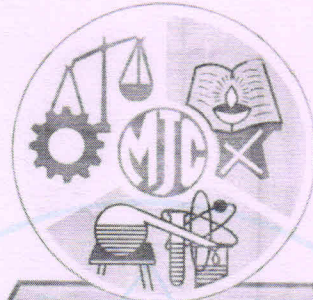


Annexure: I

Khandesh College Education Society's  
**Moolji Jaitha College, Jalgaon**

An "Autonomous College" Affiliated to  
KBC North Maharashtra University, Jalgaon



KNOWLEDGE IS POWER

ESTD. 1945

**SYLLABUS**

**Green House Technology**

**T.Y.B.Voc.**

**(Semester V & VI)**

[w. e. f. Academic Year: 2021-22]

*Bhushan Jeshi*

## T.Y.B.Voc. (Green House Technology)

### Program Specific Outcomes (PSO)

- This program enables students to attain, by the graduation
  - Operate and troubleshoot the agriculture equipments and necessary machines
  - Ability to perform and co-ordinate the Entrepreneurship development activities, project and supply chain management
  - Co-ordinate and manage the overall agriculture extension services
  - Ability perform activities with the help of soft skills, computer skills, financial skills and management skills

### Learning Objectives

- To impart the agricultural skills to the student.
- To make student ready for the job.
- To prepare student with life skills that are required to perform any job..
- To develop practical skills with a sound theoretical background

### Exam Pattern

- Each theory and practical course will be of 100 marks comprising of 60 marks external and 40 marks internal examination.

### External Theory Examination (60 marks)

- External examination will be of two hours duration for each theory course. There shall be 4 questions each carrying equal marks (15 marks each) while the tentative pattern of question papers shall be as follows;
  - Q1 (A) will be MCQ type question for 5 marks (attempt any 5 out of 7 questions).
  - Q1 (B) will be one line questions for 5 marks (attempt any 5 out of 7 questions).
  - Q2 (A) will be for 12 marks (attempt any 6 out of 8 questions).
  - Q2 (B) is compulsory question for 3 marks.
  - Q3 will be of 15 marks (attempt any 5 out of 7 questions).
  - Q4 will be of 15 marks (attempt any 3 out of 5 questions).

### External Practical Examination (60 marks):

- Practical examination shall be conducted by the respective department at the end of the semester. Practical examination will be of minimum 3 hours duration and shall be conducted as per schedule. There shall be 10 marks for *viva-voce*. Certified journal is compulsory to appear for practical examination.

### Internal Theory/ Practical Examination (40 marks):

- Internal theory assessment of the student by respective teacher will be comprehensive and continuous, based on written test/ assignment. The written test may comprise of both objective and subjective type questions.
- Internal practical examination should be conducted by respective department as per schedule given. For internal practical examination student should have completed journal. There shall be 10 marks for journal.

Bhushan Jashi

**T.Y.B.Voc. (Green House Technology) NSQF Level VII**  
(w.e.f. - June 2021)

T. Y. B. Voc. - Green House Technology (NSQF Level VII)					
Semester V					
General Education Component					
Paper No.	Paper Code	Paper Title	Mode	Credits	Marks
1	GHT 511	Fundamentals of management	Theory	2	100
2	GHT 512	Elementary Economics for agriculture	Theory	2	100
3	GHT 513	Office Operation Lab III	Practical	4	100
4	GHT 514	Preparation of business plan	Practical	4	100
<b>Total</b>				<b>12</b>	<b>400</b>
Skill Development Component					
5	GHT 521	Agriculture extension	Theory	2	100
6	GHT 522	Pre and post-Harvest Techniques	Theory	2	100
7	GHT 523	Complementary Techniques for additional benefits	Theory	2	100
8	GHT 524	AGR/Q7601 Agriculture Extension Service Provider	Practical	4	100
9	GHT 525	Complementary Techniques for additional benefits	Practical	4	100
10	GHT 526	Pre and post-Harvest Techniques of selected crops	Practical	4	100
<b>Total</b>				<b>18</b>	<b>600</b>
Total Credits = General Education Component + Skill Development Component					<b>12+18=30</b>
Semester VI					
General Education Component					
Paper No.	Paper Code	Paper Title	Mode	Credits	Marks
1	GHT 611	Financial accounting	Theory	2	100
2	GHT 612	Project Management & Entrepreneurship Development	Theory	2	100
3	GHT 613	Web literacy lab	Practical	4	100
4	GHT 614	Preparation of project report for green house development	Practical	4	100
<b>Total</b>				<b>12</b>	<b>400</b>
Skill Development Component					
5	GHT 621	Supply Chain Management	Theory	2	100
6	GHT 622	Agriculture marketing	Theory	2	100
7	GHT 623	Farm Machinery and Equipment	Theory	2	100
8	GHT 624	AGR/Q7501 Supply Chain Field Assistant	Practical	4	100
9	GHT 625	Preparation of proposal for export of Agri goods	Practical	4	100
10	GHT 626	Field training	Practical	4	100
<b>Total</b>				<b>18</b>	<b>600</b>
Total Credits = General Education Component + Skill Development Component					<b>12+18=30</b>

T.Y.B.Voc. [Green House Technology] syllabus, 2021-22, Moolji Jaitha College (Autonomous), Jalgaon

*Shushan Joshi*

## T.Y.B.Voc. (Green House Technology): Semester-V

### GHT 511: Fundamentals of Management

Total Hours: 30

Credits: 2

#### Course Objectives

- To know about the basics of management
- To know about the planning
- To know the concept directing and controlling

#### Course outcomes

Students will be able to

- Understand the basics of management
- Understand the process of planning
- Learn the meaning, importance and principles of direction and control

#### Detailing of the syllabus -

##### Unit I Introduction

Hours: 06

Definition, Function, Process, scope and principles of management; levels of management; managerial roles, managerial skill and activities; difference between management and administration; values and ethics in management

##### Unit II Evolution of Management

Hours: 08

Evolution of Management ThouAGR, Approaches of Management ThouAGR, Functions of Management. Management and organization

##### Unit III Planning

Hours: 08

Planning and Organizing Nature, Scope, Objective and Significance of Planning, Elements and Steps of Planning, Decision Making Organizing Principles, Span of Control, Line and Staff Relationship, Authority, Delegation and Decentralization. Effective Organizing, Organizational Structures, Formal and Informal Organizations, Staffing.

##### Unit IV Directing and controlling

Hours: 08

Direction- meaning, importance and principles; organization culture, corporate social responsibility; Motivation: Motive characteristic, motivation theories, leadership styles and approaches, control process: nature, need, method, tools and techniques

#### References Books:

- **Robbins and Coulter**, Fundamentals of Management **Publisher:** Pearson; 10 edition (7 January 2016) **ISBN-10:** 0134237471, **ISBN-13:** 978-0134237473
- **Grove Andrew**, High Output Management, Vintage; 2nd Vintage Books ed edition (29 August 1995), **ISBN-10:** 9780679762881, **ISBN-13:** 978-0679762881, **ASIN:** 0679762884

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*Shashan Joshi*

- Principles of Management essentials you always wanted to know, Vibrant Publishers; First Edition (4 May 2018), ISBN-10: 1946383937, ISBN-13: 978-1946383938
- **Stephen P. Robbins**, Organizational behaviour, Pearson; EiAGReenth edition (31 October 2018), Sold by: Amazon Asia-Pacific Holdings Private Limited, ASIN: B07TZPRPRM
- **Richard Templar**, The rules of Management, Pearson Education; Fourth edition (30 August 2018), ISBN-10: 9789352862368, ISBN-13: 978-9352862368, ASIN: 9352862368

**Teaching methods:**

- Classroom teaching, Lecture method, ICT enabled teaching



Bhushan Jasli

**T.Y.B.Voc. (Green House Technology): Semester-V**  
**GHT 512: Elementary Economics for agriculture**

**Total Hours: 30**

**Credits: 2**

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**Course Objectives**

- To introduce macroeconomics and micro economics
- To know about the cost, price, profits and books of accounts
- To introduce agriculture economics
- To introduce farm management

**Course outcomes**

Students will be able to

- Understand macro and micro economics at preliminary level
- Learn about cost, price, profits and books of accounts
- Know about agriculture economics at preliminary level
- Learn about the practices of farm management

**Detailing of the syllabus -**

**Unit 1: Introductory Macroeconomics**

**Hours: 06**

National Income and Related Aggregates; Determination of Income and Employment, understanding of Government Budget, Balance of Payments; Human development index; major challenges before Indian economy

**Unit 2: Introductory Micro Economics**

**Hours: 06**

Introduction to Micro Economics: Definition, scope and nature of Economics; Theory of Demand and Supply: Meaning and determinants of demand, Law of demand and Elasticity of demand, Price, income and cross elasticity; theory of consumer's behaviour, Meaning and determinants of supply, Law of supply and Elasticity of supply; price determination in different markets

**Unit 3: Costs, Price, Profits and Book of Accounts**

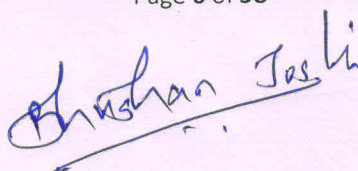
**Hours: 06**

Analysis of Costs and Costing Strategies; Market structures and Pricing Strategies; Cost Volume-Profit Analysis; Introduction to Financial Statements and Funds Flow Analysis.

**Unit 4: Agriculture economics and market survey**

**Hours: 06**

Definition, Nature and scope of agriculture economics; Salient features of Indian Agriculture; importance and factors influencing change in prices, problems and policies; Market survey – Collection of information of identified/potential activity to assess the demand /supply position, market trends, marketing practices, competition, current state of technology etc

  
Anushan Joshi

**Unit 5: Farm management:****Hours: 06**

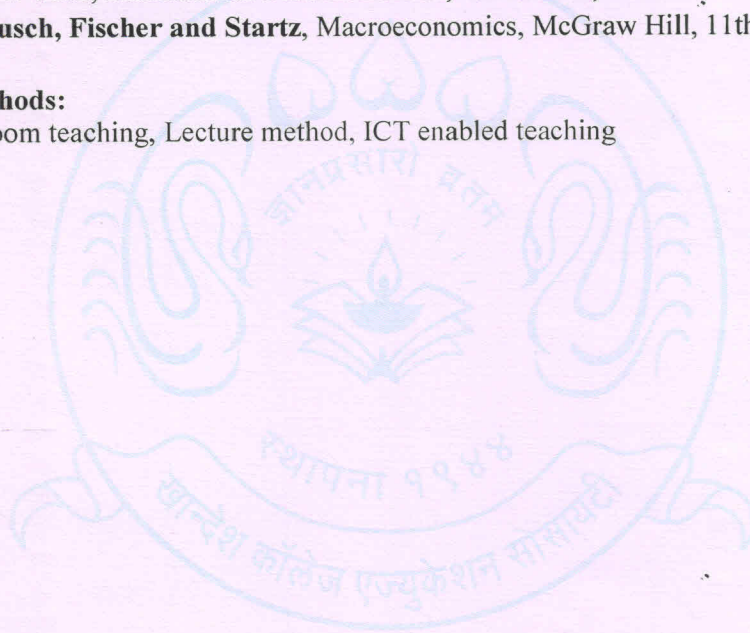
Meaning and concept, objectives; stages of farm management, elements of farm costing and accounting, corporate farming, collective farming, cooperative farming, Agriculture marketing and finance management

**References Books:**

- **Case, Karl E., Ray C. Fair and S. Oster** (2014). Principles of Economics, 9th Edition. Pearson Education, New Delhi.
- **Koutsoyiannis, A.** (1979). Modern Microeconomics – 2nd Ed. English Language Book Society, London Samuelson, Paul A. & Nordhaus, William D. (2010). Economics – 19th Ed. Tata McGraw Hill, New Delhi
- **N. Gregory Mankiw**, Economics: Principles and Applications, India edition by South Western, a part of Cengage Learning, Cengage Learning India Private Limited, 4<sup>th</sup> edition, 2007.
- **Joseph E. Stiglitz and Carl E. Walsh**, Economics, W.W. Norton & Company, Inc., New York, International Student Edition, 4th Edition, 2007.
- **Dornbusch, Fischer and Startz**, Macroeconomics, McGraw Hill, 11th edition, 2010.

**Teaching methods:**

- Classroom teaching, Lecture method, ICT enabled teaching



*Mushan Jashi*

## T.Y.B.Voc. (Green House Technology): Semester-V

### GHT 513: Office operations lab III

Total Hours: 60

Credits: 4

#### Course Objectives

- To learn different functions in word
- To learn mathematical functions in excel
- To learn the use of statistical functions in excel
- To learn more functions in power point

#### Course outcomes

Students will be able to

- Use the link in word processing software
- Use the mathematical functions in excel
- Use statistical functions like count, max, average etc
- Apply the custom animation in power point presentation

#### Detailing of the syllabus -

Sr. No.	Name of Practical	No. of Hours
01	Insert links in word processing software	04
02	Insert equations in word processing software	04
03	Proof the document and Insert comments in word processing software	04
04	Track changes in word processing software	12
05	Insert Object in word processing and spreadsheet software	12
06	Use comparison operators (=, <, >, <=, >=, <>) in spreadsheet software	12
07	Use mathematical functions in spreadsheet software	12
08	Use statistical functions (count, count if, max, min, average, median, mode) in spreadsheet software	12
09	Use logical functions (if, AND, OR) in spreadsheet software	08
10	Use lookup and reference functions (VLOOKUP, HLOOKUP, MATCH, INDEX) in spreadsheet software	12
11	Use financial functions (Compound interest, EMI, CAGR, XIRR, FV) in spreadsheet software	12
12	Apply the custom animation to the text and image by using presentation software	08

*Dhushan Joshi*



13	Apply the custom animation to the chart by using presentation software	04
14	Set up slide show by using presentation software	04

**References Books:**

- **Saxsena S.** Ms Office 2007 in a Nutshell, 2011, Vikas Publishing House, ISBN-10: 8125950362
- **Shrivastava S. S.** (2008). MS-Office. Firewall Media
- **Joyce J. & Moon M.** Microsoft Office Word 2007 Plain & Simple. Microsoft Press
- **Kumar Bittu,** Microsoft Office 2010, V&S Publishers, 2015



Bhushan Jeshi

## T.Y.B.Voc. (Green House Technology): Semester-V

### GHT 514: Preparation of business plan

Total Hours: 60

Credits: 4

#### Course Objectives

- To develop questionnaire as per need
- To do market survey
- To prepare a business plan

#### Course outcomes

Students will be able to

- To understand process of preparation of questionnaire as per requirement
- Do the market survey and understand the difficulties of it
- To prepare a business plan and present it

#### Detailing of the syllabus -

#### Practical

1. Preparation of questionnaire for market survey
2. Market survey for any given product
3. Data arrangement in soft
4. Analysis of data
5. Preparation of business plan
6. Presentation of business plan

#### References Books:

- **Shelton Hal** , The Secrets to Writing A Successful Business Plan, Summit Valley Press; 2 edition (31 January 2014), ASIN: B00I6S87LW
- **Genadinik Alex**, Business Plan Template and Example: How to Write a Business Plan, Semantic Valley LLC; 5 edition (7 December 2015)
- **Rhonda Abrams**, Successful Business Plan: Secrets & Strategies, Planning Shop; 5 edition (September 16, 2010)
- **Jr. Horan, James T.**, The One Page Business Plan for the Creative Entrepreneur One Page Business Plan Co; 3rd ed. edition (1 March 2004) ISBN-10: 9781891315091
- **Curtis Veechi**, Creating a Business Plan for Dummies Book, For Dummies; 1 edition (February 14, 2014)

*Bhushan Jashi*

**T.Y.B.Voc. (Green House Technology): Semester-V**  
**GHT 521: Agriculture Extension**

**Total Hours: 30**

**Credits: 02**

**Course Objectives**

- To know extension and its services
- To know rural institutes and its functions
- To know different agricultural development program
- To know about the training

**Course outcomes**

Students will be able to

- Understand the extension and its importance
- Understand the PRI
- Understand the benefits of different agricultural programs
- Understand the process of training

**Detailing of the syllabus -**

**Unit 1**

**Hours: 06**

Extension Education: - Meaning, definition, concepts, objectives and principles. Agricultural Extension - Meaning, Definition, scope and objectives. Community Development and Integrated Rural Development: - concept, principles and objectives. Role of agricultural extension in different sectors of agriculture and rural development, differences between Community Development and Extension Education

**Unit 2**

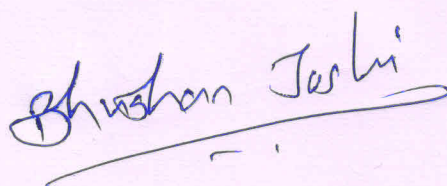
**Hours: 06**

Understanding of basic rural institutions: Panchayat Raj system - Meaning of democratic decentralization and Panchayat Raj, three tiers of Panchayat Raj system, powers, functions and organizational set up

**Unit 3**

**Hours: 06**

Agricultural Extension in the context of enhancing productivity, Quality, Nutrition, post harvest technology, product processing, Profitability, Income and Employment.



**Unit 4****Hours: 06**

Agricultural Development programs with reference to objectives and salient features – Watershed Development Program (WDP), National Agricultural Technology Project (NATP), ATMA, ATIC, NHM, NAIP ; Social Justice and Poverty Alleviation Programs - Integrated Tribal Development Program (ITDP), Integrated Rural Development Program (IRDP), Swarna Jayanthi Gram Swarojgar Yojana (SGSY), Prime Minister Employment Yojana (PMEY). Integrated Child Development Scheme (ICDS) and Mahila Samridhi Yojana (MSY), Mahila Arthik Vikas Mahamandal (MAVIM).

**Unit 5****Hours: 06**

Training and development of human resources; Identifying training needs and assessment of training impact; Training – principles, importance, methods and factors. Phases of training - pre training and post training

**Reference Books**

- **Dahama, O.P. and O.P. Bhatnagar.** Education and Communication for Development. Oxford and IBH Publishing Co., New Delhi.
- Directorate of Extension: Extension Education in Community Development. Govt. of India. Delhi.
- **Ray, G.L.** Extension Communication and Management. Naya Prakash, Kolkata.
- **Sandhu, A. S.** Text Book on Agricultural Communication Process and Methods. Oxford and IBH Publishing Pvt. Ltd., New Delhi.
- **Singh, Katar.** Rural Development – Principle, Policy and Management. Sage Publication, New Delhi. **Swanson B.I. (Ed.) (1997).** Agricultural Extension – A Reference Manual. FAO, Rome.
- **Thyagrajan, M. (1982).** Project Management through Network Techniques (PERT, CPM) Indian Institute of Public Administration, New Delhi.

**Teaching methods:**

- Classroom teaching, Lecture method, ICT enabled teaching

*Bhushan Joshi*

**T.Y.B.Voc. (Green House Technology): Semester-V**  
**GHT 522: Pre and Post-Harvest Techniques**

**Total Hours: 30**

**Credits: 02**

**Course Objectives**

- To know about pre and post harvest techniques
- To know about maturity and harvesting indices
- To know about the pre and post harvest operations and its importance

**Course outcomes**

Students will be able to

- Get preliminary knowledge of pre and post harvest techniques
- Learn the maturity and harvesting indices
- Understand the pre and post harvest operations and its importance

**Detailing of the syllabus -**

- Unit 1:** **Hours: 06**  
Maturity indices, harvesting practices for specific market requirements; Quality control: Different attributes Physiological, biochemical and chemical attributes; importance and functions of quality control
- Unit 2:** **Hours: 06**  
Physiology and biochemistry of fruit ripening, ethylene evolution and ethylene management, factors leading to post-harvest loss, pre-cooling.
- Unit 3:** **Hours: 06**  
Treatments prior to shipment, viz., chlorination, waxing, chemicals, biocontrol agents and natural plant products. Methods of storage: ventilated, refrigerated, MAS, CA storage, physical injuries and disorders
- Unit 4:** **Hours: 06**  
Grading, sorting standards of selected crops; adulteration and food safety; Quality manuals, documentation, International and Indian quality system and standards
- Unit 5:** **Hours: 06**  
Packaging, labelling and branding of different produce; Elementary knowledge of different levels of market; essentials for export

**Reference books:**

- **P L Jain**, "Quality Control and Total Quality Management", 2001, Tata McGraw-Hill Education, ISBN: 978-0070402140
- T.Y.B.Voc. [Green House Technology] syllabus, 2021-22, Moolji Jaitha College (Autonomous), Jalgaon

*Bhushan Joshi*

- **Steven DuPuis, John Silva**, "Package Design Workbook: The Art and Science of Successful Packaging", 2011, Rockport Publishers, ISBN: 978-1592537082
- **Chadha KL & Pareek OP.** (Eds.). 1996 Advances in Horticulture. Vol. IV. Malhotra Publ. House.
- **Mitra SK.** 1997. Post-Harvest Physiology and Storage of Tropical and Sub-tropical Fruits. CABI.
- **Ranganna S.** 1997. Hand Book of Analysis and Quality Control for Fruit and Vegetable Products. Tata McGraw-Hill.
- **Sudheer KP & Indira V.** 2007. Post-Harvest Technology of Horticultural Crops. New India Publ. Willis R, Mc Glassen WB, Graham D & Joyce D. 1998. Post-Harvest. An 17 Introduction to the Physiology and Handling of Fruits, Vegetables and Ornamentals. CABI.

**Teaching methods:**

- Classroom teaching, Lecture method, ICT enabled teaching



Bhushan Joshi

**T.Y.B.Voc. (Green House Technology): Semester-V**  
**GHT 523: Complementary techniques for additional benefits**

**Total Hours: 30**

**Credits: 02**

**Course Objectives**

- To know complementary techniques
- To know the importance and advantages of biofertilizers
- To know different types of biofertilizers
- To know about the hydroponic technique

**Course outcomes**

Students will be able to

- Understand the complementary techniques
- Understand the importance and advantages of biofertilizers
- Understand the benefits of different types of biofertilizers
- Understand the process of hydroponic technique

**Detailing of the syllabus -**

**Unit 1:**

Introduction, definition, importance and advantages of bio-fertilizer, types and functions, method of application, constraints in bio-fertilizer

**Hours: 06**

**Unit 2:**

General account of the microbes used as biofertilizer: isolation, identification, mass multiplication, carrier-based inoculants: - Rhizobium, Az spirillum, Azotobacterial; Actinorhizal symbiosis.

**Hours: 06**

**Unit 3:**

Cyanobacteria (blue green algae), Azolla and Anabaena azollae association, nitrogen fixation, factors affecting growth, blue green algae and Azolla in rice cultivation. Mycorrhizal association: types, taxonomy, occurrence and distribution, phosphorus nutrition

**Hours: 06**

**Unit 4:**

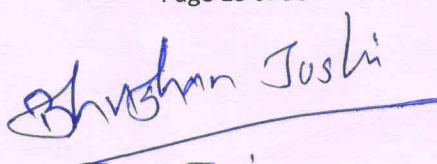
Green manuring and mulching: different types, methods, advantages, source of nutrients from green manure; bio-dynamics

**Hours: 06**

**Unit 5:**

Hydroponic technique: Introduction, definition, different types of hydroponics; Advantages and disadvantages of hydroponics, crops suitable for hydroponics; study different growing media; different techniques of hydroponics media in hydroponics

**Hours: 06**



### Reference Books:

- **Eiri Board**, “Hand Book Of Biofertilizers & Vermiculture”, 2009, Engineers India Research Institute, ISBN: 978-8189765019
- **Shalini Suri**, “Biofertilizer and Biopesticide”, 2011, Aph Publishing Corporation, ISBN: 978-8131311042
- **Reeta Khosla**, “Biofertilizers and Biocontrol Agents for Organic Farming”, 1<sup>st</sup> Edition, 2017, Kojo Press, ISBN: 9788192756790
- **R. Shankara Reddy**, “Biofertilizer technology “, 1<sup>st</sup> Edition, 2012, Akhand Publishing House, ISBN: 978-9381416129
- **Channabasava A., H. C. Lakshman**, “Biofertilizers and Biopesticides”, 2014, Pointer Publishers, ISBN: 9788171327751

### Teaching methods:

- Classroom teaching, Lecture method, ICT enabled teaching



*Bhushan Jadhav*



**T.Y.B.Voc. (Green House Technology): Semester-V**  
**GHT 524: Agriculture Extension Service Provider (AGR/Q7601)**

**Total Hours: 60**

**Credits: 4**

**Course Objectives**

- To know Agriculture extension
- To know the importance of extension services
- To know different types of extension services
- To know about the linkages in extension activities

**Course outcomes**

Students will be able to

- Understand the Agriculture extension
- Understand the importance of extension services
- Understand the different types of extension services
- Understand the process of linkages in extension activities

**Detailing of the syllabus -**

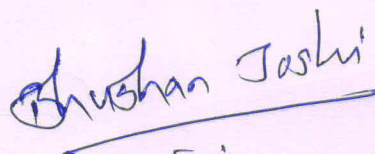
1. AGR/N7601 – Plan for the extension services
2. AGR/N7602 - Identify location specify of agricultural technology
3. AGR/N7603 - Make frontline demonstrations
4. AGR/N7604 – Provide training to farmers
5. AGR/N7605 – Assist with backward and forward linkages

**Reference Books**

- **Dahama, O.P. and O.P. Bhatnagar.** Education and Communication for Development. Oxford and IBH Publishing Co., New Delhi.
- Directorate of Extension: Extension Education in Community Development. Govt. of India. Delhi.
- **Ray, G.L.** Extension Communication and Management. Naya Prakash, Kolkata.
- **Sandhu, A. S.** Text Book on Agricultural Communication Process and Methods. Oxford and IBH Publishing Pvt. Ltd., New Delhi.
- **Singh, Katar.** Rural Development – Principle, Policy and Management. Sage Publication, New Delhi. Swanson B.I. (Ed.) (1997). Agricultural Extension – A Reference Manual. FAO, Rome.
- **Thyagrajan, M.** (1982). Project Management through Network Techniques (PERT, CPM) Indian Institute of Public Administration, New Delhi.

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Bhushan Jashni

**T.Y.B.Voc. (Green House Technology): Semester-V**  
**GHT 525: Complementary Techniques for additional benefits**

Total Hours: 60

Credits: 04

**Course Objectives**

- To know complementary techniques
- To know the importance and advantages of biofertilizers
- To know different types of biofertilizers
- To know about the hydroponic technique

**Course outcomes**

Students will be able to

- Understand the complementary techniques
- Understand the importance and advantages of biofertilizers
- Understand the benefits of different types of biofertilizers
- Understand the process of hydroponic technique

**Detailing of the syllabus -**

**Practical**

**A: Hydroponics:**

- Calculation of available nutrient from the given fertilizer
- Preparation of Growing medium / Nutrient solution
- Preparation of prototype for deep water cultivation
- Preparation of prototype for aeroponic
- Cultivation of vegetables using hydroponic method

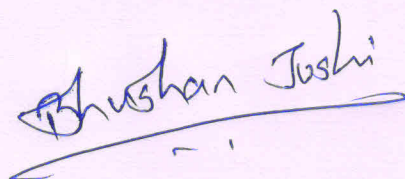
**B: Biofertilizers production method for:**

- Azatobactor,
- Trichoderma and
- Rhizobium

**Reference Books:**

- **Eiri Board**, "Hand Book Of Biofertilizers & Vermiculture", 2009, Engineers India Research Institute, ISBN: 978-8189765019
- **Shalini Suri**, "Biofertilizer and Biopesticide", 2011, Aph Publishing Corporation, ISBN: 978-8131311042
- **Reeta Khosla**, "Biofertilizers and Biocontrol Agents for Organic Farming", 1<sup>st</sup> Edition, 2017, Kojo Press, ISBN: 9788192756790
- **R. Shankara Reddy**, "Biofertilizer technology ", 1<sup>st</sup> Edition, 2012, Akhand Publishing House, ISBN: 978-9381416129
- **Channabasava A., H. C. Lakshman**, "Biofertilizers and Biopesticides", 2014, Pointer Publishers, ISBN: 9788171327751

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## T.Y.B.Voc. (Green House Technology): Semester-V

### GHT 526: Pre and post-Harvest Techniques of selected crops

Total Hours: 60

Credits: 04

#### Course Objectives

- To know pre and post harvest techniques
- To know the importance packaging, sorting, grading
- To know about harvesting and maturity indices
- To know about the quality characteristics of the selected crops

#### Course outcomes

Students will be able to

- Understand the pre and post harvest techniques
- Understand the importance packaging, sorting, grading
- Understand the harvesting and maturity indices
- Understand the the quality characteristics of the selected crops

#### Detailing of the syllabus -

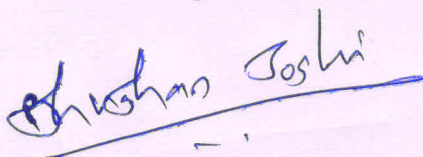
##### Practical:

1. To study maturity stages of commercially important horticultural crops
2. To study improved packing and storage of important horticultural commodities
3. Maturity Signs and Harvesting of Fruits and Vegetables
4. Identification of Different equipment's used in Processing of Fruits and Vegetables
5. Grading of Fruits and Vegetables
6. To determine physiological loss in weight of fruits and vegetables
7. Estimation of transpiration rate, respiration rate, ethylene release and study of vase life extension in cut flower using chemicals
8. Estimation of quality characteristics in stored fruits and vegetables
9. Cold chain management - visit to cold storage and CA storage units
10. Visit to fruit and vegetable processing units
11. Laboratory examination of vegetable products
12. Visit to processing units to study the layout, equipment, hygiene, sanitation and residual / waste management.
13. Case study of any crop from seedling preparation to harvest

#### Reference books:

- **P L Jain**, "Quality Control and Total Quality Management", 2001, Tata McGraw-Hill Education, ISBN: 978-0070402140
- **Steven DuPuis, John Silva**, "Package Design Workbook: The Art and Science of Successful Packaging", 2011, Rockport Publishers, ISBN: 978-1592537082
- **Chadha KL & Pareek OP.** (Eds.). 1996 Advances in Horticulture. Vol. IV. Malhotra Publ. House.
- **Mitra SK.** 1997. Post-Harvest Physiology and Storage of Tropical and Sub-tropical Fruits. CABI.

T.Y.B.Voc. [Green House Technology] syllabus, 2021-22, Moolji Jaitha College (Autonomous), Jalgaon



- **Ranganna S.** 1997. Hand Book of Analysis and Quality Control for Fruit and Vegetable Products. Tata McGraw-Hill.
- **Sudheer KP & Indira V.** 2007. Post-Harvest Technology of Horticultural Crops. New India Publ. Willis R, Mc Glassen WB, Graham D & Joyce D. 1998. Post-Harvest. An 17 Introduction to the Physiology and Handling of Fruits, Vegetables and Ornamentals. CABI.



*Bhushan Joshi*

## T.Y.B.Voc. (Green House Technology): Semester-VI

Semester VI					
General Education Component					
Paper No.	Paper Code	Paper Title	Mode	Credits	Marks
1	GHT 611	Financial accounting	Theory	2	100
2	GHT 612	Project Management & Entrepreneurship Development	Theory	2	100
3	GHT 613	Web literacy lab	Practical	4	100
4	GHT 614	Preparation of project report for green house development	Practical	4	100
<b>Total</b>				<b>12</b>	<b>400</b>
Skill Development Component					
5	GHT 621	Supply Chain Management	Theory	2	100
6	GHT 622	Agriculture marketing	Theory	2	100
7	GHT 623	Farm Machinery and Equipment	Theory	2	100
8	GHT 624	AGR/Q7501 Supply Chain Field Assistant	Practical	4	100
9	GHT 625	Preparation of proposal for export of Agri goods	Practical	4	100
10	GHT 626	Field training	Practical	4	100
<b>Total</b>				<b>18</b>	<b>600</b>
Total Credits = General Education Component + Skill Development Component					<b>12+18=30</b>

*Bhushan Joshi*

**T.Y.B.Voc. (Green House Technology): Semester-VI**  
**GHT 611: Financial Accounting**

**Total Hours: 30**

**Credits: 2**

**Course objectives:**

- To gain basic knowledge of financial accounting
- To study financial, cost and management accounting
- To learn accounting for depreciation
- To understand accounting for partnership firm

**Course outcomes:**

Students will be able to

- Understand the basic knowledge of financial accounting
- Understand the financial, cost and management accounting
- Understand the accounting for depreciation
- Understand the accounting for partnership firm

**Detailing of syllabus -**

**Unit 1: Introduction to Financial Accounting:**

**Hours: 06**

Scope and Importance of Financial Accounting; Basic accounting; Accounting Concept and conventions, assumption and limitations; Accounting principles, double entry system, journal, ledger, purchase book, sales book, cash book, petty cash book, trial balance, income and expenditure account, posting of entries in accounts books

**Unit 2: Financial, Cost and Management Accounting:**

**Hours: 06**

Preparations of Financial statements, Preparation of trial balance sheet, rectifications of errors, bank reconciliation statements

**Unit 3: Accounting for depreciation:**

**Hours: 06**

Understanding of depreciation, Types of depreciation method, selection of depreciation method; choice of method; Different Types of Reserves

**Unit 4 Accounting for Partnership Firm**

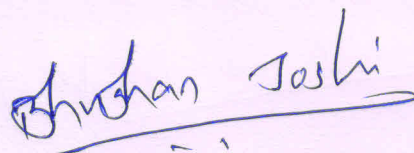
**Hours: 06**

Introduction, Admission of a New Partner, Death and Retirement of Partners, Dissolution of Partnership Firm

**Unit 5: Analysis of Financial Statements**

**Hours: 06**

Nature and Limitations, Techniques of Analysis and Interpretation of Financial Statements, Ratio Analysis.



**Reference Books:**

- **Kimmel and Weygandt and Kieso**, Financial Accounting, Published by John Wiley, ISBN 9788126551262
- **Tulsian P C**, Financial Accounting, Published by **PEARSON INDIA**, ISBN 9788177582284
- **Mohamed Hanif and Amitabha Mukherjee**, FINANCIAL ACCOUNTING VOL.III by, McGraw Hill ISBN 9789352604128
- **Charles T Horngren et all.** Introduction To Financial Accounting 11th Edition by, PEARSON INDIA, ISBN 9789352862474

**Teaching methods:**

- Classroom teaching, Lecture method, ICT enabled teaching



Bhushan Jishi

**T.Y.B.Voc. (Green House Technology): Semester-VI**  
**GHT 612: Project management and Entrepreneurship**  
**development**

**Total Hours: 30**

**Credits: 02**

**Course Objectives**

- To know project management and entrepreneurship development
- To know the importance and advantages of project management
- To know different types of business plans and ventures
- To know about the enterprise growth, expansion and diversification

**Course outcomes**

Students will be able to

- Understand the project management and entrepreneurship development
- Understand the importance and advantages of project management
- Understand the different types of business plans and ventures
- Understand the about the enterprise growth, expansion and diversification

**Detailing of the syllabus -**

**Unit 1 Introduction to Entrepreneurship**

**Hours: 06**

Meaning and Importance, Factors influencing, entrepreneurship, Characteristics of an entrepreneur viz., Creativity, Innovations, Methods to Initiate Ventures, Legal Challenges, difference between wage employment, self-employment and entrepreneurship

**Unit 2 Entrepreneurial competencies**

**Hours: 06**

Defining Competencies – Combination of knowledge, skill  
Understanding all competencies; Relevance of entrepreneurial Competencies at different stages of enterprise launching and management

**Unit 3 Business Plan for New Ventures**

**Hours: 06**

Meaning and Objectives of a Business Plan, Advantages and cost of preparing a Business Plan, Elements, Critical Assessment

**Unit 4: Systematic Planning & Efficiency**

**Hours: 06**

What is quality; attributes of quality; factors affecting quality; quality Management; project its components and systematic planning;

**Unit 5 Enterprise growth, expansion & diversification**

**Hours: 06**

Critical factors contributing to the sustenance of an enterprise; Need for growth in the enterprise; various avenues for growth of an enterprise; product addition, product deletion and product substitution; forward & backward linkages

*Bhushan Joshi*



### Reference Books:

- **Tendon, C:** Environment and Entrepreneur; Clough Publications, Allahabad.
- **Siner A David:** Entrepreneurial Megabucks; John Wiley and Sons, New York.
- **Srivastava S. B:** A Practical Guide to Industrial Entrepreneurs; Sultan Chand and Sons, New Delhi.
- **Prasanna Chandra:** Project Preparation, Appraisal, Implementation; Tata McGraw Hill. New Delhi.
- **Pandey I.M:** Venture Capital - The Indian Experience; Prentice Hall of India. New Delhi
- **Holt:** Entrepreneurship-New Venture Creation; Prentice Hall of India. New Delhi

### Teaching methods:

- Classroom teaching, Lecture method, ICT enabled teaching



*Prakash Jashi*

## T.Y.B.Voc. (Green House Technology): Semester-VI

### GHT 613: Web Literacy Lab

Total Hours: 60

Credits: 04

#### Course Objectives

- To know web literacy
- To know the importance of internet and browsers
- To know different types of websites
- To know about the blog, Digi locker, Desktop remote applications, maps

#### Course outcomes

Students will be able to

- Understand the web literacy
- Understand the importance of internet and browsers
- Understand the different types of websites
- Understand the about the blog, Digi locker, Desktop remote applications, maps

#### Detailing of the syllabus -

#### Practical

Sr. No.	Name of Practical	No. of Hours
01	Understanding of devices used in internet	04
02	Getting Connected to Web	04
03	Understanding Web Browsers	04
04	Getting domain name	04
05	Searching the information on web	08
06	Searching images of various types	08
07	Surf leading websites in field of Government, Education, news and Science	12
08	Understanding username & password and create secure passwords	08
09	Creating Email address	04
10	Email operations	12
11	Create a blog	08
12	Use of Digi Locker	12
13	Use of tools to type in regional language and use of Google Translator	08
14	Use of remote desktop application (Any Desk, Ammy Admin or TeamViewer)	08
15	Finding the path on Google map	08
16	Searching and applying jobs on web	08

*Abhishek Joshi*

**References Books:**

- **Saxena S.** Ms Office 2007 in a Nutshell, 2011, Vikas Publishing House, ISBN-10: 8125950362
- **Shrivastava S. S.** (2008). MS-Office. Firewall Media
- **Joyce J. & Moon M.** Microsoft Office Word 2007 Plain & Simple. Microsoft Press
- **Kumar Bittu,** Microsoft Office 2010, V&S Publishers, 2015
- **Greenlaw R and Hepp E,** Fundamentals of Internet and www by, Tata McGraw-Hill, 2007
- **Patel & Lal B. Barik,** Internet & Web Technology by B, Acme Learning Publishers



*Bhushan Jasli*

**T.Y.B.Voc. (Green House Technology): Semester-VI**  
**GHT 614: Preparation of project report for green house development**

**Total Hours: 60**

**Credits: 04**

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**Course Objectives**

- To know green house development
- To know the importance of project report
- To know different types of greenhouses
- To know about the preparation of project reports

**Course outcomes**

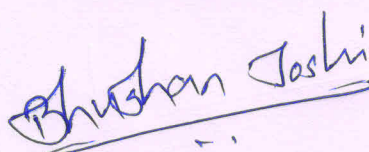
Students will be able to

- Understand the green house development
- Understand the importance of project report
- Understand the different types of greenhouses
- Understand the about the preparation of project reports

**Detailing of the syllabus -**

**Preparation of project report for green house development after field survey on following criteria:**

- 1 About the Applicant /Promoter and his/her entrepreneurship
- 2 Details of benefits availed by the Applicant / Promoter
- 3 About Project -Name, Rationale, Management and Description
4. Project details
  - 4a. Agro-climatic suitability / feasibility
  - 4b. Market viability
  - 4c. Financial viability
  - 4d. Land development to harvest of crop
  - 4e. Post-harvest management
  - 4f. Marketing
  - 4g. Value addition
5. Annexures



**Reference Books:**

**Prasanna Chandra:** Project Preparation, Appraisal, Implementation; Tata McGraw Hill. New Delhi.

**Pandey I.M:** Venture Capital - The Indian Experience; Prentice Hall of India. New Delhi  
**Holt:** Entrepreneurship-New Venture Creation; Prentice Hall of India. New Delhi



Shushan Joshi

## T.Y.B.Voc. (Green House Technology): Semester-VI

### GHT 621: Supply Chain Management

Total Hours: 30

Credits: 02

#### Course Objectives

- To know supply chain management
- To know the demand and procurement management
- To know logistic management
- To know about the customer relationship management

#### Course outcomes

Students will be able to

- Understand the supply chain management
- Understand the demand and procurement management
- Understand the logistic management
- Understand the about the customer relationship management

#### Detailing of the syllabus -

##### UNIT I: Introduction

Hours: 6

Introduction, objectives and Present Need; Conceptual Model of Supply Chain Management; Elements of SCM; understanding of Traditional selling systems, value chain marketing system and supply chain system

##### UNIT II: Demand management

Hours: 6

Demand Management in Supply Chain: Types of Demand, Demand Planning and Forecasting; Operations Management in Supply Chain, Basic Principles of Manufacturing Management

##### UNIT III: Procurement Management

Hours: 6

Procurement Management in Agri. Supply chain: Purchasing Cycle, Types of Purchases, Contract/Corporate Farming, Classification of Purchases Goods or Services

##### UNIT IV: Logistic Management

Hours: 6

Logistics Management: History and Evolution of Logistics; Elements of Logistic Management; Distribution Management, Transportation Management; Service Innovation; Packaging for Logistics

##### Unit V: CRM

Hours: 6

Customer relationship management (CRM): introduction, need, process and types, customer service management, supply chain mapping

*Bhushan Jadhav*

**Reference Books:**

- **Martin Christopher**, Logistics & Supply Chain Management,
- **Shoshanah Cohen**, Strategic Supply Chain Management: The Five Core Disciplines for Top Performance, Second Edition, ISBN-10: 9780071813082, ISBN-13: 978-0071813082
- ASIN: 007181308X
- **Hugos Michael H.**, Essentials of Supply Chain Management, Publisher: John Wiley & Sons; 3rd edition; ISBN-10: 0470942185; ISBN-13: 978-0470942185
- **Khan**, Handbook for Supply Chain Risk Management, Published by Cengage Learning, ISBN 9788131521878

**Teaching methods:**

- Classroom teaching, Lecture method, ICT enabled teaching



*Bhushan Jashu*

## T.Y.B.Voc. (Green House Technology): Semester-VI

### GHT 622: Agriculture marketing

Total Hours: 30

Credits: 2

#### Course Objectives

- To know agriculture marketing
- To know the importance of marketing
- To know different channels of marketing
- To know about the warehousing and agri export

#### Course outcomes

Students will be able to

- Understand the agriculture marketing
- Understand the importance of marketing
- Understand the different channels of marketing
- Understand the about the warehousing and agri export

#### Detailing of the syllabus -

##### Unit 1: Agriculture marketing

Hours: 06

Definition, concept and scope, components of a market, importance of agricultural marketing, classification, types of markets, strategic management in Agri business; agriculture production scenario in India

##### Unit 2: Channel of marketing

Hours: 06

Channel of Marketing: Meaning, definition, channels of different products, market functionaries and their role.

##### Unit 3: Agriculture product

Hours: 06

Product planning, Nature and supply of agricultural products, marketable and marketed surplus. Types and reasons for price movements and their effect on agriculture price stabilization and price support policies, Problems of agricultural marketing, Nature, scope and role of cooperative marketing in India

##### Unit 4: Warehousing

Hours: 06

Role of warehousing, State and Central Warehousing Corporations, objectives, functions, advantages, speculation, future trading and hedging.

##### Unit-5: Agri Export

Hours: 06

Identifying foreign markets for agri export, marketing plan for exports, export documents and procedure, terms of payment and export finance, legal dimensions; Institutional infrastructure for export promotion in India, export assistance, State trading in imports and exports, working of the State trading organisations in India

*Bhushan Joshi*



**Reference books:**

- **Acharya, S. S. and N. L. Agarwal**, Agricultural Marketing in India, Oxford and IBH Publishing Company, 1987
- **Kohls Richard L**, Marketing of agricultural products, ISBN-13: 978-0130105844, ISBN-10: 0130105848
- **Norwood F. Bailey and Jayson Lusk**, Agricultural Marketing and Price Analysis, Publisher: Pearson, ISBN-10: 0132211211, ISBN-13: 978-0132211215

**Teaching methods:**

- Classroom teaching, Lecture method, ICT enabled teaching



*Mushan Tashi*

## T.Y.B.Voc. (Green House Technology): Semester-VI

### GHT 623: Farm Machinery and Equipment

Total Hours: 30

Credits: 2

#### Course Objectives

- To know farm machinery and equipments
- To know the importance of farm machinery and equipments
- To know different types of farming equipments
- To know about the harvesting equipments

#### Course outcomes

Students will be able to

- Understand the farm machinery and equipments
- Understand the importance of farm machinery and equipments
- Understand the different types of farming equipments
- Understand the about the harvesting equipments

#### Detailing of the syllabus -

##### Unit 1: Introduction

Hours: 8

Objectives of farm mechanization. Classification of farm machines. Materials of construction and heat treatment; Principles of operation and selection of machines used for production of crops; Mechanization Terminology, Field capacities and economics of machinery.

##### Unit 2: Tillage and earth moving equipment

Hours: 8

Objectives of tillage; Primary and secondary tillage equipment; Forces acting on tillage tools; Hitching systems and controls. Draft measurement of tillage equipment; ploughing  
Earth moving equipment - their construction & working principles viz Bulldozer, Trencher, Elevators etc.

##### Unit 3: Planting and plant protection related equipment

Hours: 8

Sowing, planting & transplanting equipment - their calibration and adjustments. Fertilizer application equipment. Weed control and Plant protection equipment - sprayers and dusters, their calibration, selection, constructional features of different components and adjustments.

##### Unit 4: Harvesting and post harvesting equipment

Hours: 6

Introduction to Mower, reaper, threshing machine, combined harvester

*Bhushan Joshi*

**Reference books:**

- **Bell Brian**, Farm Machinery published by Old Pond Publishing Ltd; 6th Revised edition (12 January 2016), **ISBN-10:** 1910456063, **ISBN-13:** 978-1910456064
- **Kepner**, Principles of Farm Machinery, CBS Publishers & Distributors (2005), **ISBN-10:** 8123909772, **ISBN-13:** 978-8123909776
- **John Deere**, The Operation, Care, and Repair of Farm Machinery (Nineteenth Edition), published by John Deere; 19th edition (January 1, 1945), **ASIN:** B003XLIC1M
- **Basavaraj, D.Srigiri & Jayan P.R.**, A Textbook Of Farm Machinery And Power Engineering, **ISBN 9789387973640**

**Teaching methods:**

- Classroom teaching, Lecture method, ICT enabled teaching



*Bhushan Jashi*

**T.Y.B.Voc. (Green House Technology): Semester-VI**

**GHT 624: Supply Chain Field Assistant AGR/Q7501**

**Total Hours: 60**

**Credits: 4**

**Course Objectives**

- To know supply chain management
- To know the demand and procurement management
- To know logistic management
- To know about the customer relationship management

**Course outcomes**

Students will be able to

- Understand the supply chain management
- Understand the demand and procurement management
- Understand the logistic management
- Understand the about the customer relationship management

**Detailing of the syllabus -**

**Practical**

1. AGR/N7501 – Coordinate with buyer and farmer
2. AGR/N7502 – Procure the stock
3. AGR/N7503 - Pack and store the stock
4. AGR/N7504 – Arrange for transportation of produce
5. AGR/N9905 – Coordinate with colleagues
6. AGR/N9906 – Maintain safe work environment

**Reference Books:**

- **Martin Christopher**, Logistics & Supply Chain Management,
- **Shoshanah Cohen**, Strategic Supply Chain Management: The Five Core Disciplines for Top Performance, Second Edition, **ISBN-10: 9780071813082, ISBN-13: 978-0071813082**
- **ASIN: 007181308X**
- **Hugos Michael H.**, Essentials of Supply Chain Management, Publisher: John Wiley & Sons; 3rd edition; **ISBN-10: 0470942185; ISBN-13: 978-0470942185**
- **Khan**, Handbook For Supply Chain Risk Management, **Published by Cengage Learning, ISBN 9788131521878**

*Bhushan Joshi*

**T.Y.B.Voc. (Green House Technology): Semester-VI**  
**GHT 625: Preparation of proposal for export of Agri goods**

**Total Hours: 60**

**Credits: 4**

**Course Objectives**

- To know agriculture marketing
- To know the importance of proposal making
- To know different channels of marketing
- To know about the warehousing and agri export

**Course outcomes**

Students will be able to

- Understand the agriculture marketing
- Understand the importance of proposal making
- Understand the different channels of marketing
- Understand the about the warehousing and agri export

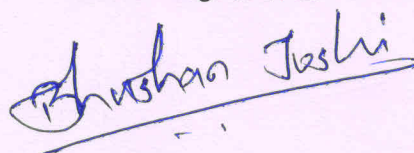
**Detailing of the syllabus -**

**Practical**

- Understanding of APEDA agriXchnage
- Understanding, listing of all required documents for export of Agri goods
- Flow chart of process of export
- Proposal for export of banana

**Reference books:**

- **Acharya, S. S. and N. L. Agarwal**, Agricultural Marketing in India, Oxford and IBH Publishing Company, 1987
- **Kohls Richard L**, Marketing of agricultural products, ISBN-13: 978-0130105844, ISBN-10: 0130105848
- **Norwood F. Bailey and Jayson Lusk**, Agricultural Marketing and Price Analysis, Publisher: Pearson, ISBN-10: 0132211211, ISBN-13: 978-0132211215



**T.Y.B.Voc. (Green House Technology): Semester-VI**

**GHT 626: Field Training**

**Total Hours: 60**

**Credits: 4**

**Course Objectives**

- To know field conditions
- To know the importance of firm
- To know different types of firms
- To know about the management of a firm

**Course outcomes**

Students will be able to

- Understand the field conditions
- Understand the importance of firm
- Understand the different types of firms
- Understand the about the management of a firm

**Detailing of the syllabus -**

Report of field training on following criteria:

- Introduction of firm
- Products of firm
- Production unit and its function in the firm
- Management of the firm
- Your observations

*Bhushan Joshi*