APBI 490 UBC Vancouver/APBI 420 UBC Okanagan (Tentative Syllabus)

Field Study of Wine Grape Production

2016-17 Summer Term

Location: UBC Okanagan (Kelowna, BC)

9:00AM to 1PM (lectures and labs) or 8:00AM to 5:00PM (field trips), August 8 - 18, 2017

**Instructor:** Dr. Simone Diego Castellarin

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**Course Overview:**

Major viticultural issues related to grape and wine production, including: origin of the major wine grape varieties and rootstocks, morphological features of the grapevine, major training systems in the Okanagan Valley, berry composition in relation to wine quality, and the impact of *terroir* on grape and wine quality. Field trips and laboratory classes will provide hands on sessions on the topics described above.

**Learning Objectives:**

Upon completion of this course, students will be able to:

1. Outline the morphological and genetic differences among wild and domesticated grapevines, cultivars, clones, and rootstocks.
2. Describe the major morphological features of cultivated grapevines, identifying how the morphological traits affect the way grapevines are cultivated.
3. Predict how the vegetative and reproductive growth cycles are affected by changes in environment.
4. Evaluate how major aspects of grapevine physiology (water and nutrient uptake, carbon uptake and assimilation, portioning of assimilates) affect grapevine cultivation and fruit quality.
5. Critically evaluate the major determinants of yield formation and fruit quality in the vineyard.
6. Interpret how the biology that underlies fruit composition impacts grape and wine quality.

**Pre-requisites:**  Pre-requisites: BIOL 112, BIOL 121, and one 200 level BIOL course. Otherwise, please, contact the instructor.

**Required textbook:**  Required readings will include the course instructor’s lecture notes and selected scientific papers (both will be posted on Connect).

**Optional books:**

Keller M (2015) The Science of the Grapevines: Anatomy and Physiology, Second Edition. Elsevier Inc, Burlington, MA, USA.

**Evaluation Criteria and Grading:**

In-class assignments and quizzes 30%

Mini report 10%

Participation 10%

Midterm Exam 20%

Final Exam 30%

**TOTAL 100%**

Final grades will be based on the evaluations listed above and the final grade will be assigned according to the standardized grading system outlined in the UBC Vancouver Calendar.

**Details of Assignments:**

Mini Report: The instructor will select one specific topic for the students to explore. Students will work individually. Students will research the most relevant scientific publications on the topic using search engines (Web of Science, Google Scholar, PubMed), read the abstracts of the publications and select two of them. The students are expected to carefully read the two articles and to prepare a two-page report (Times New Roman font, 12pt, 2.54 cm margins, single spaced). The report should identify the objectives of the studies, describe and compare the methodologies adopted to carry out the experiments, present and compare the results reported in the two articles. The second page should present a list of the most relevant publications on the topic (put an asterisk in front of the two articles that are discussed in the report). The report should be sent via email to the Instructor before the due date.

Midterm Exam and Final Exam: Exams are closed book and based on material from assigned readings and from in-class activities. The exams will include a combination of multiple choice and short-answer questions. The final exam will be comprehensive, covering material presented throughout the term. However, topics explored after the midterm exam will be emphasized.

Participation: Class participation will be assessed using responses to questions. Points will be assigned for simply responding to questions.

**Outline:**

The following table provides a tentative schedule for the term and may be adjusted.

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| --- | --- | --- |
| **Day #** | **Activity** | **Topic** |
| 1  8/8  9-1pm | Lecture | Botanical classification and geographical distribution of the grapevine. Domesticated and wild grapevines. Genetic origin of rootstocks, cultivars and clones. Where and how the major cultivars were selected. |
| 2  8/9  9-1pm | Lecture & Laboratory | Morphological structures of the grapevine (roots, trunk, branches, shoots, leaf, tendril, buds, flower, bunch, and berry). Sectioning and microscopy analyses of canes, shoots, buds. |
| 3  8/10  9-1pm | Lecture & Laboratory | Grapevine vegetative cycle. Major phenological stages and climate requirements for vegetative growth. Grapevine reproductive cycle. Major phenological stages and climate requirements for reproductive growth. |
| 4  8/11  8-2pm | Field Trip | Field trip to local vineyards: Training systems and vineyard design. (Location: Sebastian Farms, Oliver) |
| 5  8/14  9-1pm | Lecture | Grapevine yield determination. The biology that underlies yield formation in grapevine. Yield potential and its realization in the vineyard. The canopy: structure, photosynthesis, source-sink relationships. |
| 6  8/15  9-1pm | Exam & Guest Lecture | Midterm exam due and field trip with winery tour. (Location: Cedar Creek Estate Winery, Kelowna) |
| 7  8/16  9-1pm | Lecture & Laboratory | Berry composition. Description of the major metabolic pathways that determine fruit quality in grapevine. Analysis of the molecular pathways that control phenolic and aroma accumulation in these crops. Sugar, acid, anthocyanin analyses in grapes. |
| 8  8/17  9-1pm | Lecture | Environmental cues and grape and berry crop production. |
| 9  8/17  8-5pm | Field Trip | Field trip to vineyards. Irrigation, canopy management, and crop size adjustment strategies. (Location: Sandhill Vineyards & Constellation Brand Vineyards, Oliver) |
| 10  8/18  9-1pm | Laboratory & Guest Lecture | Group work on the data collected in the vineyard and final. Seminar from an industry member (Howard Soon, Head Winemaker at Andrew Peller Ltd). |

**Transportation fee:**

A student fee will be charged in addition to tuition to cover the cost of transportation to vineyard sites. The $75 additional fee covers the cost for group transportation for two field trips to vineyards. One field site is in Kelowna, and the second is in Oliver.

**Trip Plan Overview**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Date and time** | **Locations** | **N. Students** | **N. Supervisors/TAs** | **Farm host** |
| 8/11/2017  8am-2pm | UBCO - Oliver  (Sebastian Farms - Sibco Landfill Rd, Oliver, BC V0H 1T0) -UBCO | 35 | 1/2 | Devin Metven (Mission Hill Winery) |
| 8/15/2017  9-1pm | UBCO – Kelowna (CEDARCREEK ESTATE WINERY, 5445 Lakeshore Road, Kelowna, British Columbia, Canada V1W 4S5) - UBCO | 35 | 1/2 | Taylor Whelan (Cedar Creek Winery) |
| 8/17/2017  8-5pm | UBCO – Oliver (Until 12.30 Sandhill Vineyards, 300 Covert Pl, Oliver, BC V0H 1T5 / @ 12.30 Move to Constellation Brands Vineyards, Nk’Mip Rd, Oliver, BC) - UBCO | 35 | 1/2 | Steve McDonald (Sandhill Winery) and Ruiping Cheng (Constellation Brands) |

**Accommodations in Okanagan:**

Accommodations at the UBC Okanagan campus have been blocked for UBC Vancouver students.

Please, see the attached pdf describing the available room types within the block, the link for students to make their own reservations, and contact information.

**Students who have registered in the course at UBC Vancouver campus are encouraged to book their accommodation as soon as possible.**

Students can adjust the start and end dates of their stay at the link below.

Link for accommodation: <https://reserve.ubcconferences.com/okanagan/availability.asp?startDate=08/07/2017&endDate=08/19/2017&requesttype=invBlockCode&code=OBFC0817>