# Module (Course Syllabus) Catalogue

# 2025-2026

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| **College/ Institute** | **Khabat Technical Institute** | |
| **Department** | **Hydroponic Technique** | |
| **Module Name** | **Greenhouse Designs** | |
| **Module Code** | **GRD204** | |
| **Degree** | **Technical Diploma** ■ **Bachler** ☐<br>**High Diploma** ☐ **Master** ☐ **PhD** ☐ | |
| **Semester** | **Second** | |
| **Qualification** | **MSc. Field Crops Production** | |
| **Scientific Title** | **Assist. Prof.** | |
| **ECTS (Credits)** | **7** | |
| **Module type** | **Prerequisite** ☐ **Core** ☐ **Assist.** ☐ | |
| **Weekly hours** | | |
| **Weekly hours (Theory)** | **( 2 )hr Class** | **( 6 )Total hrs Workload** |
| **Weekly hours (Practical)** | **( 3 )hr Class** | **( 9 )Total hrs Workload** |
| **Number of Weeks** | | |
| **Lecturer (Theory)** | **Bilal Ibrahim Muhammed** | |
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| **Lecturer (Practical)** | **Bilal Ibrahim Muhammed**<br>**Zhyan Hamed Ahmed** | |
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| **Websites** | | |

# Course Book

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| **Course Description** | This course introduces students to the principles and practices of greenhouse production. It focuses on the design, construction, and management of greenhouses for growing plants under controlled environmental conditions. Students will learn how factors such as temperature, light, humidity, irrigation, and nutrition affect plant growth. The course also covers greenhouse crops, pest and disease control, and the use of modern technologies to improve productivity and sustainability. |
| **Course objectives** | By the end of this course, students will be able to:<br>• Understand the purpose and types of greenhouses.<br>• Explain the environmental factors affecting plant growth in greenhouses.<br>• Apply basic greenhouse management practices.<br>• Identify common greenhouse crops and their requirements.<br>• Recognize common pests and diseases and methods of control.<br>• Use greenhouse technology efficiently to improve crop yield and quality. |
| **Student's obligation** | Students are expected to:<br>• Attend lectures and practical sessions regularly.<br>• Participate actively in class discussions and greenhouse activities.<br>• Complete assignments, reports, and practical tasks on time.<br>• Follow safety rules and proper behavior inside the greenhouse.<br>• Prepare for quizzes, exams, and practical evaluations. |
| **Required Learning Materials** | • **Lecture notes and handouts** provided by the instructor.<br>• **Practical tools and safety equipment** for greenhouse work (as required).<br>• **Supplementary resources:** Scientific articles, videos, and online materials related to greenhouse production. |

| | | | Weight (Marks) | Due Week | Relevant Learning Outcome |
|---|---|---|---|---|---|
| **Evaluation** | Task | | | | |
| | Paper Review | | | | |
| | Assignments | Homework | 5 | 4 | |
| | | Class Activity | 2 | 12 | |
| | | Report | 10 | 2 | |
| | | Seminar | | 2 | |
| | | Essay | | | |
| | | Project | | | |
| | Quiz | | 8 | 6 | |
| | Lab. | | 10 | 2 | |
| | Midterm Exam | | 25 | 1 | |
| | Final Exam | | 40 | 1 | |
| | Total | | 100 | | |

**Specific learning outcome:**

1- Identify and compare different types of greenhouses and covering materials.
2- Explain how environmental factors (temperature, light, humidity, and $CO_2$) influence plant growth.
3- Demonstrate safe working practices inside the greenhouse.
4- Evaluate greenhouse management practices to improve productivity and sustainability.

**Course References:**


1- Bhat, S. A., Amin, T., Bashir, O., & Khan, S. A. (Eds.). (2025). Greenhouse Technology for Sustainable Agriculture. CRC Press.
2- Salokhe, V. M., & Sharma, A. K. (2006). Greenhouse technology and applications (pp. 280).
3- Castilla, N. (2013). Greenhouse technology and management. Cabi.
4- Singh, K. A. P., Goutam, P. K., Xaxa, S., Nasima, S. P., Panotra, N., & Rajesh, G. (2024). The role of greenhouse technology in streamlining crop production. Journal of Experimental Agriculture International, 46(6), 776-798.
5- Wahid, A., Patel, A., Challa, P., Selvan, S. S., Kumar, V., Bhat, S. A., ... & Malik, T. (2025). Greenhouse Technology and Agricultural Engineering. In Greenhouse Technology for Sustainable Agriculture (pp. 173-206). Apple Academic Press.

| Course topics (Theory) | Week | Learning Outcome |
|---|---|---|
| Define, historical and introduction of greenhouse | 1 | |
| **Wooden houses**: Definition, structural organization Criteria for choosing the type | 2 | |
| Ventilation, temperature control, orientation and location | 3 | |
| **Plastic greenhouses:** Definition, structural organization | 4 | |
| Criteria for choosing the type and location | 5 | |
| Ventilation, temperature control and orientation | 6 | |
| **Glass greenhouses:** Definition, structural organization | 7 | |
| Criteria for choosing the type and location | 8 | |
| Ventilation, temperature control and orientation | 9 | |
| **Multi-span houses:** Definition, structural organization | 10 | |
| Criteria for choosing the type and location | 11 | |
| Ventilation, temperature control and orientation | 12 | |

| Practical Topics | Week | Learning Outcome |
|---|---|---|
| **Wooden houses:** Define and Inside house tools. | 1 | |
| Describe characteristics of successful installation wooden houses | 2 | |
| Plants grown in wooden houses | 3 | |
| **Plastic greenhouses:** Define and inside house tools. | 4 | |
| Describe characteristics of successful installation plastic greenhouses | 5 | |
| Plants grown in plastic greenhouse | 6 | |

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|---|---|---|
| **Glass greenhouses:** Define and inside house tools. | 7 | |
| Describe characteristics of successful installation glass greenhouses | 8 | |
| Plants grown in glass greenhouse | 9 | |
| **Multi-span houses:** Define and inside house tools. | 10 | |
| Describe characteristics of successful installation multi-span houses | 11 | |
| Plants grown in multi-span houses | 12 | |

**Greenhouse – Questions and Answers**

Q1: What is a greenhouse?

Answer:

A greenhouse is a structure covered with transparent materials such as glass or plastic that allows sunlight to enter and traps heat inside, creating a controlled environment for plant growth.

Q2: Why are greenhouses important in agriculture?

Answer:

Greenhouses allow crops to be grown all year round, protect plants from extreme weather, improve crop quality and yield, and enable better control of pests, diseases, and environmental conditions.

Q3: 8. What irrigation system is commonly used in greenhouses and why?

Answer:

Drip irrigation is commonly used because it saves water, provides precise moisture to plants, and reduces disease caused by excess water.

Q4: Greenhouse – Multiple Choice Questions (MCQs)

1. The main purpose of a greenhouse is to:

A. Increase soil erosion
B. Protect plants and control the environment
C. Reduce sunlight
D. Store harvested crops

2. Which material is most commonly used to cover greenhouses?

A. Wood
B. Concrete
C. Glass or plastic
D. Metal sheets

3. Which factor is not usually controlled in a greenhouse?

A. Temperature
B. Light
C. Rainfall
D. Humidity

4. Which system is used to reduce high temperature inside a greenhouse?

A. Heating system
B. Ventilation system
C. Fertilization system
D. Harvesting system

5. Drip irrigation is preferred in greenhouses because it:

A. Uses more water
B. Increases weed growth
C. Saves water and reduces disease
D. Floods the soil

**Extra notes:**

**External Evaluator**