

Resolution Number : AC/II(20-21).2.RUV1

**S. P. Mandali's**

**Ramnarain Ruia Autonomous College**

*(Affiliated to University of Mumbai)*



**Syllabus for**

**Program: BVoc, Green House Management**

**Program Code:RUVGHM**

(Credit Based Semester and Grading System for academic year 2020–2021)

## PROGRAM OUTCOMES

**A student completing bachelor's degree in a Vocational program will be able to :**

PO	PO Description
<b>PO 1</b>	Recall the knowledge and skills acquired in the program related to the working of the industry for which the student has been trained and effectively apply the job skills to discharge the responsibilities of the job roles in the industry.
<b>PO 2</b>	Listen and effectively communicate with peers, seniors and regulators of the industry within the corporate and official settings by rationally handling digital platforms used for information gathering, storing and dissemination and be competent to comprehend, evaluate and comply with the ethical and legal requirements while handling these platforms.
<b>PO 3</b>	Apply the knowledge and skills acquired by hands-on experiences to real-life situations and analyse objectively while making individual judgments to solve problems and troubleshoot with keen observation and hypothesis testing for independently reaching a logical conclusion.
<b>PO 4</b>	Analyse the information independently and transform it into knowledge as applicable to the contemporary situations of the trade and work cooperatively with peers and manage resources effectively while keeping the team goals over personal goals.
<b>PO 5</b>	Interact with people of diverse backgrounds and cultures respecting their beliefs and practices and while effectively engaging within a multicultural society and be able to empathise with the societal needs and be concerned and responsible to environmental issues.
<b>PO 6</b>	Perform duties ethically and comply with the legal and contemporary regulatory norms related to all areas of the trade with truthful representation of data and results.
<b>PO 7</b>	Responsibly take up initiatives and perform as an effective leader while executing different tasks as a team and evolve as a successful entrepreneur with abilities to motivate and organize people and effectively lead them in the right direction to achieve organizational goals.
<b>PO 8</b>	Take advantage of their prior learning and join the program during the course of their lifetime as a lifelong learner so as to reskill themselves and adapt to the changing demands of the trade at any point in life.

## PROGRAM SPECIFIC OUTCOMES

PSO	<b>PSO Description</b>  <b>A student completing Bachelor's Degree in Vocation program in the subject of Green House Management will be able to:</b>
PSO 1	This program will help the students to become entrepreneur/ self employed and give employments to others. This will also help students to enhance their employability for jobs in different sectors like nurseries, soilless farms, hydroponics farms, protected high tech farms, marketing of agri produce, supply chain management of agri produce, post - harvest technologies and value addition of products.
PSO 2	To train the learners in the different aspects of greenhouse development, cultivation and management as well as its implications.
PSO 3	To demonstrate an ability to engage in critical thinking by analyzing situations and constructing and selecting viable solutions to solve problems.
PSO 4	Ability to work effectively with others. To develop analytical ability and team work spirit necessary requirement of an entrepreneur
PSO 5	Recognize and examine the relationships between inputs and outputs in their farming/agricultural field to make effective and profitable decisions
PSO 6	Communicate effectively both verbally as well as non-verbally. Effective use of computers in communications.
PSO 7	Understand the correlation between all aspects of farming/cultivation/ agriculture and use it for innovations. Also understand how employer characteristics and decision-making at various levels enhance the success of an agricultural enterprise/marketing of agri products/ supply chains of agri products and accounting of the same.
PSO 8	Analyse the impact of the professional agricultural solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PSO 9	Demonstrate online research based knowledge of the legal and ethical environment impacting agriculture organizations and exhibit an understanding and appreciation of the ethical implications of decisions.
PSO 10	First- hand experience in the areas covered in the curriculum in the form of internships.

## PROGRAM OUTLINE

YEAR	SEM	COURSE CODE	COURSE TITLE	CREDITS
First / Diploma	I	<b>SKILL COMPONENT</b>		
		RUVGHM 101	Soil and Water Management - I	02
		RUVGHMP101	Practical I, Soil and Water Management - I	04
		RUVGHM 102	Integrated Nutrient Management - I	01
		RUVGHMP102	Practical II, Integrated Nutrient Management - I	03
		RUVGHM 103	Integrated Pest Management - I	01
		RUVGHMP103	Practical III, Integrated Pest Management - I	04
		RUVGHM 104	Introduction to Protected Cultivation -I	01
		RUVGHMP104	Practical IV, Introduction to Protected Cultivation -I	02
		<b>GENERAL EDUCATION COMPONENT</b>		
		RUVGHM 105	Communication Skills-I, ICT Skills -I & Business Skills -I	03
		RUVGHMP105	Practical V, Communication Skills-I, ICT Skills -I & Business Skills -I	05
		RUVGHM 106	Environmental Studies -I	03
		RUVGHMP106	Practical VI, Environmental Studies -I	01
	II	<b>SKILL COMPONENT</b>		
		RUVGHM 201	Protected Cultivation - I	03
		RUVGHMP 201	Practical I, Protected Cultivation - I	06
		RUVGHM 202	Harvesting - I	01
		RUVGHMP 202	Practical II, Harvesting - I	02
		<b>GENERAL EDUCATION COMPONENT</b>		
		RUVGHM 203	Communication Skills-II & ICT Skills -II	02

		RUVGHMP 203	Practical III, Communication Skills-II & ICT Skills -II	02
		RUVGHM 204	Business Skills -II	02
		RUVGHMP 204	Practical IV, Business Skills -II	02
		RUVGHMP 205 (SC)	Practical V, Internship	06
<b>Second / Advance Diploma</b>	<b>III</b>	<b>SKILL COMPONENT</b>		
		RUVGHM 301	Soil and Water Management – II	02
		RUVGHMP 301	Practical I, Soil and Water Management – II	04
		RUVGHM 302	Integrated Nutrient Management – II	01
		RUVGHMP 302	Practical II, Integrated Nutrient Management – II	03
		RUVGHM 303	Protected Cultivation – II	01
		RUVGHMP 303	Practical III, Protected Cultivation – II	04
		RUVGHM 304	Integrated Pest Management-II	01
		RUVGHMP 304	Practical IV, Integrated Pest Management-II	02
		<b>GENERAL EDUCATION COMPONENT</b>		
	RUVGHM 305	Communication Skills – III& ICT Skills - III	02	
	RUVGHMP 305	Practical V, Communication Skills – III& ICT Skills - III	04	
	RUVGHM 306	Business Skills –III& Managerial Skills - II	02	
	RUVGHMP 306	Practical VI, Business Skills –III& Managerial Skills - II	04	
	<b>IV</b>	<b>SKILL COMPONENT</b>		
		RUVGHM 401	Protected Cultivation – III	02
RUVGHMP 401		Practical I , Protected Cultivation – III	04	
RUVGHM 402		Harvesting - II	01	
RUVGHMP 402		Practical II, Harvesting - II	03	

		<b>GENERAL EDUCATION COMPONENT</b>			
		RUVGHM 403	Accounting- I	02	
		RUVGHMP 403	Practical III, Accounting- I	04	
		RUVGHM 404	Marketing – I& Supply Chain Management- I	04	
		RUVGHMP 404	Practical IV , Marketing – I& Supply Chain Management- I	02	
		RUVGHMP 405 (SC)	Practical V, Internship	08	
<b>Third / Bachelor in Vocation, Green House Management</b>	<b>V</b>	<b>SKILL COMPONENT</b>			
		RUVGHM 501	Soil and Water Management – III	02	
		RUVGHMP 501	Practical I, Soil and Water Management – III	04	
		RUVGHM 502	Integrated Nutrient Management – III	01	
		RUVGHMP 502	Practical II, Integrated Nutrient Management – III	03	
		RUVGHM 503	Protected Cultivation – IV	01	
		RUVGHMP 503	Practical III, Protected Cultivation – IV	03	
		RUVGHM 504	Post- Harvest Management and Value Addition	01	
	RUVGHMP 504	Practical IV, Post- Harvest Management and Value Addition	03		
		<b>GENERAL EDUCATION COMPONENT</b>			
		RUVGHM 505	Managerial Skills - III	02	
		RUVGHMP 505	Practical V , Managerial Skills - III	02	
		RUVGHM 506	Marketing – II & Supply Chain Management - II	04	
		RUVGHMP 506	Practical VI, Marketing – II & Supply Chain Management - II	04	
		<b>VI</b>	<b>SKILL COMPONENT</b>		
			RUVGHM 601	Protected Cultivation - V	02

	RUVGHMP 601	Practical I, Protected Cultivation - V	06
	<b>GENERAL EDUCATION COMPONENT</b>		
	RUVGHM 602	Accounting-II	03
	RUVGHMP 602	Practical II, Accounting-II	03
	RUVGHM 603	Marketing -III	03
	RUVGHMP 603	Practical III, Marketing -III	03
	RUVGHMP 604 (SC)	Practical IV, Internship	10
<b>Total Credits</b>	<b>18 (Skill component) + 12 (General Education Component) = 30 per Semester</b>		

Ramnarain Ruia Autonomous College

**SEMESTER I****Course Code: RUVGHM 101****Course Title : SOIL AND WATER MANAGEMENT – I****ACADEMIC YEAR 2020-21**

<b>COURSE OUTCOME</b>	<b>CO DESCRIPTION</b>
<b>CO 1</b>	Understand the methods of soil formation, layers of soil and their characteristics.
<b>CO 2</b>	Identify different type of soil and its geographical distribution.
<b>CO 3</b>	Acquire knowledge about the types of soil cultivation and their uses.
<b>CO 4</b>	Understand the various types of irrigation systems and the selection of appropriate irrigation system depending upon the crop.
<b>CO5</b>	Analyse the relation between water and soil properties.

**DETAILED SYLLABUS**

<b>Course Code/ Unit</b>	<b>Unit</b>	<b>Course/ Unit Title</b>	<b>Credits/ Lectures</b>
<b>RUVGHM101</b>	I	<b>Pedology</b> : Soil Genesis, Factors of soil formation, Soil profile and its development, Functions of Soil, Types of Soils of India.	2 credit, 15 Lectures
	II	<b>Soil Cultivation &amp; Water Management</b> : Implements required for soil cultivation. Types of soil cultivation. Soil Fertility- Types of soil organisms and their interaction. Water quality, different irrigation methods, selection of different irrigation methods depending upon crops and fertigation. The relation between water properties and water in filtration capacity of soil.	15 Lectures

**PRACTICALS**

<b>Code</b>	<b>Topics</b>	<b>Credits</b>
<b>RUVGHMP 101</b>	<b>SOIL AND WATER MANAGEMENT – I</b>	4
<b>1</b>	Identification of types of soil based on physical properties. ( Mechanical analysis of soil)	
<b>2</b>	Method of Collection soil sample for analysis from various fields / sources.	
<b>3</b>	Identification of different irrigation systems	
<b>4</b>	Components of drip irrigation system	
<b>5</b>	Components of sprinkler irrigation system	
<b>6</b>	Identification of different soil types of India using map.	
<b>7</b>	Health & Safety at the work place	



### REFERENCES

- 1 Pradeepkumar T, Suma B, Jyothibhaskar & Satheesan KN. 2007. *Management of Horticultural Crops*. Parts I, II by New India Publications.
- 2 Gopalswamylyengar. *Complete Gardening in India*
- 3 Biswas T D and Mukherjee S K .*Text Book of Soil Science* by, Tata McGraw-Hill Publishing Company Limited.
- 4 Prasad S and Kumar U 2003. Greenhouse management of horticultural crops. 2 Agrobios.
- 5 Principles of drip irrigation system, Dr. M.S. Mane, B.L.Ayare, Dr. S.S.Magar., New Delhi
- 6 Principles of sprinkler irrigation, Dr. M.S. Mane ,Dr.B.L. Ayare. Jain Bros., New Delhi
- 7 Tisdale and Nelson, book – soil fertility and fertilizers.
- 8 Eric lichtfouse-sustainable agriculture reviews-1-organic farming pest control and remediation of soil pollutants-springer publication-ebook

**Course Code: RUVGHM 102**

**Course Title : INTEGRATED NUTRIENT MANAGEMENT – I**

COURSE OUTCOME	CO DESCRIPTION
CO 1	Understand and recall the different components of nutrients required for healthy growth and development of plants.
CO 2	Identify and apply different fertilizers and manures as per the plant requirement.
CO 3	Prepare various types of inorganic and organic fertilizers.

### DETAILED SYLLABUS

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
RUVGHM102	I	<b>Plant nutrition</b> - Macro nutrients, Micro nutrients, Essential nutrient, Beneficial nutrient.	1 credit, 8 Lectures
	II	<b>Manures and Fertilizers-</b> Manures: Definition, importance, important manures FYM (compost), oil cakes, green manure, organic manures and vermicompost. Liquid fertilizer - Vermiwash, Beejamrit, Jeevamrit, Dhanajivamrit, Cow urine. Fertilizers: Definition, Types – Straight, Compound and mixed. Nitrogenous (NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> , Urea, Ca (NO <sub>3</sub> ) <sub>2</sub> , NH <sub>4</sub> Cl, Phosphatic Fertilizers	9 Lectures

### PRACTICALS

Code	Topics	Credits
RUVGHMP 102	<b>INTEGRATED NUTRIENT MANAGEMENT – I</b>	3
1	Test for fertilizers	

2	Test for manures	
3	Preparation of compost	
4	Preparation of vermicompost	
5	Identification of green manure	
6	Identification of biofertilizers – Poultry manure, Oilcakes, Horse manure, Cow manure, Farmyard manure.	
7	Comparative study of organic and inorganic nutrient provided plant growth	

### REFERENCES

- 1 Book by Thorne-Farm manure
- 2 Tisdale and Nelson, book – soil fertility and fertilizers.
- 3 Pradeepkumar T, Suma B, Jyothibhaskar & Satheesan KN. 2007. *Management of Horticultural Crops*. Parts I, II by New India Publications.
- 4 Gopalswamylyengar. *Complete Gardening in India*
- 5 Ramachandrappa and Nanjappa. *Fertigation Technology*, Agrobios, India
- 6 Prasad S and Kumar U. *Green House Management for Horticultural Crops*. Agrobios India
- 7 Eric lichtfouse-sustainable agriculture reviews-1-organic farming pest control and remediation of soil pollutants-springer publication-ebook

Course Code: RUVGHM 103

Course Title : INTEGRATED PEST MANAGEMENT – I

COURSE OUTCOME	CO DESCRIPTION
CO 1	Knowledge about the concept of plant pathology, plant pathogens.
CO 2	Classification and identification of pathogens, insects and pests.
CO 3	Understand the causes of pathogen, insect and pest attack
CO 4	Study the control measures against the said pathogens, insects and pests.

### DETAILED SYLLABUS

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
RUVGHM103	I	<b>Plant pathology</b> - Definition and Concept of plant pathology, Introduction and Importance of Plant Pathogens, Causes and Survival of plant pathogens. Classification of disease.	1 credit, 5 Lectures
	II	<b>Entomology</b> - Introduction and Importance of Insects, Classification of Insect pests, Non-insect pests, Dispersal and Movement of insects. Non-insect pest - Nematodes and their control. Diseases and pests attacking leafy vegetable crops and their control.	10 Lectures

### PRACTICALS

Code	Topics	Credits
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RUVGHMP 103	INTEGRATED PEST MANAGEMENT – I	4
1	Study of different types of greenhouses insect pest and non insect pest.	
2	Collection and identification of insect pests attacking greenhouse crops.	
3	Study of diseases infecting leafy vegetables and their control measures.	
4	Study of pests attacking leafy vegetables and their control measures.	
5	Study of pathogens of different hydroponic systems and their control measures.	
6	Health & Safety to be practiced to keep away pest and disease.	

### REFERENCES

- 1 Pradeepkumar T, Suma B, Jyothibhaskar & Satheesan KN. 2007. *Management of Horticultural Crops*. Parts I, II by New India Publications.
- 2 Dharma Abrol-Integrated Pest Management-1<sup>st</sup> Edition-By current concepts and ecological prospective.
- 3 Ram Singh & Vikas Jindal G.S. Dhaliwal-book- A Textbook of Integrated Pest Management Paperback – 1 January 2013
- 4 <https://agrimoon.com/wp-content/uploads/Insect-Ecology-Integrated-Pest-Management.pdf>

Course Code: RUVGHM 104

Course Title : INTRODUCTION TO PROTECTED CULTIVATION - I

COURSE OUTCOME	CO DESCRIPTION
CO 1	Understand and recall the concept of greenhouse, greenhouse cultivation and global scenario of protected cultivation.
CO 2	Identify the various components and types of greenhouses.
CO 3	Understand and study the economics of types of greenhouses and cultivation of crops therein.
CO 4	Identify different types of nurseries and nursery plants.
CO5	Perform all the types of natural plant propagation techniques.

### DETAILED SYLLABUS

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
RUVGHM104	I	<b>Basics of Greenhouse</b> - Concepts, principles and Importance. Green House World Scenario, Status in India, Study of the working of the various components of a greenhouse. Classification of greenhouse based on suitability and cost, as per structure, glazing, number of span, environmental control. Based on shape and utility, Based on Covering material, Cost and Location. Frame work for various types of green houses. Construction of floors and Layout. Planning and Designing- Site selection, Design according to the location, orientation, climate, load bearing capacity.	1 credit  10 lectures
	II	<b>Nursery development and management</b> Nursery and types of nurseries, nursery management, common nursery operations. Cultivation and propagation of potted plants, fruit/ flower/ vegetable/ medicinal plant/ succulents through conventional methods.	5 Lectures

### PRACTICALS

Code	Topics	Credits
RUVGHM P 104	<b>INTRODUCTION TO PROTECTED CULTIVATION - I</b>	2
1	Study of different types of greenhouses	
2	Study of components of greenhouse, core material and covering material their fabrication, erection and construction,	
3	Basic conversions from one unit to the other.	
4	Calculation of the number of plants to be accommodated in a given greenhouse.	
5	Estimation of construction cost for basic greenhouse model	
6	Estimation of operating costs and return from Greenhouse.	
7	Potting and repotting of plants	
8	Propagation of vegetables, flowering and fruiting crop through conventional methods – Seeds, bulbs, corm, runners and suckers.	

### REFERENCES

- 1 Ramachandrappa and Nanjappa. *Fertigation Technology*, Agrobios, India
- 2 Prasad S and Kumar U. *Green House Management for Horticultural Crops*. Agrobios India
- 3 Pant V, Nelson. 1991. *Green House Operation and Management*. Bali Publ.
- 4 UCSC Farm & Garden Apprenticeship- S Edited by Martha Brown, Jan Perez, and Albie Miles 3RD EDITION Revised & Expanded Teaching Organic Farming & Gardening
- 5 <https://casfs.ucsc.edu/about/publications/Teaching-Organic-Farming/PDF-downloads/TOFG-all.pdf>
- 6 Alex Lauric and Victor h Ries. *Floriculture, Fundamentals and Practices* .Agrobios, India
- 7 Ramachandrappa and Nanjappa. *Fertigation Technology*, Agrobios, India
- 8 Prasad S and Kumar U. *Green House Management for Horticultural Crops*. Agrobios India
- 9 Prasad S and Kumar U. *Principles of Horticulture* .Agrobios India.

10 <http://www.fao.org/3/a-i3284e.pdf>11 [http://agritech.tnau.ac.in/agricultural\\_engineering/greenhouse.pdf](http://agritech.tnau.ac.in/agricultural_engineering/greenhouse.pdf)12 <https://ag.umass.edu/sites/ag.umass.edu/files/book/pdf/greenhousebmpfb.pdf>**Course Code: RUVGHM 105****Course Title : COMMUNICATION SKILLS – I& ICT SKILLS – I AND BUSINESS SKILLS – I**

COURSE OUTCOME	CO DESCRIPTION
CO 1	Communicate verbally and non-verbally, Write formal as well as informal letters.
CO 2	Operate computers and work using Microsoft word.
CO 3	Knowledge about types of business organizations, merits and demerits.

**DETAILED SYLLABUS**

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
RUVGHM105	I	<b>Communication Skills – I - Basic Language Skills</b> Basic Grammar – Tenses, modal auxiliary, voice, speech and Usage, Writing of CV, Verbal Communication and Non-verbal communication. Barriers to communication. Letter writing – formal, informal.	3 credit, 15 Lectures
	II	<b>Unit II - ICT Skills – I- Basics of Computers &amp; Business Skills</b> Definition of Computer, Hardware Component, System Unit, able to switch on & off the computer. Working with MS. Word 365 for auto-generation of: Table of content, Bibliography, Citation (APA/MLA), Index, Translate between languages. Protecting IPR  Meaning of Business, Commerce and Industry–Business Organisation -Types of Business Organisation- Merits and demerits of Sole Trading Concern, Partnership and Joint Stock Companies. Business objectives, Classification of objectives.	30 Lectures

**PRACTICALS**

Code	Topics	Credits
RUVGHMP 105	<b>COMMUNICATION SKILLS – I&amp; ICT SKILLS – I AND BUSINESS SKILLS – I</b>	5
1	Basic Language – Worksheets.	
2	Resume writing	
3	Preparation for mock interview.	
4	Study of various components of computer	
5	Switching on and off Computers.	
6	Practical on business skill	
7	Organisational structure/ Chart in various types of business houses- Proprietary firm, partnership firm,, joint stock companies and corporation.	
8	Hierarchy chart and roles of each individual in a decentralised structure	

## REFERENCES

1. Book-How to talk to anyone by Leil Lowndes
2. Influencer: The new science of leading change by Joseph Grenny, Kerry Patterson, David Maxfield, Ron McMillan and Al Switzler
3. Talk like TED: The 9 public speaking secrets by Carmine Gallo
4. Crucial conversations by Joseph Grenny, Kerry Patterson, Ron McMillan and Al Switzler
5. <https://www.bankexamstoday.com/2019/04/letter-writing-format-types-and-sample.html>
6. <http://ncert.nic.in/textbook/pdf/kehb115.pdf>
7. Mukesh Sharma-Basic Computer Course: A Freshers Guide To Modern Day Computing
8. J. Clark Scott-But How Do It Know? - The Basic Principles of Computers for Everyone
9. [https://www.vfu.bg/en/e-Learning/Computer-Basics--computer\\_basics2.pdf](https://www.vfu.bg/en/e-Learning/Computer-Basics--computer_basics2.pdf)
10. [http://www.just.edu.jo/~mqais/CIS99/PDF/Ch.01\\_Introduction\\_%20to\\_computers.pdf](http://www.just.edu.jo/~mqais/CIS99/PDF/Ch.01_Introduction_%20to_computers.pdf)

**Course Code: RUVGHM 106**

**Course Title : ENVIRONMENTAL STUDIES – I**

COURSE OUTCOME	CO DESCRIPTION
<b>CO 1</b>	Understand the impact of various types of pollution in the environment and in farming.
<b>CO 2</b>	Knowledge about the Environmental Impact Assessment.
<b>CO 3</b>	Evaluate the causes of loss of biodiversity and study the modes of conservation of biodiversity
<b>CO4</b>	Understand the importance of sustainable agriculture concepts.
<b>CO5</b>	Implement different methods of urban agriculture.

### DETAILED SYLLABUS

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
<b>RUVGHM106</b>	I	<b>Ecological degradation-</b> Greenhouse gas emission, Deforestation, Air and Water pollution, Depletion and conservation of Biodiversity Environmental Impact Assessment	3 credit, 15 Lectures
	II	<b>Sustainability</b> Introduction & Principles of Sustainability, Sustainable agriculture (rural & urban).	30 Lectures

**PRACTICALS**

Code	Topics	Credits
<b>RUVGHMP 106</b>	<b>ENVIRONMENTAL STUDIES – I</b>	<b>1</b>
<b>1</b>	Determination of salinity of given water sample	
<b>2</b>	Determination of hardness of the given water sample	
<b>3</b>	Identification of the components of a vertical wall /garden	
<b>4</b>	Study of the components and the working of a biogas plant	

**REFERENCES**

1. Y.K.Singh-Environmental science
2. Fundamentals of Environmental Studies by Mahua Basu (Author), Xavier Savarimuthu SJ (Author)
3. Environment and Ecology ? A Complete Guide, Second Edition by R Rajagopalan (Author)
4. Environment & Ecology - A Dynamic Approach 2ed Paperback – by Neeraj Nachiketa (Author)
5. [https://www2.hcmuaf.edu.vn/data/quoctuan/Basics\\_of\\_Environmental\\_Sci%20\(Section%201\).pdf](https://www2.hcmuaf.edu.vn/data/quoctuan/Basics_of_Environmental_Sci%20(Section%201).pdf)
6. [http://rvskv.net/images/Environmental-Science\\_23.04.2020.pdf](http://rvskv.net/images/Environmental-Science_23.04.2020.pdf)

**MODALITY OF ASSESSMENT (SEMESTER WISE)****A. Theory Examination Pattern:****Semester I****Internal Assessment - 40%****Paper I RUVGHM 101 SOIL AND WATER MANAGEMENT – I**

Sr No	Evaluation type	Marks
1	Assignment/ Project/Case Study	25
2	Assignment / Presentation	15
<b>Total</b>		<b>40</b>

**Paper II RUVGHM 102 INTEGRATED NUTRIENT MANAGEMENT – I**

Sr No	Evaluation type	Marks
1	Assignment / Presentation	10



2	Maintenance of Greenhouse	10
<b>Total</b>		<b>40</b>

**Paper III RUVGHM 103 INTEGRATED PEST MANAGEMENT - I**

Sr No	Evaluation type	Marks
1	Assignment/ Project/ Case Study	10
2	Assignment / Presentation	10
<b>Total</b>		<b>20</b>

**Paper IV RUVGHM 104 INTRODUCTION TO PROTECTED CULTIVATION - I**

Sr No	Evaluation type	Marks
1	Assignment/ Project/ Case Study	10
2	Assignment / Presentation	10
<b>Total</b>		<b>20</b>

**Paper V RUVGHM 105 COMMUNICATION SKILLS – III, ICT SKILLS – III & BUSINESS SKILLS - I**

Sr No	Evaluation type	Marks
1	Assignment/Case Study/Survey/Presentation/ Skit/ Project from Communication Skills	20
2	Assignment/Case Study/Survey/Presentation/ Skit/ Project from ICT Skills	20
3	Assignment/Case Study/Survey/Presentation/ Skit/ Project from Business Skills	20
<b>Total</b>		<b>60</b>

**Paper VI RUVGHM 106 ENVIRONMENTAL SCIENCE - I**

Sr No	Evaluation type	Marks
1	Assignment/ Project/ Case Study	20
2	Assignment/ Report	20



3	Presentation	20
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**External Examination- 60%**

**SEMESTER END THEORY EXAMINATION:  
SEMESTER I**

**Paper I RUVGHM 101 SOIL AND WATER MANAGEMENT – I**

Questions	Options	Marks	Questions on
Q1	Any 5 out of 7	15	Unit I
Q.2	Any 5 out of 7	15	Unit II
Q.3	Any 5 out of 7	30	Unit I & II
<b>Total</b>		<b>60</b>	

**Paper II RUVGHM 102 INTEGRATED NUTRIENT MANAGEMENT – I**

Questions	Options	Marks	Questions on
Q1	Any 5 out of 7	15	Unit I
Q.2	Any 5 out of 7	15	Unit II
<b>Total</b>		<b>30</b>	

**Paper III RUVGHM 103 INTEGRATED PEST MANAGEMENT - I**

Questions	Options	Marks	Questions on
Q1	Any 5 out of 7	15	Unit I
Q.2	Any 5 out of 7	15	Unit II
<b>Total</b>		<b>30</b>	

**Paper IV RUVGHM 104 INTRODUCTION TO PROTECTED CULTIVATION - I**

Questions	Options	Marks	Questions on
Q1	Any 5 out of 7	15	Unit I
Q.2	Any 5 out of 7	15	Unit II
<b>Total</b>		<b>30</b>	

**Paper V RUVGHM 105 COMMUNICATION SKILLS – III, ICT SKILLS – III & BUSINESS SKILLS - I**

Questions	Options	Marks	Questions on
Q1	Any 5 out of 7	30	Unit I
Q.2	Any 5 out of 7	30	Unit II
Q3.	Any 5 out of 7	30	Unit I & II
<b>Total</b>		<b>90</b>	

**Paper VI RUVGHM 106 ENVIRONMENTAL SCIENCE -I**

Questions	Options	Marks	Questions on
Q1	Any 5 out of 7	30	Unit I
Q.2	Any 5 out of 7	30	Unit II
Q3.	Any 5 out of 7	30	Unit I & II
<b>Total</b>		<b>90</b>	

**Practical Examination Pattern:**

**A) Internal Examination: 40%**

**Paper I RUVGHMP 101 SOIL AND WATER MANAGEMENT – I**

Sr No	Evaluation type	Marks
1	Assignment/ Project/ Photojournal/ Video based test	30
2	Assignment/Research based project/ Presentation/ Survey	30
3	Assignment / Presentation/ Reports Case Studies/	20
<b>Total</b>		<b>80</b>

**Paper II RUVGHMP 102 INTEGRATED NUTRIENT MANAGEMENT – I**

Sr No	Evaluation type	Marks
1	Assignment/Research based project/ Presentation	20
2	Calculations/ Reports/ Case Studies/	20
3	Maintenance of Greenhouse	20

<b>Total</b>	<b>60</b>
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**Paper III RUVGHMP 103 INTEGRATED PEST MANAGEMENT - I**

<b>Sr No</b>	<b>Evaluation type</b>	<b>Marks</b>
1	Assignment / Pest & Disease Scouting / Project	30
2	Assignment / Project	30
3	Presentation / Research based project	20
<b>Total</b>		<b>80</b>

**Paper IV RUVGHMP 104 INTRODUCTION TO PROTECTED CULTIVATION - I**

<b>Sr No</b>	<b>Evaluation type</b>	<b>Marks</b>
1	Assignment / Project / Case Study	20
2	Model making / Presentation	20
<b>Total</b>		<b>40</b>

**Paper V RUVGHMP 105 COMMUNICATION SKILLS – III, ICT SKILLS – III & BUSINESS SKILLS – I**

<b>Sr No</b>	<b>Evaluation type</b>	<b>Marks</b>
1	Assignment/Project/Skit/ Presentation based on Communication Skills.	15
2	Assignment/Project/Skit/ Presentation based on Communication Skills	15
3	Assignment/Project/ Presentation based on ICT Skills	15
4	Assignment/Project/ Presentation based on ICT Skills	15
5	Assignment/Project/Skit/ Presentation based on Business Skills	20
6	Assignment/Project/Skit/ Presentation based on Business Skills	20
<b>Total</b>		<b>100</b>

**Paper VI RUVGHMP 106 ENVIRONMENTAL SCIENCE - I**

Sr No	Evaluation type	Marks
1	Assignment/Project/Model/Presentation	20
<b>Total</b>		<b>20</b>

**B) External Examination: 60%****Semester End Practical Examination:****Paper I RUVGHMP 101 SOIL AND WATER MANAGEMENT – I**

Particulars	Paper
Experiments	90
Reports	10
Viva	10
Journal	10
<b>Total</b>	<b>120</b>

**Paper II RUVGHMP 102 INTEGRATED NUTRIENT MANAGEMENT – I**

Particulars	Paper
Experiments	60
Reports	10
Viva	10
Journal	10
<b>Total</b>	<b>90</b>

**Paper III RUVGHMP 103 INTEGRATED PEST MANAGEMENT - I**

Particulars	Paper
Experiments	90
Reports	10
Viva	10
Journal	10

<b>Total</b>	<b>120</b>
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**Paper IV RUVGHMP 104 INTRODUCTION TO PROTECTED CULTIVATION – I**

<b>Particulars</b>	<b>Paper</b>
Experiments	40
Viva	10
Journal	10
<b>Total</b>	<b>60</b>

**Paper V RUVGHMP 105 COMMUNICATION SKILLS – III, ICT SKILLS – III & BUSINESS SKILLS – I**

<b>Particulars</b>	<b>Paper</b>
Experiments Communication Skills	30
Experiments ICT Skills	30
Experiments Business Skills	30
Viva	30
Journal	10
<b>Total</b>	<b>150</b>

**Paper VI RUVGHMP 106 ENVIRONMENTAL SCIENCE – I**

<b>Particulars</b>	<b>Paper</b>
Experiments	20
Viva	05
Journal	05
<b>Total</b>	<b>30</b>

## Overall Examination & Marks Distribution Pattern

### SEMESTER I

#### THEORY

Paper code	Paper name	Total marks	Internal marks	External marks	Time	Credits
RUVGHM 101	Soil and Water Management - I	100	40	60	2 hrs	02
RUVGHM 102	Integrated Nutrient Management - I	50	20	30	1 hr	01
RUVGHM 103	Integrated Pest Management - I	50	20	30	1 hr	01
RUVGHM 104	Introduction to protected Cultivation - I	50	20	30	1 hr	01
RUVGHM 105	Communication Skills-I, ICT Skills -I & Business Skills -I	150	60	90	2 hrs	03
RUVGHM 106	Environmental Studies -I	150	60	90	2 hrs	03
<b>Total</b>		<b>550</b>				

### PRACTICALS

Paper code	Paper name	Total marks	Internal marks	External marks	Credits
RUVGHM P101	Soil and Water Management-I	200	80	120	04
RUVGHM P102	Integrated Nutrient Management-I	150	60	90	03
RUVGHM P103	Integrated Pest Management-I	200	80	120	04
RUVGHM P104	Introduction to Protected Cultivation	100	40	60	02
RUVGHMP 105	Communication Skills-I, ICT Skills –I & Business Skills -I	250	100	150	05
RUVGHMP 106	Environmental Studies-I	50	20	30	01
<b>Total</b>		<b>950</b>			

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**SEMESTER II****Course Code: RUVGHM 201****Course Title : PROTECTED CULTIVATION – I****ACADEMIC YEAR 2020-21**

<b>COURSE OUTCOME</b>	<b>CO DESCRIPTION</b>
<b>CO 1</b>	Operate the curtains, vents and other components of greenhouse.
<b>CO 2</b>	Prepare soil for cultivation of fenugreek, coriander and Okra.
<b>CO 3</b>	Propagate plants using artificial means like cutting, grafting, budding, layering.
<b>CO 4</b>	Understand the basics of soilless cultivation.
<b>CO5</b>	Compare and contrast between soil and soilless cultivation.

**DETAILED SYLLABUS**

<b>Course Code/ Unit</b>	<b>Unit</b>	<b>Course/ Unit Title</b>	<b>Credits/ Lectures</b>
<b>RUVGHM201</b>	I	<b>Greenhouse cultivation</b> Knowledge of operating the curtains, vents, fan pads. Preparation of soil for planting, special agricultural techniques. Oxygenic cultivation of fenugreek, coriander and Okra. Plant propagation- cutting, grafting, budding, layering.	3 credit, 25 Lectures
	II	<b>Soilless cultivation</b> Origin and History Soilless Culture, its advantages and Disadvantages, Soilless cultivation verses soil cultivation. Active and passive types and Components of Soilless Cultivation.	20 Lectures

**PRACTICALS**

<b>Code</b>	<b>Topics</b>	<b>Credits</b>
<b>RUVGHMP 201</b>	<b>PROTECTED CULTIVATION - I</b>	<b>6</b>
<b>1</b>	Operating the curtains, vents, fan pads.	
<b>2</b>	Sterilization of soil in a greenhouse	
<b>3</b>	Preparation of different soil mixture	
<b>4</b>	Preparation of bed and planting techniques for leafy vegetables.	
<b>5</b>	Plant propagation through cutting	
<b>6</b>	Plant propagation through budding	
<b>7</b>	Plant propagation through layering	
<b>8</b>	Plant propagation through grafting	
<b>9</b>	Study of different components of hydroponics system	
<b>10</b>	Transplanting seedlings/ cuttings to hydroponics system	
<b>11</b>	Health & Safety while carrying out soilless cultivation./hydroponics	



### REFERENCES

1. Pant V, Nelson. 1991. *Green House Operation and Management*. Bali Publ.
- 2 Ramachandrappa and Nanjappa. *Fertigation Technology*, Agrobios, India
- 3 Prasad S and Kumar U. *Green House Management for Horticultural Crops*. Agrobios India
- 4 UCSC Farm & Garden Apprenticeship- S Edited by Martha Brown, Jan Perez, and Albie Miles 3RD EDITION Revised & Expanded Teaching Organic Farming & Gardening
- 5 <https://casfs.ucsc.edu/about/publications/Teaching-Organic-Farming/PDF-downloads/TOFG-all.pdf>
- 6 Alex Lauric and Victor h Ries. *Floriculture, Fundamentals and Practices* .Agrobios, India
- 7 Ramachandrappa and Nanjappa. *Fertigation Technology*, Agrobios, India
- 8 Prasad S and Kumar U. *Green House Management for Horticultural Crops*. Agrobios India
- 9 Prasad S and Kumar U. *Principles of Horticulture* .Agrobios India.
- 10 <http://www.fao.org/3/a-i3284e.pdf>
- 11 [http://agritech.tnau.ac.in/agricultural\\_engineering/greenhouse.pdf](http://agritech.tnau.ac.in/agricultural_engineering/greenhouse.pdf)
- 12 <https://ag.umass.edu/sites/ag.umass.edu/files/book/pdf/greenhousebmpfb.pdf>

**Course Code: RUVGHM 202**  
**Course Title : HARVESTING – I**

COURSE OUTCOME	CO DESCRIPTION
CO 1	Introduce the learners to the basic concept of plant physiology.
CO 2	Know and understand the pre-harvesting, sub-harvesting and post-harvesting of vegetables.
CO 3	Know the physiology of various stages of growth of crops like spinach, amaranth, fenugreek, coriander and okra.
CO 4	Understand the concept of maturity index.
CO5	Identify harvesting tools, classify vegetables into different categories.
CO6	Learn and follow Good Agricultural Practice.

### DETAILED SYLLABUS

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
RUVGHM202	I	<b>Introductory crop physiology</b> Introductory crop physiology- water relation, osmosis, photosynthesis, translocation, transpiration, absorption. Crop physiology of leafy vegetable crops spinach, amaranth, fenugreek, coriander and Okra.	1 credit, 6 Lectures
	II	<b>Introduction to concepts of stages of harvesting</b> such as pre-harvesting, sub-harvesting and post-harvesting of	9 Lectures

		vegetables. Classification of vegetables under their characteristics such as leafy, root, fruity and spicy vegetables; and classification according to criteria of nutrition, trade and cooking. Harvesting tools. Quality parameters of the above crops. Postharvest handling of above crops. Good Agricultural Practice (GAP) In Pre-Processing, Packaging, Storage And Transport Of Fresh Vegetables	
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### PRACTICALS

Code	Topics	Credits
RUVGHMP 202	HARVESTING – I	2
1	Study of different harvesting techniques	
2	Identification of different tools used in harvesting of leafy vegetable crop.	
3	To identify the harvesting indices of leafy vegetables.	
4	Nutrient analysis of crop grown in greenhouse.	
5	Postharvest handling of above crops	
6	Comparative study of protein and chlorophyll content of organically and inorganically grown plant	

### REFERENCES

- 1 Bose, T.K. and Som, T. K. 1986. Vegetable Crops in India. Naya Prakash, Kolkata.
2. Harvest year Book by Cris Peterson
3. [https://www.jica.go.jp/nepal/english/office/others/c8h0vm0000bjww96-att/tm\\_2.pdf](https://www.jica.go.jp/nepal/english/office/others/c8h0vm0000bjww96-att/tm_2.pdf)
4. <https://www.ccmgatx.org/media/19498/Harvesting-Vegetables.pdf>
5. [https://irrec.ifas.ufl.edu/postharvest/HOS\\_5085C/Reading%20Assignments/Kader-6-Maturation%20and%20Maturity%20Indices.pdf](https://irrec.ifas.ufl.edu/postharvest/HOS_5085C/Reading%20Assignments/Kader-6-Maturation%20and%20Maturity%20Indices.pdf)

Course Code: RUVGHM 203

Course Title : COMMUNICATION SKILLS - II & ICT SKILLS - II

ACADEMIC YEAR 2020-21

COURSE OUTCOME	CO DESCRIPTION
CO 1	Write reports, document business records.
CO 2	Enhance the skill of appearing for interview.
CO 3	Demonstrate lessons on personal grooming.
CO 4	Acquaint with the working of computers, knowledge of MS word software.
CO5	Work on Google cloud for documentation.

### DETAILED SYLLABUS

Course	Unit	Course/ Unit Title	Credits/
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Code/ Unit			Lectures
RUVGHM203	I	<b>Communication Skills - II</b> Record keeping, report writing, types of report writing. Personal grooming, appearing for interviews.	2 credit, 15 Lectures
	II	<b>ICT Skills - II</b> Connections, Basic knowledge of MS word, creating files, and other functions of MS, Working with MS. Word 365 for Reviewing Document, Working with Google Cloud for Documents online.	15 Lectures

### PRACTICALS

Code	Topics	Credits
RUVGHMP 203	<b>COMMUNICATION SKILLS - II &amp; ICT SKILLS - II</b>	4
1	Letter writing (Formal, Informal) {Job application, permission letter}	
2	Resume writing	
3	Record keeping.	
4	MS Word – Create a file, folder, alignments, spacing.....	

### REFERENCES

- <https://www.gfmer.ch/Informatics/Presentations/postgrad2005/presentation.pdf>
- [https://www.dit.ie/media/ittraining/msoffice/MOAC\\_Powerpoint\\_2016.pdf](https://www.dit.ie/media/ittraining/msoffice/MOAC_Powerpoint_2016.pdf)
- Book-How to talk to anyone by Leil Lowndes
- Influencer: The new science of leading change by Joseph Grenny, Kerry Patterson, David Maxfield, Ron McMillan and Al Switzler
- Talk like TED: The 9 public speaking secrets by Carmine Gallo
- Crucial conversations by Joseph Grenny, Kerry Patterson, Ron McMillan and Al Switzler
- <https://www.bankexamstoday.com/2019/04/letter-writing-format-types-and-sample.html>
- <http://ncert.nic.in/textbook/pdf/kehb115.pdf>
- Mukesh Sharma-Basic Computer Course: A Freshers Guide To Modern Day Computing
- J. Clark Scott-But How Do It Know? - The Basic Principles of Computers for Everyone
- [https://www.vfu.bg/en/e-Learning/Computer-Basics--computer\\_basics2.pdf](https://www.vfu.bg/en/e-Learning/Computer-Basics--computer_basics2.pdf)
- [http://www.just.edu.jo/~mqais/CIS99/PDF/Ch.01\\_Introduction\\_%20to\\_computers.pdf](http://www.just.edu.jo/~mqais/CIS99/PDF/Ch.01_Introduction_%20to_computers.pdf)

**Course Code: RUVGHM 204**

**Course Title : BUSINESS SKILLS – II & MANAGERIAL SKILLS – I**

**ACADEMIC YEAR 2020-21**

COURSE OUTCOME	CO DESCRIPTION
CO 1	Learn the social and telephone etiquettes.
CO 2	Understand body language and role play.
CO 3	Manage and organize office.
CO 4	Develop self- awareness on issues of emotional Intelligence, self- learning.

**DETAILED SYLLABUS**

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
RUVGHM204	I	<b>Management of Meetings</b> –selling skills, social etiquette and telephone etiquette, role play and body language.	2 credit, 15 Lectures
	II	<b>Managerial Skills – I</b> Introduction to General Management, Organization and Management of office, Functions of Management, Principles of Management. Developing self- awareness on issues of emotional Intelligence, self- learning.	15 Lectures

**PRACTICALS**

Code	Topics	Credits
RUVGHMP 204	<b>BUSINESS SKILLS – II &amp; MANAGERIAL SKILLS – I</b>	4
1	Managing a meeting- Seating arrangement according to protocol	
2	Agenda of a meeting.	
3	Minutes of a meeting	
4	Mock meeting	
5	Phone etiquettes	

**REFERENCES**

- 1 [https://www.ippr.org/files/publications/pdf/business-skills\\_Nov2016.pdf](https://www.ippr.org/files/publications/pdf/business-skills_Nov2016.pdf)
- 2 <https://www.workinculture.ca/workinculture/storage/medialibrary/Resources/Our%20Publications/Skills-for-Success-Final-Report.pdf>
- 3 <http://www.fao.org/3/a-at412e.pdf>
- 4 The Ultimate Book of Business Skills: The 100 Most Important Techniques for Being Successful in Business Book by Laura Brown and Tony Grundy

<b>RUVGHMP 205</b>	<b>Work Integrated Learning – I (Internship)- Skill component (15 days- greenhouse/polyhouse design and structures, maintenance of greenhouse, trouble shooting)</b>	<b>6 credits</b>
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**MODALITY OF ASSESSMENT**

**SEMESTER II****Internal Assessment - 40%****Paper I, RUVGHM 201 - PROTECTED CULTIVATION - I**

Sr No	Evaluation type	Marks
1	Assignment/Project/Survey/Model	25
2	Assignment/Project/Survey/Case Study	25
3	Presentation	10
<b>Total</b>		<b>60</b>

**Paper II RUVGHM202 - HARVESTING - I**

Sr No	Evaluation type	Marks
1	Assignment/ Photojournal/ Presentation/ Video based test	10
2	Maintenance of Greenhouse	10
<b>Total</b>		<b>20</b>

**Paper III, RUVGHM203 - COMMUNICATION SKILLS - II & ICT SKILLS - II**

Sr No	Evaluation type	Marks
1	Assignment/ Presentation/Report writing for Communication Skills	10
2	Assignment/ Presentation/Project for ICT Skills	10
<b>Total</b>		<b>20</b>

**Paper IV, RUVGHM204 - BUSINESS SKILLS -II & MANAGERIAL SKILLS - I**

Sr No	Evaluation type	Marks
1	Assignment/ Presentation/Report writing for Business Skills	10
2	Assignment/ Presentation/Project for Managerial Skills	10
<b>Total</b>		<b>20</b>

**Semester End Theory Assessment**

**Paper I RUVGHM 201 - PROTECTED CULTIVATION - I**

Questions	Options	Marks	Questions on
Q1	Any 5 out of 7	30	Unit I
Q.2	Any 5 out of 7	30	Unit II
Q.3	Any 5 out of 7	30	Unit I & II
<b>Total</b>		<b>90</b>	

**Paper II RUVGHM202 - HARVESTING – I**

Questions	Options	Marks	Questions on
Q1	Any 5 out of 7	15	Unit I
Q.2	Any 5 out of 7	15	Unit II
<b>Total</b>		<b>30</b>	

**Paper III RUVGHM203 - COMMUNICATION SKILLS – II & ICT SKILLS - II**

Questions	Options	Marks	Questions on
Q1	Any 1 out of 2	10	Unit I
Q.2	Any 4 out of 6	20	Unit I
Q.3	Any 5 out of 7	30	Unit II
<b>Total</b>		<b>60</b>	

**Paper IV RUVGHM204 - BUSINESS SKILLS –II & MANAGERIAL SKILLS – I**

Questions	Options	Marks	Questions on
Q1	Any 5 out of 7	30	Unit I
Q.2	Any 5 out of 7	30	Unit II
<b>Total</b>		<b>60</b>	

**Practical Examination Pattern:****Internal Examination: 40%****Paper I RUVGHMP 201 - PROTECTED CULTIVATION - I**

Sr No	Evaluation type	Marks
1	Assignment/ Project/ Video based test/ Photojournal	30
2	Assignment / Case Study/ Survey/ Research based project	30
3	Maintenance of Greenhouse	30
4	Models/ Assignment / Presentation/ Model / Report	30
<b>Total</b>		<b>120</b>

**Paper II RUVGHMP202 - HARVESTING - I**

Sr No	Evaluation type	Marks
1	Assignment/ Video based test/Model	20
2	Assignment / Project/ Presentation	20
<b>Total</b>		<b>40</b>

**Paper III RUVGHMP 203 - COMMUNICATION SKILLS - II & ICT SKILLS - II**

No	Evaluation type	Marks
1	Assignment/ Presentation/ Project/ Case Study/ Survey for Communication Skills	20
2	Assignment/ Presentation/ Project/ Case Study/ Survey for Communication Skills	20
3	Assignment/ Presentation/ Project/ Case Study/ Survey for ICT Skills	20
4	Assignment/ Presentation/ Project/ Case Study/ Survey for ICT Skills	20
<b>Total</b>		<b>80</b>

**Paper IV RUVGHMP204 - BUSINESS SKILLS –II & MANAGERIAL SKILLS – I**

No	Evaluation type	Marks
1	Assignment/ Presentation/ Project/ Case Study/ Survey/ Role play for Business Skills	20
2	Assignment/ Presentation/ Project/ Case Study/ Survey / Role play for Business Skills	20
3	Assignment/ Presentation/ Project/ Case Study/ Survey / Role play for Managerial Skills	20
4	Assignment/ Presentation/ Project/ Case Study/ Survey / Role play for Managerial Skills	20
<b>Total</b>		<b>80</b>

**A) External Examination: 60%**

**Semester End Practical Examination:**

**Paper I RUVGHMP 201 -PROTECTED CULTIVATION - I**

Particulars	Paper
Experiments	150
Reports	10
Viva	10
Journal	10
<b>Total</b>	<b>180</b>

**Paper II RUVGHMP202 - HARVESTING – I**

Particulars	Paper
Experiments	40
Viva	10
Journal	10
<b>Total</b>	<b>60</b>



**Paper III RUVGHMP 203 - COMMUNICATION SKILLS – II & ICT SKILLS – II**

<b>Particulars</b>	<b>Paper</b>
Experiments on Communication Skills	45
Experiments on ICT Skills	45
Viva	20
Journal	10
<b>Total</b>	<b>120</b>

**Paper IV, RUVGHMP204 - BUSINESS SKILLS –II & MANAGERIAL SKILLS – I**

<b>Particulars</b>	<b>Paper</b>
Experiments on Communication Skills	45
Experiments on ICT Skills	45
Viva	20
Journal	10
<b>Total</b>	<b>120</b>

### Overall Examination & Marks Distribution Pattern

#### THEORY

Paper code	Paper name	Total marks	Internal marks	External marks	Time	Credits
RUVGHM 201	Protected Cultivation - I	150	60	90	2 ½ hrs	03
RUVGHM 202	Harvesting - I	50	20	30	1 hr	01
RUVGHM 203	Communication Skills-II & ICT Skills -II	100	40	60	2 hrs	02
RUVGHM 204	Business Skills –II & Managerial Skills – I	100	40	60	2 hrs	02
<b>Total</b>		<b>400</b>				

#### PRACTICALS

Paper code	Paper name	Total marks	Internal	External	Time	Credits
RUVGHMP 201	Protected Cultivation - I	300	120	180	5 hrs	06
RUVGHM P202	Harvesting - I	100	40	60	3 hrs	02
RUVGHMP 203	Communication Skills-II & ICT Skills -II	200	80	120	4 hrs	04
RUVGHMP 204	Business Skills –II & Managerial Skills – I	200	80	120	4 hrs	04
RUVGHM P205	<b>Internship</b>	<b>300</b>	<b>Passing</b> <b>150</b>	<b>15 days</b>		<b>06</b>
<b>Total</b>		<b>1100</b>				

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**SEMESTER III****Course Code: RUVGHM 301****Course Title : SOIL AND WATER MANAGEMENT – II****ACADEMIC YEAR 2020-21**

<b>COURSE OUTCOME</b>	<b>CO DESCRIPTION</b>
<b>CO 1</b>	Knowledge about the elementary components of soil.
<b>CO 2</b>	Manage the soil and water using various means of conserving soil and water.
<b>CO 3</b>	Understand the relationship between soil, water and plant nutrients
<b>CO 4</b>	Manipulate the soil as per the crop requirement.
<b>CO5</b>	Install drip irrigation system, sterilize the soil for cultivation.
<b>CO6</b>	Evaluate the emitter size depending upon the crops cultivated.

**DETAILED SYLLABUS**

<b>Course Code/ Unit</b>	<b>Unit</b>	<b>Course/ Unit Title</b>	<b>Credits/ Lectures</b>
<b>RUVGHM301</b>	<b>I</b>	<b>Soil management</b> Elementary component of soil, soil water retention, Plant Nutrients and Availability in Soil pH; Acidifying and Liming of Soils, Soil-Water Relationships. Soil sterilization, Use of nanosilver for sterilization.	2 Credit, 15 Lectures
	<b>II</b>	<b>Water management</b> Precipitation, interception, evaporation, transpiration and factors influencing them. Installation of drip irrigation system, appropriate irrigation system for cultivation of vegetables and fruit crop. Calculation of emitter size depending on the cultivated crops.	15 Lectures

**PRACTICALS**

<b>Code</b>	<b>Topics</b>	<b>Credits</b>
<b>RUVGHMP 301</b>	<b>SOIL AND WATER MANAGEMENT – II</b>	<b>4</b>
<b>1</b>	Identification of different type of soil.	
<b>2</b>	To determine the pH of the given soil sample.	
<b>3</b>	To study the effect of Silver nano particles on fertility of soil.	
<b>4</b>	Determine the heavy metal content from the soil.	
<b>5</b>	Determine the heavy metals content in water.	
<b>6</b>	Test for salinity of the given water sample.	
<b>7</b>	Test for hardness of the given water sample.	
<b>8</b>	Installation of drip irrigation systems .	
<b>9</b>	Interpretation of soil testing report.	

## REFERENCES

- 1 [http://nmsp.cals.cornell.edu/publications/extension/NRCCA\\_Manual\\_Soil\\_and\\_Water\\_10\\_26\\_2016.pdf](http://nmsp.cals.cornell.edu/publications/extension/NRCCA_Manual_Soil_and_Water_10_26_2016.pdf)
- 2 Ramachandrappa and Nanjappa. *Fertigation Technology*, Agrobios, India
- 3 Prasad S and Kumar U. *Green House Management for Horticultural Crops*. Agrobios India
- 4 Biswas T D and Mukherjee S K .*Text Book of Soil Science* by, Tata McGraw-Hill Publishing Company Limited.
- 5 Prasad S and Kumar U 2003. Greenhouse management of horticultural crops. 2 Agrobios.
- 6 Principles of drip irrigation system, Dr. M.S. Mane, B.L.Ayare, Dr. S.S.Magar., New Delhi
- 7 Principles of sprinkler irrigation, Dr. M.S. Mane ,Dr.B.L. Ayare. Jain Bros., New Delhi
- 8 Tisdale and Nelson, book – soil fertility and fertilizers.
- 9 Eric lichtfouse-sustainable agriculture reviews-1-organic farming pest control and remediation of soil pollutants-springer publication-ebook

**Course Code: RUVGHM 302**

**Course Title : INTEGRATED NUTRIENT MANAGEMENT – II**

COURSE OUTCOME	CO DESCRIPTION
<b>CO 1</b>	Know, understand and recall the nutrient requirement of plants.
<b>CO 2</b>	Identify the nutrient deficiency symptoms.
<b>CO 3</b>	Understand the physiological processes of mineral absorption and translocation.

### DETAILED SYLLABUS

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
<b>RUVGHM302</b>	I	<b>Plant Nutrient</b> – Macro nutrients - Nitrogen, Phosphorus Potassium, Sulphur. Micronutrient - Calcium, Magnesium, Iron, Manganese, Copper, Zinc, Boron, Molybdenum Orthosalicyclic acid . Functions and Deficiency Symptoms of Essential Minerals : Major and Minor elements required by plants, Functions and Deficiency Symptoms, Dosage calculation of fertilizer and nutrient appropriate to the plant (vegetable and fruits)	1 credit, 8 Lectures
	II	<b>Absorption and translocation</b> Mineral Salt absorption and translocation. Types of Absorption: passive and active, Factors affecting salt absorption, Translocation.	7 Lectures

**PRACTICALS**

Code	Topics	Credits
<b>RUVGHMP 302</b>	<b>INTEGRATED NUTRIENT MANAGEMENT – II</b>	<b>3</b>
<b>1</b>	Identification of specific mineral deficiency symptoms in plants (soil/soilless)	
<b>2</b>	Test for the presence of nitrogen , phosphorus, potassium in the leafy, fruit and root vegetable	
<b>3</b>	Test for the presence of boron, calcium, iron, copper in the leafy, fruit and root vegetable	
<b>4</b>	To calculate the fertilizer dosage to be applied to the given crop.	
<b>5</b>	Dosage calculation of nutrient appropriate to the plant (vegetable and fruits)	

**REFERENCES**

- <https://repositorio.iica.int/bitstream/handle/11324/4188/BVE17089202i.pdf>
- <https://www.nap.edu/read/18674/chapter>
- Pradeepkumar T, Suma B, Jyothibhaskar & Satheesan KN. 2007. *Management of Horticultural Crops*. Parts I, II by New India Publications.
- Dharma Abrol-Integrated Pest Management-1<sup>st</sup> Edition-By current concepts and ecological prospective.
- Ram Singh & Vikas Jindal G.S. Dhaliwal-book- A Textbook of Integrated Pest Management Paperback – 1 January 2013
- <https://agrimoon.com/wp-content/uploads/Insect-Ecology-Integrated-Pest-Management.pdf>

**Course Code: RUVGHM 303****Course Title : PROTECTED CULTIVATION – II**

COURSE OUTCOME	CO DESCRIPTION
<b>CO 1</b>	Understand the specifications and prepare bed for cultivation of fruit and vegetable crops.
<b>CO 2</b>	Gain through knowledge about soilless cultivation.
<b>CO 3</b>	Create a novel hydroponic system.
<b>CO4</b>	Address all the teething problems arising in soilless cultivation.

**DETAILED SYLLABUS**

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
<b>RUVGHM303</b>	<b>I</b>	<b>Greenhouse Cultivation</b> Greenhouse cultivation of fruit (Strawberry and cucumber)/ flower (Gladiolus and Rose) & leafy vegetable (lettuce) indigenous and exotic. Bed preparation in greenhouse for fruit/ vegetables crop.	<b>1 Credit, 7 Lectures</b>

	II	<b>Soiless cultivation</b> Hydroponics: Commercial Aspects and Recent Advancements Commercial Aspects, Advancements, Benefits of Hydroponics/Soiless Cultivation. Static solution culture, Continuous-flow solution culture — NFT technique , Aeroponics, Ebb and flow or flood and drain sub-irrigation, Deep water culture, Top-fed deep water culture Hydroponics in Greenhouse	8 Lectures
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### PRACTICALS

Code	Topics	Credits
RUVGHMP 303	<b>PROTECTED CULTIVATION – II</b>	4
1	Bed preparation in a greenhouse for the given fruit/ flowering crops	
2	Identification of types of hydroponics systems.	
3	Setting up a hydroponic system	
4	Comparative study of lettuce grown in a hydroponic system against soil.	
5	Comparative study of Pakchoy grown in a hydroponic system against soil.	
6	Study of EC and pH of various aggregate media used in hydroponics.	
7	Study of the different types of materials used for construction of a basic hydroponics system and its economics	

### REFERENCES

- 1 Pant V, Nelson. 1991. *Green House Operation and Management*. Bali Publ.
- 2 UCSC Farm & Garden Apprenticeship- S Edited by Martha Brown, Jan Perez, and Albie Miles 3RD EDITION Revised & Expanded Teaching Organic Farming & Gardening
- 3 <https://casfs.ucsc.edu/about/publications/Teaching-Organic-Farming/PDF-downloads/TOFG-all.pdf>
- 4 Alex Lauric and Victor h Ries. *Floriculture, Fundamentals and Practices*. Agrobios, India
- 5 Ramachandrappa and Nanjappa. *Fertigation Technology*, Agrobios, India
- 6 Prasad S and Kumar U. *Green House Management for Horticultural Crops*. Agrobios India
- 7 Prasad S and Kumar U. *Principles of Horticulture*. Agrobios India.
- 8 <http://www.fao.org/3/a-i3284e.pdf>
- 9 [http://agritech.tnau.ac.in/agricultural\\_engineering/greenhouse.pdf](http://agritech.tnau.ac.in/agricultural_engineering/greenhouse.pdf)
- 10 <https://ag.umass.edu/sites/ag.umass.edu/files/book/pdf/greenhousebmpfb.pdf>

**Course Code: RUVGHM 304****Course Title : INTEGRATED PEST MANAGEMENT-II**

COURSE OUTCOME	CO DESCRIPTION
CO 1	Identify and suggest control measures against disease and pests attacking specific crops.
CO 2	Understand, recall and follow the Integrated Pest and Disease Management rules.
CO 3	Fluent with all the quarantine rules and its implications.
CO4	Handle the fungicide, weedicide and pesticide responsibly.

**DETAILED SYLLABUS**

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
RUVGHM304	I	<b>Important Diseases of Vegetable crops/ Fruit Crops and their Control</b> Viral diseases: Leaf curl (Chilli, tomato, Papaya), Mosaic (Tomato, Crucifer, Cucurbit), Bacterial diseases: Bacterial wilt (Tomato), Citrus Canker (Citrus) Fungal diseases: <i>Anthrachnose</i> (Chilli), Powdery mildew (Chilli, cucurbits, rose, gerbera), Downy mildew (Onion, Crucifer, cucurbit), <i>Fusarium</i> Wilt (Tomato, Crucifers, Cucurbits, Fruit crops), <i>Alternaria</i> leaf spot (Crucifers, Chilli/Capsicum).	1 Credit, 7 Lectures
	II	<b>Important pests of Vegetable crops/ Fruit Crops and their Control</b> Basic principles of greenhouse/field scouting. Various equipments to be used in scouting (Magnifying glasses etc.) Important Pests of Vegetable crops/Cut flowers/Fruit Crops and their control - Aphids (Chilli, Brinjal, Cucurbits, Crucifers), Leaf Miner (Brinjal, Cucurbits, Crucifers) White Fly (Chilli, Brinjal) Thrips (Chilli, Rose, Carnation, Fruit crops), Mites (Chilli, Fruit crops), Caterpillar (Crucifer, Fruit crops), Fruit Borer (Brinjal, Cucurbits). Principles and methods of pest control: Physical, Chemical and Biological, IPM, Exclusion: Plant Quarantine and Inspection, Quarantine rules and regulations. Scouting and monitoring of insect & pest .Various mechanical controls (traps, sticky plates etc), natural enemies used for control. GMO control of pest. Non-toxic insect control, juvenile hormones.	8 Lectures

**PRACTICALS**

Code	Topics	Credits
<b>RUVGHMP 303</b>	<b>INTEGRATED PEST MANAGEMENT-II</b>	<b>2</b>
<b>1</b>	Study of the common diseases infecting plants grown in greenhouse.	
<b>2</b>	Study of the common pests attacking plants grown in greenhouse.	
<b>3</b>	Scouting of pests and diseases.	
<b>4</b>	Preparation of inorganic pesticides	
<b>5</b>	Preparation of organic pesticides	
<b>6</b>	Comparative study of organic and inorganic pesticides	
<b>7</b>	Identification of mechanical and biological control of pests attacking greenhouse plants	
<b>8</b>	Study of available insecticides / pesticides and reading the label.	
<b>9</b>	Computation of doses insecticides / pesticides	
<b>10</b>	Handling and storage of pesticides	

**REFERENCES**

- 1 <https://niphm.gov.in/Recruitments/ASO-Pathology.pdf>
- 2 [https://croplife.org/wp-content/uploads/pdf\\_files/Integrated-pest-management.pdf](https://croplife.org/wp-content/uploads/pdf_files/Integrated-pest-management.pdf)
- 3 Pradeepkumar T, Suma B, Jyothibhaskar & Satheesan KN. 2007. *Management of Horticultural Crops*. Parts I, II by New India Publications.
- 4 Dharma Abrol-Integrated Pest Management-1<sup>st</sup> Edition-By current concepts and ecological prospective.
- 5 Ram Singh & Vikas Jindal G.S. Dhaliwal-book- A Textbook of Integrated Pest Management Paperback – 1 January 2013
- 6 <https://agrimoon.com/wp-content/uploads/Insect-Ecology-Integrated-Pest-Management.pdf>

**Course Code: RUVGHM 305****Course Title : COMMUNICATION SKILLS – III & ICT SKILLS – III**

COURSE OUTCOME	CO DESCRIPTION
<b>CO 1</b>	Communicate effectively, prepare for interviews, conduct meeting.
<b>CO 2</b>	Make notices, agendas and minutes of meetings,
<b>CO 3</b>	Send & receive email, learn different digital means of marketing.
<b>CO4</b>	Operate MS office outlook, make Power point presentations.
<b>CO5</b>	Create applications depending on cultivation and or marketing need.
<b>CO6</b>	Develop a short film using computer applications.
<b>CO7</b>	Make bills and invoices using Excel.



**DETAILED SYLLABUS**

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
RUVGHM305	I	<b>Communication Skills</b> Preparing for Group Discussions, Oral Presentations, Conducting interviews, making of project report, conducting meetings - notice, agenda and minutes. Making posters, advertisements.	2 Credit, 15 Lectures
	II	<b>ICT Skills</b> Power point presentation, MS office outlook, internet surfing, e-mail, installation of software. Using Multimedia tools of Powerpoint , Developing short films using Windows Photos / Google Photos and Video Editor, Making Quick short films using Videos (for Ads), Using Photos and making movies using the same, Using Excel for making Bills and invoices.	15 Lectures

**PRACTICALS**

Code	Topics	Credits
RUVGHMP 305	<b>COMMUNICATION SKILLS – III &amp; ICT SKILLS – III</b>	4
1	Group Discussions,	
2	Oral Presentations	
3	Conducting interviews,	
4	Conducting meetings.	
5	Making posters,	
6	Advertisements	
7	Project report,	
8	Power point presentation	
9	MS outlook	
10	Internet surfing	
11	Email	
12	Installation of software	

**REFERENCES**

- 1 Practical English Usage Book by Michael Swan
- 2 <https://www.gfmer.ch/Informatics/Presentations/postgrad2005/presentation.pdf>
- 3 [https://www.dit.ie/media/ittraining/msoffice/MOAC\\_Powerpoint\\_2016.pdf](https://www.dit.ie/media/ittraining/msoffice/MOAC_Powerpoint_2016.pdf)
- 4 Book-How to talk to anyone by Leil Lowndes
- 5 Influencer: The new science of leading change by Joseph Grenny, Kerry Patterson, David Maxfield, Ron McMillan and Al Switzler
- 6 Talk like TED: The 9 public speaking secrets by Carmine Gallo
- 7 Crucial conversations by Joseph Grenny, Kerry Patterson, Ron McMillan and Al Switzler

- 8 <https://www.bankexamstoday.com/2019/04/letter-writing-format-types-and-sample.html>
- 9 <http://ncert.nic.in/textbook/pdf/kehb115.pdf>
- 10 Mukesh Sharma-Basic Computer Course: A Freshers Guide To Modern Day Computing
- 11 J. Clark Scott-But How Do It Know? - The Basic Principles of Computers for Everyone
- 12 [https://www.vfu.bg/en/e-Learning/Computer-Basics--computer\\_basics2.pdf](https://www.vfu.bg/en/e-Learning/Computer-Basics--computer_basics2.pdf)
- 13 [http://www.just.edu.jo/~mqais/CIS99/PDF/Ch.01\\_Introduction\\_%20to\\_computers.pdf](http://www.just.edu.jo/~mqais/CIS99/PDF/Ch.01_Introduction_%20to_computers.pdf)

**Course Code: RUVGHM 306**

**Course Title : BUSINESS SKILLS –III & MANAGERIAL SKILLS – II**

COURSE OUTCOME	CO DESCRIPTION
CO 1	Plan a business and write business project.
CO 2	Acquaint with policies governing agripreneurs.
CO 3	Understand the principles of a team building and imply basic managerial skills.

**DETAILED SYLLABUS**

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
RUVGHM306	I	<b>Business Skills –III</b> Project management and planning - Economics and business plan. Agripreneurship- Concept of Agripreneurship, Functions and clarifications of agripreneurs, Policies governing agripreneurs, Case studies of successful agripreneurs.	2 Credit, 15 Lectures
	II	<b>Managerial Skills - II</b> Team building- developing teams and team work, advantages of team, leading team, team membership, building relationship skills for developing positive interpersonal communication, importance of supporting communication, coaching and counselling, defensiveness and disconfirmation, principles of supportive communication, skill analysis and application in the above area.	15 Lectures

### PRACTICALS

Code	Topics	Credits
<b>RUVGHMP 306</b>	<b>BUSINESS SKILLS –III &amp; MANAGERIAL SKILLS – II</b>	4
1	Team building- advantages of team, Leading team, team membership.	
2	Building relationship skills for developing positive interpersonal communication	
3	Skill analysis and application of supporting communication, defensiveness and disconfirmation. .	
4	Make a business plan of an agri enterprise.	
5	Consider the subsidies and grants through government's policies, Bank loans.	
6	Study of fixed capital, recurring capital, miscellaneous expenses, project return, profit, loss and break even points.	

### REFERENCES

- 1 <http://rccmindore.com/wp-content/uploads/2015/06/Managerial-SkillsAll-Units-AC.pdf>
- 2 <https://2012books.lardbucket.org/books/an-introduction-to-business-v1.0/s10-06-managerial-skills.html>
- 3 [https://www.ippr.org/files/publications/pdf/business-skills\\_Nov2016.pdf](https://www.ippr.org/files/publications/pdf/business-skills_Nov2016.pdf)
- 4 <https://www.workinculture.ca/workinculture/storage/medialibrary/Resources/Our%20Publications/Skills-for-Success-Final-Report.pdf>
- 5 <http://www.fao.org/3/a-at412e.pdf>
- 6 The Ultimate Book of Business Skills: The 100 Most Important Techniques for Being Successful in Business Book by Laura Brown and Tony Grundy

### MODALITY OF ASSESSMENT

#### Theory Examination Pattern:

#### SEMESTER III

#### Internal Assessment - 40%

#### Paper I RUVGHM 301 - SOIL AND WATER MANAGEMENT – II

Sr No	Evaluation type	Marks
1	Assignment/ Project/ Calculations/Video based test/ Report	20
2	Assignment/ Research Project/ / Report/ Presentation/ Survey	20
<b>Total</b>		<b>40</b>

**Paper II RUVGHM 302 - INTEGRATED NUTRIENT MANAGEMENT – II**

Sr No	Evaluation type	Marks
1	Assignment/ Project/ Calculations/Video based test/ Report	10
2	Assignment/ Project/ Photojournal/ Case Study	10
<b>Total</b>		<b>20</b>

**Paper III RUVGHM 303 - PROTECTED CULTIVATION – II**

Sr No	Evaluation type	Marks
1	Assignment / Report/ Presentation	10
2	Maintenance of Greenhouse	10
<b>Total</b>		<b>20</b>

**Paper IV RUVGHM 304 - INTEGRATED PEST MANAGEMENT-II**

Sr No	Evaluation type	Marks
1	Assignment / Report/ Presentation	10
2	Maintenance of Greenhouse	10
<b>Total</b>		<b>20</b>

**Paper V RUVGHM 305 - COMMUNICATION SKILLS – III& ICT SKILLS - III**

Sr No	Evaluation type	Marks
		<b>20</b>
1	Assignment / Report/ Presentation/ Project for Business Skills	20
2	Assignment / Report/ Presentation/ Project for ICT Skills	20
<b>Total</b>		<b>40</b>

**Paper VI RUVGHM 306 - BUSINESS SKILLS –III & MANAGERIAL SKILLS - II**

Sr No	Evaluation type	Marks
		<b>20</b>
1	Assignment / Report/ Presentation/ Project for Business Skills	20
2	Assignment / Report/ Presentation/ Project for ICT Skills	20
<b>Total</b>		<b>40</b>

### Semester End Theory Assessment

#### Paper I RUVGHM 301 - SOIL AND WATER MANAGEMENT – II

Questions	Options	Marks	Questions on
Q1	Any 5 out of 7	15	Unit I
Q.2	Any 5 out of 7	15	Unit II
Q.3	Any 5 out of 7	30	Unit I & II
<b>Total</b>		<b>60</b>	

#### Paper II RUVGHM 302 - INTEGRATED NUTRIENT MANAGEMENT – II

Questions	Options	Marks	Questions on
Q1	Any 5 out of 7	15	Unit I
Q.2	Any 5 out of 7	15	Unit II
<b>Total</b>		<b>30</b>	

#### Paper III RUVGHM 303 - PROTECTED CULTIVATION – II

Questions	Options	Marks	Questions on
Q1	Any 5 out of 7	15	Unit I
Q.2	Any 5 out of 7	15	Unit II
<b>Total</b>		<b>30</b>	

#### Paper IV RUVGHM 304 - INTEGRATED PEST MANAGEMENT-II

Questions	Options	Marks	Questions on
Q1	Any 5 out of 7	15	Unit I
Q.2	Any 5 out of 7	15	Unit II
<b>Total</b>		<b>30</b>	

#### Paper V RUVGHM 305 - COMMUNICATION SKILLS – III& ICT SKILLS - III

Questions	Options	Marks	Questions on
Q1	Any 5 out of 7	30	Unit I
Q.2	Any 5 out of 7	30	Unit II

<b>Total</b>		<b>60</b>	
<b>Paper VI RUVGHM 306 - BUSINESS SKILLS –III &amp; MANAGERIAL SKILLS - II</b>			
<b>Questions</b>	<b>Options</b>	<b>Marks</b>	<b>Questions on</b>
Q1	Any 5 out of 7	30	Unit I
Q.2	Any 5 out of 7	30	Unit II
<b>Total</b>		<b>60</b>	

**Practical Examination Pattern:****Internal Examination: 40%****Paper I RUVGHMP 301 - SOIL AND WATER MANAGEMENT – II**

Sr No	Evaluation type	Marks
1	Assignment/ Calculation /Project / Success stories	30
2	Assignment / Research based project /Photojournal	30
3	Assignment / Presentation	20
<b>Total</b>		<b>80</b>

**Paper II RUVGHMP 302 - INTEGRATED NUTRIENT MANAGEMENT – II**

Sr No	Evaluation type	Marks
1	Assignment / Calculations / Project	20
2	Assignment / Research based project /Photojournal	20
3	Assignment / Research based project /Video based test	20
<b>Total</b>		<b>60</b>

**Paper III RUVGHMP 303 - PROTECTED CULTIVATION**

Sr No	Evaluation type	Marks
1	Assignment / Project/ Report	20
2	Maintenance of Greenhouse	20
<b>Total</b>		<b>40</b>

**Paper IV RUVGHMP 304 - INTEGRATED PEST MANAGEMENT-II**

Sr No	Evaluation type	Marks
1	Assignment / Project/ Report	20
2	Assignment /Project/ Report / Research based project /Video based test	20
<b>Total</b>		<b>40</b>

**Paper V RUVGHMP 305 - COMMUNICATION SKILLS – III& ICT SKILLS - III**

Sr No	Evaluation type	Marks
1	Assignment/ Presentation/ Project/ Case Study/ Survey for Communication Skills	20
2	Assignment/ Presentation/ Project/ Case Study/ Survey for Communication Skills	20
3	Assignment/ Presentation/ Project/ Case Study/ Survey for ICT Skills	20
4	Assignment/ Presentation/ Project/ Case Study/ Survey for ICT Skills	20
<b>Total</b>		<b>80</b>

**Paper VI RUVGHMP 306 - BUSINESS SKILLS –III & MANAGERIAL SKILLS - II**

Sr No	Evaluation type	Marks
1	Assignment/ Presentation/ Project/ Case Study/ Survey for Communication Skills	20
2	Assignment/ Presentation/ Project/ Case Study/ Survey for Communication Skills	20
3	Assignment/ Presentation/ Project/ Case Study/ Survey for ICT Skills	20
4	Assignment/ Presentation/ Project/ Case Study/ Survey for ICT Skills	20
<b>Total</b>		<b>80</b>

**A) External Examination: 60%****Semester End Practical Examination:****Paper I RUVGHMP 301 - SOIL AND WATER MANAGEMENT – II**

Particulars	Paper
Experiments	90
Reports	10
Viva	10
Journal	10
<b>Total</b>	<b>120</b>

**Paper II RUVGHMP 302 - INTEGRATED NUTRIENT MANAGEMENT – II**

Particulars	Paper
Experiments	70
Viva	10
Journal	10
<b>Total</b>	<b>90</b>

**Paper III RUVGHMP 303 - PROTECTED CULTIVATION**

Particulars	Paper
Experiments	90
Reports	10
Viva	10
Journal	10
<b>Total</b>	<b>120</b>

**Paper IV RUVGHMP 304 - INTEGRATED PEST MANAGEMENT-II**

Particulars	Paper
Experiments	40
Viva	10
Journal	10
<b>Total</b>	<b>60</b>



**Paper V RUVGHMP 305 - COMMUNICATION SKILLS – III& ICT SKILLS – III**

Particulars	Paper
Experiments on Communication Skills	20
Experiments on ICT Skills	20
Viva	10
Journal	10
<b>Total</b>	<b>60</b>

**Paper VI RUVGHMP 306 - BUSINESS SKILLS –III & MANAGERIAL SKILLS – II**

Particulars	Paper
Experiments on Business Skills	20
Experiments on Managerial Skills	20
Viva	10
Journal	10
<b>Total</b>	<b>60</b>

### Overall Examination & Marks Distribution Pattern

#### THEORY

Paper code	Paper name	Total marks	Internal marks	External marks	Time	Credits	
RUVGHM 301	Soil and Water Management – II	100	40	60	2 hrs	02	
RUVGHM 302	Integrated Nutrient Management – II	50	20	30	1 hr	01	
RUVGHM 303	Protected Cultivation – II	50	20	30	1 hr	01	
RUVGHM 304	Integrated Pest Management-II	50	20	30	1 hr	01	
RUVGHM 305	Communication Skills – III& ICT Skills - III	100	40	60	2 hrs	02	
RUVGHM 306	Business Skills –III& Managerial Skills - II	100	40	60	2 hrs	02	
<b>Total</b>		<b>450</b>					

#### PRACTICALS

Paper code	Paper name	Total marks	Internal marks	External marks	Credits
RUVGHM P301	Soil and Water Management – II	200	80	120	04
RUVGHM P302	Integrated Nutrient Management – II	150	60	90	03
RUVGHM P303	Protected Cultivation – II	200	80	120	04
RUVGHM P304	Integrated Pest Management-II	100	40	60	02
RUVGHMP 305	Communication Skills – III& ICT Skills - III	200	80	120	04
RUVGHMP 306	Business Skills –III & Managerial Skills - II	200	80	120	04
<b>Total</b>		<b>1050</b>			

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**SEMESTER IV****Course Code: RUVGHM 401****Course Title : PROTECTED CULTIVATION – III****ACADEMIC YEAR 2020-21**

COURSE OUTCOME	CO DESCRIPTION
CO 1	Cultivate cherry tomato and exotic vegetables
CO 2	Manipulate the hydroponic nutrient to suit the plant to be cultivated.
CO 3	Analyse and tackle the trouble shooting in soilless cultivation.
CO 4	Create innovations in developing new hydroponic systems.

**DETAILED SYLLABUS**

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
RUVGHM 401	I	<b>Green house cultivation of fruit vegetable and flower</b> Cultivation of cherry tomato (Fruit) , coloured capsicum and exotic (Leek, Rocket ). Cultivation of <i>Limonium</i> , gerbera and carnation (Flower).	2 credit, 15 Lectures
	II	<b>Hydroponics</b> Techniques in Hydroponics –Passive sub-irrigation, Dutch bucket, Deep water culture, Bubbleponics, Fogponics. Aggregate Media used for Hydroponics. Importance of media with reference to porosity and water holding capacity, Root zone management, Importance of media sterility. Importance of EC. pH of hydroponic media, climatic conditions. Maintenance of hydroponics systems – Sterilisation, cleaning, trouble shooting. Economics of a hydroponic set up	15 Lectures

**PRACTICALS**

Code	Topics	Credits
RUVGHMP 401	<b>PROTECTED CULTIVATION – III</b>	4
1	Study of micro-irrigation system generally used in a greenhouse.	
2	Study of different type of aggregate media used in hydroponic system	
3	Water holding capacity of different media used in hydroponic	
4	Study of the different types of automations implemented in a greenhouse made under Indo-dutch system.	
5	Training and pruning of cherry tomato	
6	Hand pollination in tomato and zucchini	
7	Study of controlling of various environmental parameters in a semi-automatically controlled greenhouse.	
8	Identification of varieties of cherry tomato and carnation cultivated in greenhouse	

## REFERENCES

- 1 Pant V, Nelson. 1991. *Green House Operation and Management*. Bali Publ.
- 2 UCSC Farm & Garden Apprenticeship- S Edited by Martha Brown, Jan Perez, and Albie Miles 3RD EDITION Revised & Expanded Teaching Organic Farming & Gardening
- 3 <https://casfs.ucsc.edu/about/publications/Teaching-Organic-Farming/PDF-downloads/TOFG-all.pdf>
- 4 Alex Lauric and Victor h Ries. *Floriculture, Fundamentals and Practices*. Agrobios, India
- 5 Ramachandrappa and Nanjappa. *Fertigation Technology*, Agrobios, India
- 6 Prasad S and Kumar U. *Green House Management for Horticultural Crops*. Agrobios India
- 7 Prasad S and Kumar U. *Principles of Horticulture*. Agrobios India
- 8 <http://www.fao.org/3/a-i3284e.pdf>
- 9 [http://agritech.tnau.ac.in/agricultural\\_engineering/greenhouse.pdf](http://agritech.tnau.ac.in/agricultural_engineering/greenhouse.pdf)
- 10 <https://ag.umass.edu/sites/ag.umass.edu/files/book/pdf/greenhousebmpfb.pdf>

**Course Code: RUVGHM 402**

**Course Title : HARVESTING – II**

COURSE OUTCOME	CO DESCRIPTION
<b>CO 1</b>	Analyse the sub – harvest treatments to be given to a particular crop
<b>CO 2</b>	Learn the methods of harvesting
<b>CO 3</b>	Identify and design harvesting tools.

### DETAILED SYLLABUS

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
<b>RUVGHM 402</b>	I	<b>Scope of Harvesting Techniques</b> Crop physiology of fruit vegetable crops (cherry tomato and coloured capsicum) and flowering crops (Gerbera and carnation and Rose) Technology for sub-harvest treatments of vegetables. - Regime and techniques for irrigation (rain-making, drip irrigation, etc.), and influence of irrigation to quality of post-harvest products. - Fertilizer use: types and quality of fertilizers, correct ways of fertilizer application to ensure effectiveness, hygiene and food safety. - Use of plant protection products: types and quality of plant protection substances, correct ways of their application to ensure effectiveness, hygiene and food safety. Methods of harvesting. Harvesting tools and their design aspects.	1 credit, 9 Lectures
	II	<b>Postharvest Technology – II</b> Quality parameters of the above crops. Postharvest handling of above crops, Standard grades for cut flowers.	5 Lectures

	Post-Harvest System and Food losses- elements of post-harvest system, post - harvest loss. Traditional post-harvest storage systems commonly practiced.	
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### PRACTICALS

Code	Topics	Credits
<b>RUVGHMP 402</b>	<b>HARVESTING – II</b>	<b>3</b>
1	Study of maturity index and harvesting of cherry tomato	
2	Identification of different implements used for harvesting fruits	
3	Different Techniques of harvesting of vegetables	
4	Quality checking of greenhouse harvested vegetables	
5	Grading of greenhouse cultivated vegetables	
6	Study of the various factors for fixing the price of the crops grown in a greenhouse.	

### REFERENCES

- 1 <http://www.eagri.org/eagri50/HORT381/pdf/lec02.pdf>
- 2 Bose, T.K. and Som, T. K. 1986. Vegetable Crops in India. Naya Prakash, Kolkata.
- 3 Harvest year Book by Cris Peterson
- 4 [https://www.jica.go.jp/nepal/english/office/others/c8h0vm0000bjww96-att/tm\\_2.pdf](https://www.jica.go.jp/nepal/english/office/others/c8h0vm0000bjww96-att/tm_2.pdf)
- 5 <https://www.ccmgatx.org/media/19498/Harvesting-Vegetables.pdf>
- 6 [https://irrec.ifas.ufl.edu/postharvest/HOS\\_5085C/Reading%20Assignments/Kader-6-Maturation%20and%20Maturity%20Indices.pdf](https://irrec.ifas.ufl.edu/postharvest/HOS_5085C/Reading%20Assignments/Kader-6-Maturation%20and%20Maturity%20Indices.pdf)

**Course Code: RUVGHM 403**

**Course Title : ACCOUNTING- I**

COURSE OUTCOME	CO DESCRIPTION
CO 1	Understand the basic concepts of accounting.
CO 2	Maintain Journal and ledger documents.

### DETAILED SYLLABUS

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
<b>RUVGHM 403</b>	I	<b>Introduction to Accounting:</b> Need and Importance, Accounting principles, Generally accepted accounting principles, Double entry system- Principles of Double Entry system of Book Keeping- Advantages and disadvantages of Double entry system. Types /Classification of Accounts- Personal accounts – Real accounts - Nominal accounts - Fundamental rules of Debit and Credit Rules for Personal accounts – Real accounts- Nominal Accounts.	1 credit, 5 Lectures
	II	<b>Recording Transactions:</b> Journal - Meaning– importance - Simple entries- Journal – functions – importance - Types of Journal –General –	10 Lectures

	Special /Subsidiary Books (Cash Book, Purchase Day Book, Sales Day Book, Returns Inward Book, Returns Outward Book, Bills Receivable Book and Bills Payable Book). Ledger Accounts- Ledger Posting - General Ledger-Sub-Ledger (Customers' Ledger, Suppliers Ledger, Employees ledger)	
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### PRACTICALS

Code	Topics	Credits
<b>RUVGHMP 402</b>	<b>ACCOUNTING- I</b>	4
1	Journal entries	
2	Maintaining ledgers	
3	Control accounts	
4	Trial balances	
5	Preparation of financial statements	
6	Report	

### REFERENCES

- 1 <http://www.ddegjust.ac.in/studymaterial/bba/bba-104.pdf>
- 2 <http://ncert.nic.in/textbook/pdf/keac101.pdf>
- 3 Wayne Label book- Accounting for Non-Accountants, 3E: The Fast and Easy Way to Learn the Basics
- 4 <http://www.accsoft.ch/download/accountingconcepts.pdf>

**Course Code: RUVGHM 404**

**Course Title : MARKETING – I & SUPPLY CHAIN MANAGEMENT- I**

COURSE OUTCOME	CO DESCRIPTION
CO 1	Understand the basic concepts of accounting.
CO 2	Maintain Journal and ledger documents.

### DETAILED SYLLABUS

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
<b>RUVGHM 404</b>	I	<b>Marketing – I</b> Marketing - Nature, importance-scope-concepts of marketing – selling concept – modern concept- selling vs. Marketing – service marketing. Marketing Mix – (Product Mix - Price Mix - Place Mix -Promotion Mix) - Importance of marketing mix. Market Segmentation- meaning- bases- benefits – limitations – Requirements of effective segmentation – Market Targeting – strategies. Meaning- features- need and importance of study of consumer behavior- The Consumer Decision making Process – factors influencing consumer behavior- buying motives- - steps in buying decision making.	4 Credits, 30 Lectures

	II	<b>Supply Chain Management - I</b> Documentation, Technology used in supply chain management, Functions and Importance – Process – SCM Flows (Material, information/data, Money) – Flow Components (Transportation, Warehousing, Sourcing, Returns Management, Post Sales Service). SCM Strategies – Make Vs Buy – Push Vs. Pull	30 Lectures
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### PRACTICALS

Code	Topics	Credits
<b>RUVGHMP 404</b>	<b>MARKETING – I &amp; SUPPLY CHAIN MANAGEMENT- I</b>	<b>2</b>
1	Marketing of greenhouse crops cultivated by you.	
2	Supply chain management in relation to agriproduce and its uniqueness in perishability.	
3	Supply chain management in relation to agriproduce and its uniqueness in fragileness.	
4	Supply chain management in relation to agriproduce and its uniqueness in quality.	
5	Survey supply chain of greenhouse produce	
<b>RUVGHMP 405</b>	<b>Work Integrated Learning – II</b> (Internship –Working in a Hydrofarm)- 30 days	<b>8</b>

### REFERENCES

- 1 <http://www.accsoft.ch/download/accountingconcepts.pdf>
- 2 <http://cms.sinhgad.edu/media/365810/sample%20notes%20of%20basics%20of%20marketing.pdf>
- 3 <http://www.ddegjust.ac.in/studymaterial/pgdapr/pgdapr-105.pdf>
- 4 This Is Marketing: You Can't Be Seen Until You Learn to See Book by Seth Godin
- 5 The 22 Immutable Laws of Marketing Book by Al Ries and Jack Trout
- 6 [https://www.tutorialspoint.com/supply\\_chain\\_management/supply\\_chain\\_management\\_tutorial.pdf](https://www.tutorialspoint.com/supply_chain_management/supply_chain_management_tutorial.pdf)
- 7 [http://web.nchu.edu.tw/~pfsun/SCM/Wiki\\_SCM.pdf](http://web.nchu.edu.tw/~pfsun/SCM/Wiki_SCM.pdf)

**MODALITY OF ASSESSMENT****SEMESTER IV****Theory Examination Pattern****Internal Assessment - 40%****Paper I RUVGHM 401 - PROTECTED CULTIVATION - III**

Sr No	Evaluation type	Marks
1	Assignment /Projects /Photojournal /Case Studies	15
2	Assignment/ Research based Project/ Presentation	15
3	Maintenance of Greenhouse and Hydroponics Systems	20
<b>Total</b>		<b>50</b>

**Paper II RUVGHM 402 - HARVESTING - II**

Sr No	Evaluation type	Marks
1	Assignment / Model making / Presentation/ Survey	10
2	Assignment / Presentation	10
<b>Total</b>		<b>20</b>

**Paper III RUVGHM403 - ACCOUNTING - I**

Sr No	Evaluation type	Marks
1	Assignment/ Project	20
2	Assignment/ Project/ Presentation	20
<b>Total</b>		<b>40</b>

**Paper IV RUVGHM404 - MARKETING – I& SUPPLY CHAIN MANAGEMENT-I**

Sr No	Evaluation type	Marks
1	Assignment / Project/ Survey/ Presentation based on Marketing	20
2	Assignment / Project/ Survey/ Presentation/ Report based on Marketing	20
3	Assignment / Project/ Survey/ Presentation/ Report based on	20



	Supply Chain Management	
4	Assignment / Project/ Survey/ Presentation/ Report based on Supply Chain Management	20
<b>Total</b>		<b>80</b>

### Semester End Theory Assessment

#### Paper I RUVGHM 401 - PROTECTED CULTIVATION - III

Questions	Options	Marks	Questions on
Q1	Any 5 out of 7	30	Unit I
Q.2	Any 5 out of 7	30	Unit II
<b>Total</b>		<b>60</b>	

#### Paper II RUVGHM 402 - HARVESTING - II

Questions	Options	Marks	Questions on
Q1	Any 5 out of 7	15	Unit I
Q.2	Any 5 out of 7	15	Unit II
<b>Total</b>		<b>30</b>	

#### Paper III RUVGHM403 - ACCOUNTING - I

Questions	Options	Marks	Questions on
Q1	Any 5 out of 7	30	Unit I
Q.2	Any 5 out of 7	30	Unit II
<b>Total</b>		<b>60</b>	

**Paper IV RUVGHM404 - MARKETING – I & SUPPLY CHAIN MANAGEMENT- I**

Questions	Options	Marks	Questions on
Q1	Any 6 out of 8	36	Unit I
Q.2	Any 6 out of 8	36	Unit II
Q3	Any 6 out of 8	36	Unit I & Unit II
Q4	Any 4 out of 6	12	Unit I & Unit II
<b>Total</b>		<b>120</b>	

**Practical Examination Pattern:****A) Internal Examination: 40%****Paper I RUVGHMP 401 - PROTECTED CULTIVATION - III**

Sr No	Evaluation type	Marks
1	Assignment / Project/ Model making / Case Study	20
2	Assignment / Project/ Model making / Case Study	20
3	Assignment / Project/ Presentation	20
4	Maintenance of greenhouse and hydroponics systems	20
<b>Total</b>		<b>80</b>

**Paper II RUVGHMP 402 - HARVESTING - II**

Sr No	Evaluation type	Marks
1	Assignment /Project/ Model making	20
2	Assignment / Project/ Case Study	20
3	Presentation / Model making	20
<b>Total</b>		<b>60</b>

**Paper III RUVGHMP 403 - ACCOUNTING – I**

Sr No	Evaluation type	Marks
1	Assignment / Project	30
2	Quiz / Open Book test	30
3	Case Study	20
<b>Total</b>		<b>80</b>

**Paper IV RUVGHMP 404 - MARKETING – I& SUPPLY CHAIN MANAGEMENT- I**

Sr No	Evaluation type	Marks
1	Assignment/ Project/ Survey/ Case Study/ Role Play	20
2	Assignment/ Project/ Survey/ Case Study	20
<b>Total</b>		<b>40</b>

**B) External Examination: 60%**

**Semester End Practical Examination:**

**Paper I RUVGHMP 401 - PROTECTED CULTIVATION - III**

Particulars	Paper
Experiments	90
Reports	10
Viva	10
Journal	10
<b>Total</b>	<b>120</b>

**Paper II RUVGHMP 402 - HARVESTING – II**

<b>Particulars</b>	<b>Paper</b>
Experiments	70
Viva	10
Journal	10
<b>Total</b>	<b>90</b>

**Paper III RUVGHMP 403 - ACCOUNTING - I**

<b>Particulars</b>	<b>Paper</b>
Experiments	90
Viva	10
Journal	10
<b>Total</b>	<b>120</b>

**Paper IV, RUVGHMP 404 - MARKETING – I& SUPPLY CHAIN MANAGEMENT- I**

<b>Particulars</b>	<b>Paper</b>
Experiments	40
Viva	10
Journal	10
<b>Total</b>	<b>60</b>

### Overall Examination & Marks Distribution Pattern

#### THEORY

Paper code	Paper name	Total marks	Internal marks	External marks	Time	Credits
RUVGHM 401	Protected Cultivation – III	100	40	60	2 hrs	02
RUVGHM 402	Harvesting - II	50	20	30	1 hr	01
RUVGHM 403	Accounting- I	100	40	60	2 hrs	02
RUVGHM 404	Marketing – I& Supply Chain Management- I	200	80	120	3 ½ hrs	04
<b>Total</b>		<b>450</b>				

#### PRACTICALS

Paper code	Paper name	Total marks	Internal marks	External marks	Credits
RUVGHM P401	Protected Cultivation – III	200	80	120	04
RUVGHM P402	Harvesting - II	150	60	90	03
RUVGHM P403	Accounting- I	200	80	120	04
RUVGHM P204	Marketing – I& Supply Chain Management- I	100	40	60	02
RUVGHMP 405	Work Integrated Learning – II (Internship -greenhouse/polyhouse design and structures, maintenance of greenhouse, trouble shooting)	<b>400</b>	<b>Passing</b> <b>200</b>	<b>08</b>	
<b>Total</b>		<b>1050</b>			

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**SEMESTER V****Course Code: RUVGHM 501****Course Title : SOIL AND WATER MANAGEMENT – III****ACADEMIC YEAR 2020-21**

<b>COURSE OUTCOME</b>	<b>CO DESCRIPTION</b>
<b>CO 1</b>	Sterilize and reclaim the soil of a greenhouse and manipulate as per the crop requirement.
<b>CO 2</b>	Install and maintain sprinkler irrigation system.
<b>CO 3</b>	Suggest an appropriate irrigation system for a given crop, site and climatic condition.

**DETAILED SYLLABUS**

<b>Course Code/ Unit</b>	<b>Unit</b>	<b>Course/ Unit Title</b>	<b>Credits/ Lectures</b>
<b>RUVGHM501</b>	<b>I</b>	<b>Soil management</b> Adverse Effect of use of fertilizers / pesticides in soil, soil pollution, Reclamation of soil. Soil health and generation of soil health card. Improvement of soil fertility and health by using soil organisms/microorganisms.	2 credits, 15 Lectures
	<b>II</b>	<b>Water management</b> Installation of sprinkler irrigation system, maintenance of sprinkler irrigation system, Sprinkler Irrigation Output Calculations, Benefits. Fertigation systems Injectors and plumbing; Controlling pH, EC, and pathogens, Micro-irrigation. Determining fertilizer rates, Chemigation	15 Lectures

**PRACTICALS**

<b>Code</b>	<b>Topics</b>	<b>Credits</b>
<b>RUVGHM 501</b>	<b>SOIL AND WATER MANAGEMENT – III</b>	<b>4</b>
<b>1</b>	Study about soil health card	
<b>2</b>	To determine the water percolation rate of the given piece of land.	
<b>3</b>	Indoor hydroponics using LED system	
<b>4</b>	Improvement of soil fertility and health by using soil organisms/microorganisms.	
<b>5</b>	Installation of sprinkler irrigation system,	
<b>6</b>	Maintenance of sprinkler irrigation system	
<b>7</b>	Units of Water Measurement Benefits in sprinkler system	
<b>8</b>	Sprinkler Irrigation Output Calculations	

### REFERENCES

- 1 <http://www.fao.org/3/a-bl831e.pdf>
- 2 Biswas T D and Mukherjee S K .*Text Book of Soil Science* by, Tata McGraw-Hill Publishing Company Limited.
- 3 Prasad S and Kumar U 2003. Greenhouse management of horticultural crops. 2 Agrobios.
- 4 Principles of drip irrigation system, Dr. M.S. Mane, B.L.Ayare, Dr. S.S.Magar., New Delhi
- 5 Principles of sprinkler irrigation, Dr. M.S. Mane ,Dr.B.L. Ayare. Jain Bros., New Delhi
- 6 Tisdale and Nelson, book – soil fertility and fertilizers.
- 7 Eric lichtfouse-sustainable agriculture reviews-1-organic farming pest control and remediation of soil pollutants-springer publication-ebook
- 8 [http://nmsp.cals.cornell.edu/publications/extension/NRCCA\\_Manual\\_Soil\\_and\\_Water\\_10\\_26\\_2016.pdf](http://nmsp.cals.cornell.edu/publications/extension/NRCCA_Manual_Soil_and_Water_10_26_2016.pdf)
- 9 Ramachandrappa and Nanjappa. *Fertigation Technology*, Agrobios, India
- 10 Prasad S and Kumar U. *Green House Management for Horticultural Crops*. Agrobios India
- 11 Biswas T D and Mukherjee S K .*Text Book of Soil Science* by, Tata McGraw-Hill Publishing Company Limited.

**Course Code: RUVGHM 502**

**Course Title : INTEGRATED NUTRIENT MANAGEMENT – III**

COURSE OUTCOME	CO DESCRIPTION
CO 1	Choose appropriate inorganic and organic fertilizer for any given crop
CO 2	Carry out organic cultivation of vegetables
CO 3	Prepare organic fertilizers, fungicides, insecticides and pesticides

### DETAILED SYLLABUS

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
RUVGHM502	I	<b>Plant nutrition and Fertilizers</b> <b>Types of Fertilizers:</b> Straight fertilizers, Complex fertilizers, Mixed fertilizers, Nitrogenous (Ammonium sulphate, Urea, Calcium nitrate), Phosphatic (Superphosphate, Bone meal), Potassic (Muriate of Potash, Potassium sulphate), Neem coated urea, muriate of potash, Solid and Liquid fertilizers - Physical and Chemical properties of fertilizers, Different fertilizer grades for macro and micro elements , Methods of Fertilizer application: Broadcasting, Placement, Pellet application, Starter solutions, Foliar application, (Fertigation), Soil Injection and Aerial application. Unit value calculation of fertilizer and its dosage Calculations for different greenhouse crops	1 credit, 15 Lectures
	II	<b>Principles, Methods and Advantages of Organic</b>	

	<p><b>cultivation</b>          Principles, practices and importance in modern crop production, Types of organic farming, Planting, managing soil quality, Weed Management, diseases and pest management ,Organic Fertilizers: Advantages and inconveniences of organic fertilizers, Naturally occurring organic fertilizers: Manures, Slurry, Worm castings, Peat, Seaweed, Humic Acid, Guano, Sewage, Sludges, Production of organic Fertilizers: Compost, Blood meal, Bone meal, Humic acid, Sea weed extracts, Natural enzyme digested proteins- Fish meal, Feather meal, Decomposing Crop residue (Green Manure), Vermicompost          Organic Pesticides: Types of Organic pesticides, Homemade Organic pesticides, Bio pesticides          Cultivation of green fillers plants (Dracaena, Palm etc),          Cultivation of foliage filler plants</p>	15 Lectures
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### PRACTICALS

Code	Topics	Credits
<b>RUVGHMP 502</b>	<b>INTEGRATED NUTRIENT MANAGEMENT – III</b>	<b>3</b>
<b>1</b>	Identification of the effect of excess of nutrients on plants	
<b>2</b>	Unit value calculation of fertilizer	
<b>3</b>	Dosage calculation for Fertigation	
<b>4</b>	Preparation of two organic fertilizer	
<b>5</b>	Preparation of inorganic fertilizer	

### REFERENCES

- 1 [http://lavsodisha.org/downloads/training\\_module/INM.pdf](http://lavsodisha.org/downloads/training_module/INM.pdf)
- 2 <https://repositorio.iica.int/bitstream/handle/11324/4188/BVE17089202i.pdf>
- 3 <https://www.nap.edu/read/18674/chapter>
- 4 Pradeepkumar T, Suma B, Jyothibhaskar & Satheesan KN. 2007. *Management of Horticultural Crops*. Parts I, II by New India Publications.
- 5 Dharma Abrol-Integrated Pest Management-1<sup>st</sup> Edition-By current concepts and ecological prospective.
- 6 Ram Singh & Vikas Jindal G.S. Dhaliwal-book- A Textbook of Integrated Pest Management Paperback – 1 January 2013
- 7 <https://agrimoon.com/wp-content/uploads/Insect-Ecology-Integrated-Pest-Management.pdf>



**Course Code: RUVGHM 503****Course Title : PROTECTED CULTIVATION – IV**

COURSE OUTCOME	CO DESCRIPTION
CO 1	Cultivate cut flowers in greenhouse
CO 2	Micropropagate greenhouse and ornamental plants
CO 3	Carry out indoor hydroponics using natural and artificial lights.

**DETAILED SYLLABUS**

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
RUVGHM503	I	<b>Greenhouse Cultivation</b> Greenhouse cultivation of fruit (Peach & Nectarine, Raspberry,)/ flower (Orchid and <i>Anthurium</i> ). Bed preparation in greenhouse for fruit (exotic)/ flower ( <i>Anthurium</i> ), growing media of orchid, conditions, maintenance of orchid. Indoor hydroponics using LED system	1 credit, 7 Lectures
	II	<b>Micropropagation</b> - Micropropagation of greenhouse flowering plants. In-vitro micrografting.	8 Lectures

**PRACTICALS**

Code	Topics	Credits
RUVGHMP 503	<b>PROTECTED CULTIVATION – IV</b>	3
1	Cultivation of flowering ( <i>Lilium</i> and <i>Chrysanthemum</i> ) plants in green house	
2	Cultivation of fruit (zucchini and Broccoli) crops in greenhouse	
3	Micropropagation of greenhouse flowering plants	
4	Identification of popular varieties of greenhouse flowering crops.	
5	Identification of common garden plants, vegetable crops and spice crops	
6	Safety and hygiene to be maintained in a greenhouse.	

**REFERENCES**

- [http://krishi.icar.gov.in:8080/jspui/bitstream/123456789/5381/1/Technical%20Bulletin\\_Protected%20Cultivation%20in%20Horticultural%20Crops.pdf](http://krishi.icar.gov.in:8080/jspui/bitstream/123456789/5381/1/Technical%20Bulletin_Protected%20Cultivation%20in%20Horticultural%20Crops.pdf)
- Pant V, Nelson. 1991. *Green House Operation and Management*. Bali Publ.
- UCSC Farm & Garden Apprenticeship- S Edited by Martha Brown, Jan Perez, and Albie Miles 3RD EDITION Revised & Expanded Teaching Organic Farming & Gardening
- <https://casfs.ucsc.edu/about/publications/Teaching-Organic-Farming/PDF-downloads/TOFG-all.pdf>
- Alex Lauric and Victor h Ries. *Floriculture, Fundamentals and Practices*. Agrobios, India

- 6 Ramachandrappa and Nanjappa. *Fertigation Technology*, Agrobios, India
- 7 Prasad S and Kumar U. *Green House Management for Horticultural Crops*. Agrobios India
- 8 Prasad S and Kumar U. *Principles of Horticulture*. Agrobios India.
- 9 <http://www.fao.org/3/a-i3284e.pdf>
- 10 [http://agritech.tnau.ac.in/agricultural\\_engineering/greenhouse.pdf](http://agritech.tnau.ac.in/agricultural_engineering/greenhouse.pdf)
- 11 <https://ag.umass.edu/sites/ag.umass.edu/files/book/pdf/greenhousebmpfb.pdf>
- 12 Introduction to plant tissue culture Book by M. K. Razdan
- 13 Plants from Test Tubes: An Introduction to Micropropagation book
- 14 Experiments in plant tissue culture Book by John Dodds
- 15 [https://www.bjcancer.org/Sites\\_OldFiles/\\_Library/UserFiles/pdf/Introduction%20to%20Cell%20and%20Tissue%20Culture.pdf](https://www.bjcancer.org/Sites_OldFiles/_Library/UserFiles/pdf/Introduction%20to%20Cell%20and%20Tissue%20Culture.pdf)

**Course Code: RUVGHM 504**

**Course Title : POST HARVEST MANAGEMENT AND VALUE ADDITION**

COURSE OUTCOME	CO DESCRIPTION
CO 1	Make fresh and dried flower arrangement
CO 2	Prepare flower preservatives.
CO 3	Knowledge of different types of packaging materials
CO4	Acquire the skill of packing, storing, grading.
CO5	Read and understand various labels on fruits and vegetables

**DETAILED SYLLABUS**

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
RUVGHM504	I	<b>Post Harvest Handling of cut flowers, fruits and vegetables</b> - Post-harvest handling, Methods of grading, packaging, cooling storage conditions/environmental requirements and treatments. Cut fruits and vegetables -. extraction, vaccum package, storage period, attractive packaging. Prepare postharvest standard operating procedures for fruits and vegetables production in accordance with FSMA. Value Added Products - Fresh Flower arrangements (Indian, Japanese and western styles), Drying techniques, Dry Flower arrangement, Dry flower products. Food processing Industry.	1 Credit, 7 Lectures
	II	<b>Principals of food preservation</b> – Basic principles and methods of preservation of fruits and vegetables, Causes of postharvest deterioration and its prevention or minimize deterioration. Methods of improving the shelf life of fruits and vegetables, prolonging the vase life of cut flowers, Adulterants/chemicals used for promoting the shelf life and attractive colours of fruits and vegetables. Transportation &	8 Lectures

		Packaging - Methods of packing and transport of cut flowers, fruits and vegetables to market, Labelling of the packaged cut flowers, fruits and vegetables. Packaging of exotic flavouring agents. Safety measures: Describe legal regulation pertaining to workplace, control of substance hazardous to health, handling, storage and disposal of waste etc	
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### PRACTICALS

Code	Topics	Credits
<b>RUVGHMP 504</b>	<b>POST HARVEST MANAGEMENT AND VALUE ADDITION</b>	<b>3</b>
<b>1</b>	To access the quality of the given fruit/ vegetable using refractometer	
<b>2</b>	To study the various methods of packing of flowers, fruits and vegetables	
<b>3</b>	To increase the shelf life of the given cut flower, fruits and vegetables	
<b>4</b>	To test for different adulterants in fruits, vegetables and their products	
<b>5</b>	Ikebana - Moribana	
<b>6</b>	Safety and hygiene to be maintained during packing and transporting flower, fruits and vegetables.	

### REFERENCES

- 1 P.H. Pandey Sadhna Pandey, S.N. Pandey (Author)
- 2 [https://irrec.ifas.ufl.edu/postharvest/hos\\_5085c/reading%20assignments/kader-6-maturation%20and%20maturity%20indices.pdf](https://irrec.ifas.ufl.edu/postharvest/hos_5085c/reading%20assignments/kader-6-maturation%20and%20maturity%20indices.pdf)
- 3 <http://www.eagri.org/eagri50/hort381/pdf/lec02.pdf>
- 4 [http://www.hillagric.ac.in/edu/coa/vegetables/lectures/vsf\\_473\\_flori/vsf\\_473\\_lect\\_1\\_2\\_pht.pdf](http://www.hillagric.ac.in/edu/coa/vegetables/lectures/vsf_473_flori/vsf_473_lect_1_2_pht.pdf)
- 5 <https://agrimoon.com/wp-content/uploads/protected-cultivation-post-harvest-technology.pdf>
- 6 Post-Harvest Pathology: Plant Pathology In The 21st Century, Contributions To The 10th International Congress, Icpp 2013
- 7 Postharvest Technology And Engineering: Book By Dev Raj

**Course Code: RUVGHM 505**

**Course Title : MANAGERIAL SKILLS – III**

COURSE OUTCOME	CO DESCRIPTION
<b>CO 1</b>	Enhance the communication skills required for business building.
<b>CO 2</b>	Develop business management skills.
<b>CO 3</b>	Understand corporate social responsibility.

**DETAILED SYLLABUS**

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
RUVGHM505	I	<b>Human Resources Management</b> Building relationship skills for developing positive interpersonal communication, importance of supportive communication, coaching and counselling, defensiveness and disconfirmation, principles of supportive communication, Personal interview management, skill analysis and application on above areas.	2 Credits, 15 Lectures
	II	<b>Business Ethics</b> Business ethics, Corporate Social Responsibility	15 Lectures

**PRACTICALS**

Code	Topics	Credits
RUVGHMP 505	<b>MANAGERIAL SKILLS – III</b>	2
1	Case study	
2	Role play based on a given skit	
3	Role play based on business ethics	
4	Interview management	
5	Corporate social responsibility.	

**REFERENCES**

- 1 <http://rccmindore.com/wp-content/uploads/2015/06/Managerial-SkillsAll-Units-AC.pdf>
- 2 <https://2012books.lardbucket.org/books/an-introduction-to-business-v1.0/s10-06-managerial-skills.html>
- 3 [https://www.ippr.org/files/publications/pdf/business-skills\\_Nov2016.pdf](https://www.ippr.org/files/publications/pdf/business-skills_Nov2016.pdf)
- 4 Basic Managerial Skills for All Book by E. H. McGrath
- 5 Managerial Skills Book by Alex K

**Course Code: RUVGHM 506****Course Title : MARKETING - II & SUPPLY CHAIN MANAGEMENT - II**

COURSE OUTCOME	CO DESCRIPTION
CO 1	Enhance the communication skills required for business building.
CO 2	Develop business management skills.
CO 3	Understand corporate social responsibility.

**DETAILED SYLLABUS**

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
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<b>RUVGHM506</b>	I	<b>Marketing</b> <b>Market Research</b> - process -merits – techniques and tools of data collection- problems or limitations, Product Planning and development – new product development stages, Product life cycle – strategies, Branding- factors influencing branding- strategies.	4 Credits, 30 Lectures
	II	<b>Supply Chain Management - II</b> Role of Information Technology in SCM- Impact of Internet and E-Business – IT enabled SCM, Future of SCM, SCM networks- The new Manufacturing and Distribution Practices in the light of Globalized Economy – Local and International Supply Chains – Outsourcing – Inventory Management. Value chain management.	30 Lectures

### PRACTICALS

Code	Topics	Credits
<b>RUVGHMP 506</b>	<b>MARKETING - II &amp; SUPPLY CHAIN MANAGEMENT - II</b>	4
1	Transportation and export -Documentation	
2	Transportation and export- Custom clearance	
3	Transportation and export- Billing	
4	Survey wholesale vegetable market to study the supply chain	
5	Survey wholesale flower market to study the supply chain	
6	Survey wholesale fish market to study the supply chain	

### REFERENCES

- 1 <http://www.nitc.ac.in/app/webroot/img/upload/Supply%20Chain%20Management%20-%20Note.pdf>
- 2 [http://ebooks.lpude.in/management/mba/term\\_4/DMGT523\\_LOGISTICS\\_AND\\_SUPPLY\\_CHAIN\\_MANAGEMENT.pdf](http://ebooks.lpude.in/management/mba/term_4/DMGT523_LOGISTICS_AND_SUPPLY_CHAIN_MANAGEMENT.pdf)
- 3 <http://www.accsoft.ch/download/accountingconcepts.pdf>
- 4 <http://cms.sinhgad.edu/media/365810/sample%20notes%20of%20basics%20of%20marketing.pdf>
- 5 <http://www.ddegjust.ac.in/studymaterial/pgdapr/pgdapr-105.pdf>
- 6 This Is Marketing: You Can't Be Seen Until You Learn to See Book by Seth Godin
- 7 The 22 Immutable Laws of Marketing Book by Al Ries and Jack Trout
- 8 [https://www.tutorialspoint.com/supply\\_chain\\_management/supply\\_chain\\_management\\_tutorial.pdf](https://www.tutorialspoint.com/supply_chain_management/supply_chain_management_tutorial.pdf)
- 9 [http://web.nchu.edu.tw/~pfsun/SCM/Wiki\\_SCM.pdf](http://web.nchu.edu.tw/~pfsun/SCM/Wiki_SCM.pdf)

**MODALITY OF ASSESSMENT****SEMESTER V****Internal Assessment - 40%****Paper I RUVGHM 501 - SOIL AND WATER MANAGEMENT – III**

Sr No	Evaluation type	Marks
1	Assignment/ Project	20
2	Case Study / Presentation	20
<b>Total</b>		<b>40</b>

**Paper II RUVGHM 502 - INTEGRATED NUTRIENT MANAGEMENT –III**

Sr No	Evaluation type	Marks
1	Assignment/ Research based Project/ Presentation	10
2	Presentation/ Case Study	10
<b>Total</b>		<b>20</b>

**Paper III RUVGHM 503 - PROTECTED CULTIVATION – III**

Sr No	Evaluation type	Marks
1	Assignment / Project	10
2	Maintenance of Greenhouse	10
<b>Total</b>		<b>20</b>

**Paper IV RUVGHM 504 - POST HARVEST MANAGEMENT AND VALUE ADDITION**

Sr No	Evaluation type	Marks
1	Assignment	10
2	Presentation	10
<b>Total</b>		<b>20</b>

**Paper V RUVGHM 505 - MANAGERIAL SKILLS - III**

Sr No	Evaluation type	Marks
1	Assignment / Project / Presentation	20
2	Assignment / Project / Presentation	20
<b>Total</b>		<b>40</b>

**Paper VI RUVGHM 506 - MARKETING – II & SUPPLY CHAIN MANAGEMENT - II**

Sr No	Evaluation type	Marks
1	Assignment / Project / Presentation/ Case Study/ Survey for Managerial Skills	20
2	Assignment / Project / Presentation/ Case Study/ Survey for Managerial Skills	20
3	Assignment / Project / Presentation/ Case Study/ Survey for Supply Chain Management	20
4	Assignment / Project / Presentation/ Case Study/ Survey for Supply Chain Management	20
<b>Total</b>		<b>80</b>

**Semester End Theory Assessment****Paper I RUVGHM 501 - SOIL AND WATER MANAGEMENT – III**

Questions	Options	Marks	Questions on
Q1	Any 5 out of 7	15	Unit I
Q.2	Any 5 out of 7	15	Unit II
Q.3	Any 5 out of 7	30	Unit I & II
<b>Total</b>		<b>60</b>	

**PAPER II - RUVGHM 502 - INTEGRATED NUTRIENT MANAGEMENT –III**

Questions	Options	Marks	Questions on
Q1	Any 5 out of 7	15	Unit I
Q.2	Any 5 out of 7	15	Unit II
<b>Total</b>		<b>30</b>	

**Paper III RUVGHM 503 - PROTECTED CULTIVATION – III**

Questions	Options	Marks	Questions on
Q1	Any 5 out of 7	15	Unit I
Q.2	Any 5 out of 7	15	Unit II
<b>Total</b>		<b>30</b>	

**Paper IV RUVGHM 504 - POST HARVEST MANAGEMENT AND VALUE ADDITION**

Questions	Options	Marks	Questions on
Q1	Any 5 out of 7	15	Unit I
Q.2	Any 5 out of 7	15	Unit II
<b>Total</b>		<b>30</b>	

**Paper V RUVGHM 505 - MANAGERIAL SKILLS - III**

Questions	Options	Marks	Questions on
Q1	Any 6 out of 8	36	Unit I
Q.2	Any 6 out of 8	24	Unit II
<b>Total</b>		<b>60</b>	

**Paper VI RUVGHM 506 - MARKETING – II & SUPPLY CHAIN MANAGEMENT - II**

Questions	Options	Marks	Questions on
Q1	Any 6 out of 8	36	Unit I
Q.2	Any 6 out of 8	36	Unit II
Q3	Any 6 out of 8	36	Unit I & Unit II



Q4	Any 4 out of 6	12	Unit I & Unit II
<b>Total</b>		<b>120</b>	

**Practical Examination Pattern:****A) Internal Examination: 40%****Paper I RUVGHMP 501 - SOIL AND WATER MANAGEMENT – III**

Sr No	Evaluation type	Marks
1	Assignment / Research based project/ Model making/ Survey	30
2	Assignment / Project/ Survey	30
3	Presentation	20
<b>Total</b>		<b>80</b>

**PAPER II RUVGHMP 502 - INTEGRATED NUTRIENT MANAGEMENT –III**

Sr No	Evaluation type	Marks
1	Assignment / Project / Survey	20
2	Assignment / Calculations	20
3	Presentation	20
<b>Total</b>		<b>60</b>

**Paper III RUVGHMP 503 - PROTECTED CULTIVATION – III**

Sr No	Evaluation type	Marks
1	Assignment / Project/ Case Study/ Model making	20
2	Assignment / Project/ Case Study/ Visits	20
3	Maintenance of Greenhouse	20
<b>Total</b>		<b>60</b>

**Paper IV RUVGHMP 504 - POST HARVEST MANAGEMENT AND VALUE  
ADDITION**

Sr No	Evaluation type	Marks
1	Assignment/ Project/Survey/ Case Study	20
2	Assignment/ Project/Survey/ Case Study	20
3	Assignment/ Project/Survey/ Case Study/ Presentation/ Visits	20
<b>Total</b>		<b>60</b>

**Paper V RUVGHMP 505 - MANAGERIAL SKILLS - III**

Sr No	Evaluation type	Marks
1	Assignment/ Project/Survey/ Case Study/ Role Play	20
2	Assignment/ Project/Survey/ Case Study/ Presentation	20
<b>Total</b>		<b>40</b>

**Paper VI RUVGHMP 506 - MARKETING – II & SUPPLY CHAIN MANAGEMENT - II**

Sr No	Evaluation type	Marks
1	Assignment/ Project/Survey/ Case Study	30
2	Assignment/ Project/Survey/ Case Study	30
3	Presentation	20
<b>Total</b>		<b>80</b>

**B) External Examination: 60%**

**Semester End Practical Examination:**

**Paper I RUVGHMP 501 - SOIL AND WATER MANAGEMENT – III**

Particulars	Paper
Experiments	90
Reports	10
Viva	10

Journal	10
<b>Total</b>	<b>120</b>

**PAPER II RUVGHMP 502 - INTEGRATED NUTRIENT MANAGEMENT –III**

Particulars	Paper
Experiments	70
Viva	10
Journal	10
<b>Total</b>	<b>90</b>

**Paper III RUVGHMP 503 - PROTECTED CULTIVATION – III**

Particulars	Paper
Experiments	70
Viva	10
Journal	10
<b>Total</b>	<b>90</b>

**Paper IV RUVGHMP 504 - POST HARVEST MANAGEMENT AND VALUE****ADDITION**

Particulars	Paper
Experiments	70
Viva	10
Journal	10
<b>Total</b>	<b>90</b>

**Paper V RUVGHMP 505 - MANAGERIAL SKILLS – III**

Particulars	Paper
Experiments	40
Viva	10
Journal	10
<b>Total</b>	<b>60</b>

**Paper VI RUVGHMP 506 - MARKETING – II & SUPPLY CHAIN MANAGEMENT - II**

Particulars	Paper
Experiments	100
Viva	10
Journal	10
<b>Total</b>	<b>120</b>

### Overall Examination & Marks Distribution Pattern

#### THEORY

Paper code	Paper name	Total marks	Internal marks	External marks	Time	Credits
RUVGHM 501	Soil and Water Management – III	100	40	60	2 hrs	02
RUVGHM 502	Integrated Nutrient Management – III	50	20	30	1 hr	01
RUVGHM 503	Protected Cultivation – IV	50	20	30	1 hr	01
RUVGHM 504	Post Harvest Management and Value Addition	50	20	30	1 hr	01
RUVGHM 505	Managerial Skills - III	100	40	60	2 hrs	02
RUVGHM 506	Marketing – II & Supply Chain Management - II	200	80	120	3 ½ hrs	04
<b>Total</b>		<b>550</b>				

#### PRACTICALS

Paper code	Paper name	Total marks	Internal marks	External marks	Credits
RUVGHM P 501	Soil and Water Management – III	200	80	120	4
RUVGHM P 502	Integrated Nutrient Management – III	150	60	90	3
RUVGHM P 503	Protected Cultivation – IV	150	60	90	3
RUVGHM P 504	Post Harvest Management and Value Addition	150	60	90	3
RUVGHMP 505	Managerial Skills – III	100	40	60	2
RUVGHMP 506	Marketing – II & Supply Chain Management – II	200	80	120	4
<b>Total</b>		<b>950</b>			

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## SEMESTER VI

Course Code: RUVGHM 601

Course Title : PROTECTED CULTIVATION – V

ACADEMIC YEAR 2020-21

COURSE OUTCOME	CO DESCRIPTION
CO 1	Cultivate vegetable and flower crop in a polyhouse or in the open field (small scale).
CO 2	Manage a greenhouse.
CO3	Set up / help set up a hydrofarm and standardise the parameters for soilless cultivation.
CO4	Advice on or carry out, post – harvest activities, like harvesting, sorting, grading, packaging , storing, labelling and transportation of the produce.
CO5	Work in a plant tissue culture laboratory/ organisation.

## DETAILED SYLLABUS

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
RUVGHM 601	I	<b>Cultivation of cut flowers, fruits and vegetables</b> Greenhouse cultivation of vegetable (Zucchini, Broccoli)/ flower ( <i>Chrysanthemum</i> and <i>Lilium</i> ). Bed preparation in greenhouse for above mentioned fruit and flower crop. Medicinal cultivation in . Pot cultivation of ornamentals	2 Credits, 15 Lectures
	II	<b>Basic Management in a greenhouse</b> Greenhouse general management, Pest & Disease management, Environment management, Irrigation management & Hygiene management. Documents, loans, subsidy	15 Lectures

## PRACTICALS

Code	Topics	Credits
RUVGHMP 601	PROTECTED CULTIVATION – V	6
1	Cultivation of flowering plants /fruit crops/ vegetables in green house	
2	Development of mobile application for monitoring pests and diseases	
3	Bending of roses	
4	Disbudding of Roses	
5	Trellising of cucurbits, tomato	
6	Staking of plants	
7	Netting of carnation	
8	Preparation of a crop rotation chart of crops grown in a greenhouse	
9	Technique of spraying of pesticide	

## REFERENCES

- 1 <http://www.fao.org/3/a-i6787e.pdf>
- 2 Pant V, Nelson. 1991. *Green House Operation and Management*. Bali Publ.
- 3 UCSC Farm & Garden Apprenticeship- S Edited by Martha Brown, Jan Perez, and Albie Miles 3RD EDITION Revised & Expanded Teaching Organic Farming & Gardening
- 4 <https://casfs.ucsc.edu/about/publications/Teaching-Organic-Farming/PDF-downloads/TOFG-all.pdf>
- 5 Alex Lauric and Victor h Ries. *Floriculture, Fundamentals and Practices*. Agrobios, India
- 6 Ramachandrappa and Nanjappa. *Fertigation Technology*, Agrobios, India
- 7 Prasad S and Kumar U. *Green House Management for Horticultural Crops*. Agrobios India
- 8 Prasad S and Kumar U. *Principles of Horticulture*. Agrobios India.
- 9 <http://www.fao.org/3/a-i3284e.pdf>
- 10 [http://agritech.tnau.ac.in/agricultural\\_engineering/greenhouse.pdf](http://agritech.tnau.ac.in/agricultural_engineering/greenhouse.pdf)
- 11 <https://ag.umass.edu/sites/ag.umass.edu/files/book/pdf/greenhousebmpfb.pdf>

Ramnarain Ruia Autonomous College

**Course Code: RUVGHM 602**

**Course Title : ACCOUNTING – II**

COURSE OUTCOME	CO DESCRIPTION
CO 1	Keep records of the business.
CO 2	Cross check the journals and ledgers.
CO 3	Knowledge of the laws of taxation applicable.
CO4	Knowledge about auditing.

**DETAILED SYLLABUS**

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
RUVGHM 602	I	<b>Cash Book (single column, double column and three column)</b> Bill of Exchange: Meaning – Definition – Importance, Promissory Note – Recording bill transaction (honoring, dishonoring, discounting). Accounting for Depreciation: Meaning, Importance, Methods of providing depreciation (straight line, diminishing, annuity), Reserves and Provisions, Introduction to Final accounts of Sole Traders: Manufacturing, Trading, and Profit and Loss Account and Balance Sheet , Assets - Current Assets- Tangible assets – (equipment – building – stock –cash)- Intangible assets – goodwill –trademarks – patents, Liabilities – Current Liabilities – Loans- Accounts Payable –accrued expenses, Equity – Shareholders loans – capital stock – retained earnings, Net worth –meaning and importance -Importance of balance sheet.	3 Credits,  22 Lectures
	II	<b>Introduction to Income statements</b> Introduction to income statement terms( revenue, operating Expenses, operating income, net income- net profit before tax – net profit after tax) – Purpose and importance of income statements , Ratio Analysis- Ratio Analysis – Meaning and definition- Balance Sheet Ratios- Current Ratio - Liquid Ratio - Debt Equity Ratio- Revenue Statement Ratios - Gross Profit Ratio - Net Profit Ratio	22 Lectures

**PRACTICALS**

Code	Topics	Credits
RUVGHMP 602	<b>ACCOUNTING – II</b>	3
1	Managing Finance	
2	Taxation	
3	Audit	

### REFERENCES

- 1 Accounting All-in-One For Dummies Book by Kenneth W. Boyd and Lita Epstein
- 2 Financial Shenanigans: How to Detect Accounting Gimmicks & Fraud in Financial Reports, book
- 3 <http://www.ddegjust.ac.in/studymaterial/bba/bba-104.pdf>
- 4 <http://ncert.nic.in/textbook/pdf/keac101.pdf>
- 5 Wayne Label book- Accounting for Non-Accountants, 3E: The Fast and Easy Way to Learn the Basics
- 6 <http://www.accsoft.ch/download/accountingconcepts.pdf>

**Course Code: RUVGHM 603**

**Course Title : MARKETING – III**

COURSE OUTCOME	CO DESCRIPTION
CO 1	Advertise and digitally market a given agricultural produce
CO 2	Develop and promote a brand. Understand the legal implication of branding.
CO3	Make a sales budget.

### DETAILED SYLLABUS

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
RUVGHM 603	I	<b>Elements in marketing-</b> Documentation, terms of sale for domestic and international shipments, Packing, storage, transportation, distribution, financing, Types of marketing – direct (pick your own, road side sale, farmers market, ) - indirect( terminal market firms, brokers, processors, cooperatives) - Retail outlets - Online marketing. Developing Website for your company, Creating an E-shopping Site. Using Digital Marketing for promoting Business Online.	3 credit, 22 Lectures
	II	<b>Branding and Promotion</b> Brand development, brand positioning, brand promotion, Advertising and sales budgets, Integrated Marketing communication –features. Marketing Challenges and Opportunities, legal implications of branding.	22 Lectures

### PRACTICALS

Code	Topics	Credits
RUVGHMP 602	<b>MARKETING – III</b>	3
1	Prepare a supply chain management plan for fruit, flower and vegetable.	
2	Prepare a write up or presentation of supply chain produce	



<b>3</b>	Report	
<b>RUVGHMP 604 (Skill)</b>	<b>Work Integrated Learning – III</b> (Internship - greenhouse/polyhouse design and structures, maintenance of greenhouse, trouble shooting)-45 days	10

### References

- 1 The 1-Page Marketing Plan: Get New Customers, Make More Money, and Stand Book by Allan Dib
- 2 Crushing It!: How Great Entrepreneurs Build Their Business and Influence-and How You Can, Too Book by Gary Vaynerchuk
- 3 <http://www.accsoft.ch/download/accountingconcepts.pdf>
- 4 <http://cms.sinhgad.edu/media/365810/sample%20notes%20of%20basics%20of%20marketing.pdf>
- 5 <http://www.ddegjust.ac.in/studymaterial/pgdapr/pgdapr-105.pdf>

### MODALITY OF ASSESSMENT

#### SEMESTER VI

#### Internal Assessment - 40%

#### Paper I RUVGHM 601 - PROTECTED CULTIVATION - V

Sr No	Evaluation type	Marks
1	Assignment/ Project	20
2	Assignment/ Project/ Case Study on Alumni /Presentation	20
<b>Total</b>		<b>40</b>

#### Paper II RUVGHM 602 - ACCOUNTING-II

Sr No	Evaluation type	Marks
1	Assignment/ Project/ Open book test	30
2	Assignment/ Project/ Visits	20
3	Presentation	10
<b>Total</b>		<b>60</b>

#### Paper III RUVGHM603 - MARKETING -III

Sr No	Evaluation type	Marks
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1	Assignment/ Project	20
2	Assignment/ Project/ Presentation	20
3	Participation in various Departmental /intercollegiate activities	20
<b>Total</b>		<b>60</b>

### Semester End Theory Assessment

#### Paper I RUVGHM 601 - PROTECTED CULTIVATION - V

Questions	Options	Marks	Questions on
Q1	Any 5 out of 7	30	Unit I
Q.2	Any 5 out of 7	30	Unit II
<b>Total</b>		<b>60</b>	

#### Paper II RUVGHM 602 - ACCOUNTING-II

Questions	Options	Marks	Questions on
Q1	Any 6 out of 8	30	Unit I
Q.2	Any 6 out of 8	30	Unit II
Q3	Any 6 out of 8	30	Unit I & Unit II
<b>Total</b>		<b>90</b>	

#### Paper III RUVGHM603 - MARKETING -III

Questions	Options	Marks	Questions on
Q1	Any 6 out of 8	30	Unit I
Q.2	Any 6 out of 8	30	Unit II
Q3	Any 6 out of 8	30	Unit I & Unit II
<b>Total</b>		<b>90</b>	

**Practical Examination Pattern:****Internal Examination: 40%****Paper I RUVGHMP 601 - PROTECTED CULTIVATION - V**

Sr No	Evaluation type	Marks
1	Assignment/ Project/ Presentation/ Model making	30
2	Assignment/ Project/ Presentation	30
3	Project/ Presentation/ Case study	30
4	Greenhouse and hydroponics maintenance, tackling trouble shooting	30
<b>Total</b>		<b>120</b>

**Paper II RUVGHMP 602 - ACCOUNTING-II**

Sr No	Evaluation type	Marks
1	Assignment/ Project/ Open Book test	20
2	Assignment/ Project/ Quiz	20
3	Presentation/ Case study	20
<b>Total</b>		<b>60</b>

**Paper III RUVGHMP 603 - MARKETING -III**

Sr No	Evaluation type	Marks
1	Assignment/ Project/ Presentation/ Survey	20
2	Assignment/ Presentation/ Survey	20
3	Assignment/ Project/ Presentation/ Survey	20
<b>Total</b>		<b>60</b>

**A) External Examination: 60%****Semester End Practical Examination:****Paper I RUVGHMP 601 - PROTECTED CULTIVATION - V**

Particulars	Paper
Experiments	90
Fabrication of hydroponics system	30
Project	30
Viva	20
Journal	10
<b>Total</b>	<b>180</b>

**Paper II RUVGHMP 602 - ACCOUNTING-II**

Particulars	Paper
Experiments	60
Viva	20
Journal	10
<b>Total</b>	<b>90</b>

**Paper III RUVGHMP 603 - MARKETING -III**

Particulars	Paper
Experiments	60
Viva	20
Journal	10
<b>Total</b>	<b>90</b>

### Overall Examination & Marks Distribution Pattern

#### THEORY

Paper code	Paper name	Total marks	Internal marks	External marks	Time	Credits
RUVGHM 601	Protected Cultivation - V	100	40	60	2 hrs	02
RUVGHM 602	Accounting-II	150	60	90	2 ½ hrs	03
RUVGHM 603	Marketing -III	150	60	90	2 ½ hrs	03
<b>Total</b>		<b>400</b>				

#### PRACTICALS

Paper code	Paper name	Total marks	Internal marks	External marks	Credits
RUVGHM P601	Protected Cultivation – III	300	120	180	6
RUVGHM P602	Accounting- I	150	60	90	3
RUVGHM P604	Marketing – II	150	60	90	3
RUVGHMP 605	Work Integrated Learning – II (internship -greenhouse/polyhouse design and structures, maintenance of greenhouse, trouble shooting)	<b>500</b>	<b>250</b>	<b>Passing</b>	<b>10</b>
<b>Total</b>		<b>1100</b>			

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## CREDITS DISTRIBUTION

Year	Semester	Credits for Skill Component	Credits for General Education Component	Total credits for the Semester	Total credits for the Year
FYBVoc Diploma Greenhouse Supervisor	I	18	12	30	60
	II	18	12	30	
SYBVoc Advance Diploma Greenhouse Assistant Manager	I	18	12	30	60
	II	18	12	30	
TYBVoc BVoc Greenhouse Manager	I	18	12	30	60
	II	18	12	30	
<b>Total Credits</b>					<b>180</b>

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