

## Basic Information

**Course Code****Course Title** Weed ecology and control**Academic Year** 2022/2023**Academic Program** New Professional Diploma in Plant Clinic and Phytosanitary Technologies**Hours/week** Lectures: 1 Practical: 1 total: 2**semester** 2nd

## 1. Course Aims

Weed ecology and control aims to familiarize students with fundamental aspects of weed biology and ecology that affect population community dynamics. It looks at chemicals and equipment as well as cultural, mechanical, and biological control methods used in managing weeds on cultivated land.

## 2. Intended Learning Outcomes

### 2.1. Knowledge and Understanding

On successful completion of this course, the student should be able to

2.1.1- Know the different kind of weed and their negative effect on agriculture.

2.1.2- Understand the competition action between the plant and weeds.

2.1.3- Know how weed reproduce and effect of climate on reproduction process.

2.1.4- Recognize the different control methods for weed.

2.1.5- Be familiar with weed management.

### 2.2. Intellectual Skills

By the end of this course, the student should be able to

2.2.1- Distinguish among different kind of weeds.

2.2.2- Professionally interprets the competition process.

2.2.3- Explain the impact of climate change on weed reproduction and spore dispersal.

2.2.4- Recommend the appropriate method for controlling the appropriate weed.

### 2.3. Practical and Professional Skills

By the end of this course, the student should be able to

2.3.1- Use different methods for weed control.

2.3.2- Estimates the best method for soil sterilization.

2.3.3- Use different herbicide sprayer concentration for weed control

### 2.4. General and Transferable Skills

By the end of this course, the student should be able to

2.4.1- Think independently, set tasks and solve problems on scientific basis.

2.4.2- Communicate with colleagues and works in a research team

2.4.3- Acquire self and continuous capabilities to develop his professional skills

## Course content

Topics	Total (hr)	Lectures (hr)	Practical (hr)
Introduction and overview on weed identification and the agricultural losses caused by the weeds.	2	1	1
Weed classification Annual Weeds: Dormancy, Germination and Establishment.	2	1	1
Biennial and Perennial Weeds.	2	1	1
Weed ecology (Invasion Ecology).	2	1	1
Factors for which weed and crop plants compete and characteristics that make weeds successful.	2	1	1
<b>Weed</b> reproduction and seed dispersal.	2	1	1
Weeds and climate change.	2	1	1
Cultural weed control (Prevention, crop rotation and tillage).	2	1	1
Mechanical weed control (Hand pulling, hoeing, intertillage, mowing, flaming and burning and flooding).	2	1	1
Chemical weed control (Chemical activity, time and method of application, soil sterilization).	2	1	1
Herbicide labels and sprayer calibration.	2		1
Biological control (Allelopathy, insects, pathogens and vertebrates).	2	1	1
Weed management vs. control.	2	1	1
Weed Science and the Future -Special problems of weeds and irrigation.	2	1	1
<b>Total</b>	<b>28</b>	<b>14</b>	<b>14</b>

### Course Matrix for Achievement of Intended Learning Outcomes

	Topics	Hours	K & U					IS				P & PS			G & TS				
			1	2	3	4	5	1	2	3	4	1	2	3	1	2	3		
1	Introduction and overview on weed identification and the agricultural losses caused by the weeds.	2	x					x									x		
2	Weed classification Annual Weeds: Dormancy, Germination and Establishment.	2	x					x									x		
3	Biennial and Perennial Weeds.	2	x					x									x		
4	Weed ecology (Invasion Ecology).	2		x					x								x	x	
5	Factors for which weed and crop plants compete and	2		x					x								x	x	

	characteristics that make weeds successful.																		
6	<b>Weed</b> reproduction and seed dispersal.	2			x					x							x	x	
7	Weeds and climate change.	2			x					x							x	x	
8	Cultural weed control (Prevention, crop rotation and tillage).	2				x					x	x						x	
9	Mechanical weed control (Hand pulling, hoeing, intertillage, mowing, flaming and burning and flooding).	2				x					x	x						x	
10	Chemical weed control (Chemical activity, time and method of application, soil sterilization).	2				x					x	x	x				x	x	x
11	Herbicide labels and sprayer calibration.	2				x					x						x		x
12	Biological control (Allelopathy, insects, pathogens and vertebrates).	2				x					x	x						x	
13	Weed management vs. control.	2					x											x	x
14	Weed Science and the Future-Special problems of weeds and irrigation.	2					x											x	x

#### 4. Teaching and Learning Methods

- Lectures: Interactive lectures through:
- Teaching lectures to gain knowledge and understanding skills
  - Seminars
  - Group discussions
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- Practical sessions:
- Laboratory lessons (Practical sessions) to gain practical skills
  - Field visits
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- Self-Learning activities:
- Assays and reporting in different topics
  - Analyze the results and reach specific conclusion

#### 5. Teaching and Learning Methods for Students of Limited Capabilities

	<b>6. Student Assessment</b>
<b>6.1. Methods</b>	<b>Intended Learning Outcomes Covered</b>

	KU	IS	PPS	GTS
Written exams	2.1.1, 2.1.2, 2.1.3,2.1.4, 2.1.5	2.2.1, 2.2.3		
Practical exams			2.3.1, 2.3.2, 2.3.3	
Oral exams		2.2.1, 2.2.2, 2.2.3, 2.2.4		2.4.1
Student activities				2.4.2, 2.4.3

## 6.2. Exam Description

Written exams	<ul style="list-style-type: none"> <li>• Short essays</li> <li>• Multiple choice questions</li> <li>• Comparisons</li> <li>• Giving the scientific term/information</li> <li>• Reasons for what comes</li> </ul>
Practical exams	<ul style="list-style-type: none"> <li>• Slideshow exams</li> <li>• Practical case studies</li> <li>• Exams on plants of the faculty farm</li> </ul>
Oral exams	<ul style="list-style-type: none"> <li>• The exam committee involves at least 3 examiners</li> <li>• Each evaluates the student by giving a separate score</li> <li>• The scores are then averaged</li> <li>• The student randomly selects question cards</li> </ul>
Student activities	<ul style="list-style-type: none"> <li>• Self-learning activities are evaluated throughout the semester</li> </ul>

### 6.3. Assessment Schedule

### 6.4. Weighing of Assessments

Exams and activities		Total (%)
Semester work exam	4 <sup>th</sup> , 8 <sup>th</sup> and 12 <sup>th</sup>	10
Student activities	Throughout the semester	10
Final written exam	16 <sup>th</sup>	50
Final Practical exam	15 <sup>th</sup>	20
Final oral exam	16 <sup>th</sup>	10
<b>Total</b>		100

## 7. List of References

### 7.1. Course Notes

Course notes will be given at the beginning of each lecture

### 7.2. Essential Books

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- Zimdahl, Robert L. (2013) Fundamentals of Weed Science. Academic Press
  - Hynes, Erin (1995) Controlling Weeds. Emmaus, Pennsylvania: Rodale Press. pp. 26–30.
  - Baskin and Baskin (2006) The natural history of soil seed banks of arable land.
  - Peters et al. (2014) Impact of climate change on weeds in agriculture: a review.
  - Gallandt et al., (2017) Developments in physical weed control.
  - Duke (2012) Why have no new herbicide modes of action appeared in recent years?
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### **7.3. Recommended Books**

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- Gallandt et al., (2017) Developments in physical weed control.
  - Cripps et al. (2011) Classical biological control of *Cirsium arvense*: Lessons from the past.
  - Zimdahl (1999) Chapter 17. Herbicides and the environment
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### **7.4. Periodicals, websites, ..... etc.**

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Weed Research  
Agronomy

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**Course coordinator:**

Prof. Dr.

**Head of Department:**

Prof. Dr.