

Experimental design (2nd Year of study, 4th Semester)

Credit value (ECTS) 4

Course category

Domain (Imposed)

Course holder:

Assoc. Prof. Denis TOPA, Ph.D.

Discipline objectives (course and practical works)

The Experimental design course in accordance with analytical program has aims knowledge of general measures for the execution of experiences and way of execution of field experiments and vegetation house and calculation and interpretation of the experimental results.

Practical works seek to familiarize students with fundamental elements of the experiments and statistical interpretation of experimental data with computers programs.

Contents (syllabus)

Course (chapters/subchapters)
General consideration: 1.1. The history of experimental methods; 1.2. The importance of experimental design; 1.3. The classification of the experiments; 1.4. Conditions that influence the success of the experiments; 1.5. Terminology;
Fundamental elements of the experiments: 2.1. Experimental plot, 2.1.1. Form of plots; 2.1.2. Size of plots; 2.2. Experimental factors and the negative influences, 2.2.1. Margin effect; 2.2.2. Effect of neighbors; 2.2.3. Effect of blanks; 2.3. Number of replications; 2.4. Form of the block. 2.5. Distribution of treatments; 2.6. Control; 2.7. Duration of the experiments.
General consideration regarding the execution of field experiments: 3.1. Design, organization, and execution of field experiences; 3.2. Experimental equipment; 3.3. Design of experimental fields; 3.4. The uniformization of soil in experimental fields; 3.5. Crop rotation in experimental fields; 3.6. Soil tillage in experimental fields; 3.7. Utilization of labels in the experimental fields; 3.8. Fertilization in the experimental fields; 3.9. Sowing in the experimental fields; 3.10. Crop protection in experimental fields; 3.11. Observation in experimental fields. 3.12. General observations in different growing stages of crops; 3.13. The harvesting in experimental fields; 3.14. Samples collections; 3.15. The correction of differences in moisture.
Field experience with different crops: 4.1. General consideration; 4.2. Field experience with grain; 4.3. Field experience with corn; 4.4. Field experience with grain legumes; 4.5 Field experience with sunflowers; 4.6. Field experience with potatoes; 4.7. Field experience with sugar beet; 4.8. Field experience with linseed; 4.9. Field experience with forage plants
Field experience with chemical treatments and tillage systems: 5.1. Field experience with fertilizer; 5.2. Field experience with tillage systems; 5.3. Field experience with chemical treatments.
Calculation and interpretation of the experimental results

Practical works
Terminology. Methods of lay - out. Fundamental elements of the experiments.
Calculation and interpretation of experiment with systematical distribution of the treatments.
Calculation and interpretation of experiment with randomized distribution of the treatments
Randomized blocks methods
Latin square Latin rectangle
The variants of the split-plot design
Calculation and interpretation of groups of experiments
Calculation and interpretation of incomplete experiments
Analysis of correlation
Analysis of regressions
Analysis of covariance

Bibliography

1. Clewee A.G., Scarisbrick, D.H., 2001 – *Practical Statistics and Experimental Design for Plant and Crop Science*.
2. Mead R., Curnow R.N., Hasted A.M., 1993, *Statistical Methods in Agriculture and Experimental Biology*, 2nd edition.
3. Gerard Jităreanu, 2000 - *Tehnică experimentală*. Editura I. I. de la Brad, Iași.
4. Teodor Onisie, Gerard Jităreanu, 1992 - *Lucrări practice de tehnică experimentală*, UAMV Iași.
5. Ceapoiu N., 1968 - *Metode statistice aplicate în experiențele agricole și biologice*. Editura Agro-Silvică, București.

Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Exam	Written test	60%
Appreciation of the activity during the semester	Oral assessment during the semester, verification tests and final laboratory colloquium.	40%

Contact

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