SOCR 301
Seed Germination and Viability

Course Syllabus

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SOCR 301, Seed Germination and Viability is a 2 credit course of undergraduate credit in Soil and Crop Science. This course allows the student to learn germination and tetrazolium testing through self-paced studying. The Seed Germination and Viability course was designed to fulfill the educational requirements to pass either the Registered Seed Technologist or Certified Seed Analyst examinations.

Six written lessons and accompanying reading assignments have been arranged in a progressive manner to guide you along through the determination of germination and testing the viability of ungerminated seed in the course of testing a seed lot. At the end of some lessons is an assignment that will allow you to put into practice the material which has been discussed in the lesson. These assignments are not required but are for additional consideration for the student who wishes to gain more insight into the information set forth in the lesson.

You may complete the practical assignment and answer the questions that go with it. These questions can be sent to the instructor for comments. The practical assignment is not required for each lesson and will not enter into the grading for the lesson. These are for further insight into the concepts put forth in the lesson.

The greatest advantage of an online course is that it is self-paced. Set yourself an even pace over the time that you will be working on the course. Allow plenty of time to review and understand the subject matter. Most of germination and viability testing comes from continually planting and evaluating seed tests and performing seed tests on a variety of species as is done in a seed laboratory. This course does not supplant the practical experience born out of daily testing over a period of years. I suggest that if you do not work in a seed laboratory you should obtain as many seed species as you can and try to germinate them, noting what normal and abnormal seedlings for each species appear like. In this way, the background information that this course supplies comes to life through practice. In addition, if you have a garden, I highly suggest that you also grow as many species as you can in the garden and compare the germination under natural conditions with those on artificial media. Observe the growth habits, flowering, and seed set of these species. This will aid in an understanding of the germination test in a more practical means than can be set down in a course such as this.
**Prerequisites:**

A firm knowledge of seed and seedling structure and an understanding of the physiology of seed germination and dormancy are prerequisites for the *Seed Germination and Viability* course. *SOCR 201, Seed Development and Metabolism* was designed to fulfill this requirement and be the prerequisite for the *Seed Germination and Viability* course.

**General Objectives:**

1. The student will review the physiology and anatomy of the seed and seed germination. The practical aspects of seedling anatomy and seed physiology will be discussed in relation to the germination test.

2. The student will gain an understanding of the AOSA definitions for germination and the source of seed utilized for the germination test and the proper number of seeds planted for the test to become official by AOSA standards.

3. The student will gain a working knowledge of the AOSA: Rules for Seed Testing. The germination tables will be stressed.

4. The student will demonstrate the proper use of the AOSA germination tables by showing the proper substrata, temperature, moisture, and light requirements for a number of agricultural species.

5. The student will demonstrate a practical knowledge of the parameters of the germination test by exhibiting a knowledge of the duration of the test, proper aeration techniques for moistening the media, and the special germination procedures as outlined in the Rules for Seed Testing.

6. The student will gain a practical knowledge of alternate methods for testing seed species, when to retest, and how to record the results of the germination test.

7. The student will discuss the nature of dormancy and demonstrate a knowledge of seed dormancy by using various accepted methods for breaking dormancy in the germination test.

8. The student will be introduced to the evaluation of the seedlings found in the germination test. A working knowledge of normal seedlings vs. abnormal seedlings will be demonstrated. The causes of abnormalities will be discussed.

9. The tetrazolium test will be studied. How to perform the TZ test and the subsequent evaluation of the TZ test will be demonstrated by the student.

10. Utilization of paired tests and their importance to viability testing will also be examined.
Texts:

Required Reading:

The following texts may be obtained directly from AOSA. Please contact AOSA’s executive assistant, Anita Hall, to order the materials. Identify yourself as a student to receive a discounted price. 607-256-3313, http://www.aosaseed.com

- Seed Technology Training Manual, Society of Commercial Seed Technologists, McDonald, Gutormson, Turnipseed editors.

This text may be purchased from the CSU Bookstore, or an online venue:

- Principles of Seed Science and Technology, L.O. Copeland and M.B. McDonald.

Additional Reading (not required)

SEEDS: Physiology of Development and Germination, J.D. Bewley and M. Black.
Seeds: Ecology, Biogeography, and Evolution of Dormancy and Germination, Carol C. and Jerry M. Baskin
Viability of Seeds, E.H. Roberts
Basic and Applied Aspects of Seed Biology, Ellis, Black, Murdoch, and Hong Editors.

Exams and Grading:

Upon completion of each lesson the student will be administered a multiple choice/short answer examination. They are closed book exams. The examination for each lesson must be proctored. **If you are taking this course on the CSU campus, please contact the instructor to arrange a time to take the exam.**

Your final grade will be based upon the following point scale:

| 6 lesson tests | 50 pts ea. | 300 pts |

A proctor is someone who ensures academic integrity by administering your exams. The student is responsible for designating a proctor to oversee each examination. Once a proctor has been identified, the instructor will email the proctor a password that they can use to access the exam online. They will then oversee the student taking the exam to make sure that no outside sources are used.
If you are off campus, please fill out the proctor agreement form, found on RamCT under “Course Content.” You will not be able to take exams without a proctor agreement form on file.

Colorado State reserves the right to verify a proctor’s identity, require additional proof of eligibility, or require the selection of a different proctor. The proctor agreement may be terminated at will by the proctor, student, or Colorado State by providing written notification to all parties involved.

Proctors can be:

- college or university testing center representatives,
- military educators,
- pastors or ministers,
- continuing education officers,
- librarians,
- certified school teachers,
- school principals, or
- supervisors.

Proctors cannot be:

- fellow students,
- subordinates of the student,
- coworkers, peers, friends, or
- related to the student in any way.