articulate the application of biological sciences to meet the needs of society, including basic research, stewardship of biodiversity, human health, and entrepreneurial innovation.

**Supplemental Readings:**

Required additional readings will be assigned throughout the semester. Notification of each reading will be announced in lecture as we cover the appropriate topic. Readings may supplement the lecture or laboratory topic. Articles will be available on the course Canvas site (as pdf documents). Material in the readings will be partially covered in class and will be fully covered on the exams. If you have questions about the material in the articles, ask questions in class.

**Grading:**

| | | |
|---|---|---|
| Three Exams | Exam 1 (in class (**October 11**), 100 pts) | 20% |
| | Exam 2 (in class (**November 15**), 100 pts) | 20% |
| | Exam 3 (Final exam (**December 18, 8:00 am**, 100 pts) | 20% |
| Lab Exercises | (7 @ 15 pts each) | 24% |
| Project | (1 @ 100 pts; Due **December 6**) | 8% |
| Field Trips | (2 @ 41.5 pts each) | 8% |
| Total | (300 pts for exams; 285 pts labs, project & field trips) | 100% |

**Discretionary points**: Points may be added or subtracted from your final course grade based on effort, improvement, participation, alacrity, and attitude.

**Grade Distribution (in %):**

| | | |
|---|---|---|
| A = 100-94 | B- = 83-80 | D+ = 69-67 |
| A- = 93-90 | C+ = 79-77 | D = 66-60 |
| B+ = 89-87 | C = 76-74 | F = <60 |
| B = 86-84 | C- = 73-70 | |

**Lab Exercises:**

You will be required to complete 7 lab exercises. Data collection will be accomplished in class; data analysis & summaries should be completed during and after class. Reports are due one week after the exercise. Credit can be earned with exercise accuracy, proper calculations, thorough analysis and explanations, and neatness.

**Project:**

Each student will be required to give a presentation on **December 6** showing and describing **three** slogans representing the Wisconsin Aquaculture/Aquaponics Industries. Details to follow.

**Field Trips:**

Two field trips to fish culture facilities will be scheduled during the semester. Handouts and on-site exercises will be distributed and graded based on the field trip. Dates listed in the course schedule may have to be adjusted based on the availability of the facility. Be prepared for any type of weather. ***The field trips will require extended lab time, so plan early***. The trips are **required**.

**Rules & Grades:**

**There are NO "make-ups" for lab exercises**. Lab exercises will be due one week from completion in class. Two points (-2) will be subtracted each day for late submissions.

Only university approved absences, accompanied by appropriate evidence (see undergraduate catalog), will be accepted if you miss the exams. A make-up exam must be taken within 3 class days of the actual exam date. Contact the instructor **before** the exam if there may be a problem. Exams will be returned one week after the exam date. Discussion regarding grades or grading practices will only be conducted during office hours or appointments; this ensures privacy and confidentiality.

**Academic Misconduct**: You are responsible for the honest completion and representation of your work and for the respect of others' academic endeavors. Any act of cheating, plagiarism, or academic misconduct is subject to the penalties outlined in UWS Chapter 14; http://www.uwsp.edu/admin/stuaffairs/rights/rightsCommBillRights.pdf

**Students with Special Needs**: First see Student Disability Services and complete the necessary paperwork. Then, contact me so that arrangements can be made to meet your needs.