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

S.Y.B. Voc.

(Semester III & IV)

[w.e.f. Academic Year: 2020-21]

Program Specific Outcomes (PSO)

Students who graduate with B.Voc Green House Technology will

PSO1: Get six certificates for different job roles by Agriculture skill Council of India and cumulatively diploma, advanced diploma and degree in agriculture.

PSO2: Learn different subjects which are skill based as well as general and inter disciplinary which will help him to become an entrepreneur having essential and appropriate knowledge

PSO3: Acquire knowledge about the banking system and its operations along with investment instruments means students will be financially literate

PSO4: Understand the importance of communication skill and follow it

PSO5: Manage the data bank and other operations using computer

PSO6: Understand the irrigation management practices

PSO7: Understand the cultivation of flowers and vegetables in protected environment

PSO8: Understand the concept of integrated pest and disease management and how to do it in field

PSO9: Understand the role of natural resource management in productivity of an ecosystem

PSO10: Learn to do the biodiversity and resource mapping of a given area

PSO11: Learn harvest management

PSO12: Understand the Operation and control of Green House

PSO13: Learn Concept of Sustainable Development, organic farming and its components

PSO14: Understand the different food processing and preservation techniques

Course Structure: S.Y.B.Voc. Green House Technology

Duration: The duration of B.Voc. (Green House Technology) degree program shall be three years.

Green House Technology Semester III						
Component	**Paper Code**	**Paper**	**Mode**	**Credits**	**Marks**	**Hours per Week**
General	GHT 311	Financial literacy –I	Theory	2	100	2
General	GHT 312	Soft skills development - III	Theory	2	100	2
General	GHT 313	Financial literacy lab- I	Practical	4	100	8
General	GHT 314	Office operations lab - II	Practical	4	100	8
Skill	GHT 321	Irrigation management practices with special reference to micro irrigation (QP AGR/Q1002)	Theory	2	100	2
Skill	GHT 322	Cultivation of flowers and vegetables in protected environment	Theory	2	100	2
Skill	GHT 323	Integrated pest and disease management	Theory	2	100	2
Skill	GHT 324	Operation and control of micro irrigation system (QP AGR/Q1002)	Practical	4	100	8
Skill	GHT 325	Cultivation of selected crops	Practical	4	100	8
Skill	GHT 326	Identification of common pest and disease and its control	Practical	4	100	8
		Total		**30**	**1000**	**50**

Green House Technology Semester IV						
Component	**Paper Code**	**Paper**	**Mode**	**Credits**	**Marks**	**Hours per Week**
General	GHT 411	Natural resource management	Theory	2	100	2
General	GHT 412	Financial literacy -II	Theory	2	100	2
General	GHT 413	Biodiversity mapping, meteorological instruments	Practical	4	100	8
General	GHT 414	Financial literacy lab -II	Practical	4	100	8
Skill	GHT 421	Operation and control of green house (QP AGR/Q 1003)	Theory	2	100	2
Skill	GHT 422	Harvesting tools and Techniques of green house crops	Theory	2	100	2
Skill	GHT 423	Concept of sustainable development, organic farming and its components	Theory	2	100	2
Skill	GHT 424	Green house operations (QP AGR/Q 1003)	Practical	4	100	8
Skill	GHT 425	Harvesting and packaging	Practical	4	100	8
Skill	GHT 426	Preparation of different types of organic inputs	Practical	4	100	8
			Total	**30**	**1000**	**50**

DSC : Discipline Specific Elective Core Course
SEC : Skill Enhancement Course
GHT-YSC : Green House Technology (Y-year; S-Semester; C-Course number)

Examination Pattern for S.Y.B.Voc.

Examination	Marks
External Marks	**60**
Internal Marks	**40**
Total Marks	**100**

S.Y. B.Voc. Semester III (Green House Technology)
GHT- 311: Financial Literacy – I

Total Hours: 30 **Credits: 02**

Course Objectives:

- To know about the banking system
- To know about the Payment System
- To know about the different investment instruments

Course Outcomes:

Students will be able to

- Know about the banking systems and its functions
- Understand the payment system and how to operate it
- Understand the different investment instruments and its importance

Unit 1 - Banking **6h**

- Banking: concept, functions and structure of banking system in India
- Types of accounts: saving account, basic savings bank deposit account, current account, fixed deposit account & recurring deposit account; KYC: concept and process

Unit 2 - Payment System **8h**

- Payment: concept, types - cash, cheque, DD, card - debit, credit and prepaid, PoS, E-wallet, UPI, USSD NEFT, RTGS and IMPS
- NPCI;NACH: Concept and working

Unit 3 - Saving and investment **8h**

- Income: concept and types
- Expenditure: concept and types
- Saving v/s investment
- Interest rate,inflation impact, real interest rate
- Magic of compounding Interest

Unit 4 - Investment instruments **8h**

- Post office savings schemes
- National Savings Certificate; Kisan Vikas Patra
- EPF and PPF; RBI Bonds
- Financial records: concept, types and importance

References

1. Gutmann Andrew, (2013) How to Be an Investment Banker: Recruiting, Interviewing, and Landing the Job,John Wiley & Sons

2. RosenbaumJoshua, (2013) Investment Banking Workbook, Wiley; 1 edition **ASIN:** B00D0IK874
3. Mehra Dalip, Indian Banking Today. ArvindVivek Prakashan Agra. Book Code: AVP007
4. Iyengar Vijayaragavan, (2007) Introduction to Banking . Excel Books
5. Lekshmy Shekhar, (2013) Banking Theory & Practice. Arvind Vikas Publication
6. https://www.rbi.org.in/financialeducation/content/GUIDE310113_F.pdf
7. http://www.ncert.nic.in/departments/nie/dess/publication/prin_material/finance_reading_mate.pdf
8. https://www.sebi.gov.in/sebi_data/investors/financial_literacy/Financial%20Education%20for%20School%20Children.pdf

S.Y. B.Voc. Semester III (Green House Technology)
GHT 312: Soft Skills Development – III

Total Hours :30 **Credits: 02**

Course Objectives:

- To understand emotional intelligence and use of it in personality development
- To analyse the situation and person using SWOT analysis
- To understand the process of decision making and its components
- To learn time management skill and stress management skill
- To learn the work ethics

Course Outcomes:

Students will be able to

- Take good decision
- Be a confident person
- Manage the time to complete the task
- Mange the stress
- Maintain the work place ethics for better results

Unit 1- Emotional Intelligence **6h**

- Emotional Intelligence: Concept, importance
- Intelligent quotient and emotional quotient
- Components - Self-awareness, Self-regulation, Motivation, Empathy and Social skills
- Applying emotional intelligence at work

Unit 2 - Self Discovery **6h**

- Self Discovery: concept, importance and process

- Self Confidence and Self Esteem; SWOT analysis: concept, benefits and uses

Unit 3 - Decision Making **5h**

- Decision Making: concept and Importance
- Process and practical way of Decision Making
- Weighing Positives & Negatives

Unit 4 - Time Management **6h**

- Time management: concept and importance
- Hardwork v/s smart work, Tools of time management-Micro planning
- Goal setting: concept and importance, short term and long term goals
- steps for goal setting, SMART goals

Unit 5 - Stress Management **4h**

- Stress management; Factors causing stress
- Positive and negative stress, Effect of stress on body and mind, Stress removal techniques

Unit 6 - workplace ethics Hours: 03

Workplace Ethics: Concept and importance

Workplace Ethical Principles: trustworthiness, integrity, responsibility, accountability, loyalty, respect, Workplace Attendance

References

- Chester Eric, (2012) Reviving work ethics, Greenleaf Book Group Press; 1 edition
- Sharma Prashant, Soft Skills Personality Development for Life Success. BPB Publications
- Chauhan Gajendra Singh, (2015) Soft Skills: An Integrated Approach to Maximise Personality. Wiley India
- Ghosh B.N., Managing Soft Skills for Personality Development. Tata McGraw Hill India
- Alex K and S. Chand, Soft Skills (2009) Ethical Theory and Business, Tom L. Beauchamp, Norman E. Bowie and Denis Arnold
- CiullaJoanne et al, (2013) Honest work: A Business Ethics Reader, Oxford University Press; 3 edition,ISBN-10: 0199944202. ISBN-13: 978-0199944200

- **S.Y. B.Voc. Semester III (Green House Technology)**

GHT 313: Financial Literacy Lab-I

Total Hours: 60 **Credits: 04**

Course Objectives:

- To know the banking system and its operations

Course Outcomes:

Students will be able to

- Learn the banking operations like withdrawal and deposition of money in the account
- Learn to operate the transaction using NFET and RTGS

Practicals

01	Fill form for opening bank account offline & online
02	KYC form and documents required for opening account
03	Understand passbook and bank statement
04	Fill cash deposit slip
05	Fill cash withdrawal slip
06	Understand the cheque component and write cheque
07	Withdraw money through cheque
08	Understand demand draft components and fill demand draft form
09	Understand components of debit card and credit card
10	Fill NEFT & RTGS slip
11	Understand the interest rates of 2 public sector banks and 3 private sector bank
12	Calculate the simple and compound interest
13	Understand components of EPF statement

References:

- Gutmann Andrew, (2013) How to Be an Investment Banker: Recruiting, Interviewing, and Landing the Job, John Wiley & Sons
- Rosenbaum Joshua, (2013) Investment Banking Workbook, Wiley; 1 edition **ASIN:** B00D0IK874
- MehraDalip, Indian Banking Today. Arvind Vivek Prakashan Agra. Book Code: AVP007
- Iyengar Vijayaragavan, (2017) Introduction to Banking . Excel Books 2007
- Lekshmy Shekhar, (2013) Banking Theory & Practice. Arvind Vikas Publication
- https://www.rbi.org.in/financialeducation/content/GUIDE310113_F.pdf
- http://www.ncert.nic.in/departments/nie/dess/publication/prin_material/finance_reading_mate.pdf
- https://www.sebi.gov.in/sebi_data/investors/financial_literacy/Financial%20Education%20for%20School%20Children.pdf

S.Y. B.Voc. Semester III (Green House Technology)

GHT 314: Office Operations Lab – II

Total Hours: 60 **Credits: 04**

Course Objectives:

- To get acquainted with Excel operations
- To get acquainted with Power Point presentation

Course Outcomes:

Students will be able to

- Use excel for maintaining the record and analysis of data
- Use power point tool to make a presentation before the client

Practical

01 Getting know about spreadsheet software and its basic operations
02 Insert and arrange the data in spreadsheet software
03 Edit the data in spreadsheet software
04 Format the data in spreadsheet software
05 Prepare the charts in spreadsheet software
06 Use various formulae in spreadsheet software
07 Use of sort, filter and data tools
08 Insert pivot table in spreadsheet software
09 Page layout operations in spreadsheet software
10 Getting know about presentation software and its basic operations
11 Design the slide by using presentation program
12 Insert the data in the presentation by using presentation program
13 Apply the animations to slide by using presentation program

References:

- 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

S.Y. B.Voc. Semester III (Green House Technology)

GHT 321: Irrigation management practices with special reference to micro irrigation (QP AGR/Q1002)

Total Hours : 30 **Credits: 02**

Course Objectives :

- To understand the concept of irrigation and micro irrigation
- To know crop and water relationship
- To learn different methods of irrigation

Course Outcomes :

Students will be able to

- Understand the different water resources and irrigation practices
- Learn the Crop water requirement, delta calculation, scheduling of irrigation for different crops

- Understand participatory use of water

Unit 1: Introduction to irrigation **2h**

- Definition, objectives, different water resources and irrigation practices; National and local scenario

Unit 2: Crop and water **7h**

- Crop water requirement; evapo-transpiration; Delta calculation for different crops; scheduling of irrigation for different crops

Unit 3: Different methods of irrigation **7h**

- Traditional and advance methods

Unit 4: Irrigation efficiency and water use efficiency **9h**

- Determination of irrigation efficiency using conventional methods; water use efficiency, water productivity; improving efficiency and productivity based on ISE frame work

Unit 5: Conjunctive use of surface and ground water **5h**

- Concept and its understanding; participatory irrigation management; water user association - concept and its function

References

- Madan K. Jha V.V.N. Murty, (2013) "Land and Water Management Engineering", 6th Edition, Kalyani Publishers, ISBN: 978-9327214659
- D. Lenka, "Irrigation and Drainage", (2005), Kalyani Publishers, ISBN: 9788127224592
- Michael, A.M. Irrigation: Theory and practices. (1997) Vikas Publishing House Pvt Ltd, Delhi.
- U. S. Kadam, R. T. Thokal, S. D. Gorantlwar, (2008) "Agricultural Drainage: Principles And Practices", , Westville Publishing House.
- M. L. Choudhary, U. S. Kadam, 2016 "Micro-Irrigation For Cash Crops", , Westville Publishing House, ISBN: 9788185873282

S.Y. B.Voc. Semester III (Green House Technology)

GHT 322: Cultivation of flowers and vegetables in protected environment

Total Hours : 30 **Credits: 02**

Course Objectives:

- To introduce the status of cultivation of flower in Maharashtra and India
- To learn cultivation practices of selected flower species
- To learn cultivation practices of selected vegetables

Course Outcomes:

Students will be able to

- Understand the status of floriculture in Maharashtra and India
- Learn the cultivation practices of selected flower species
- Learn the cultivation practices of selected vegetables

Unit 1: Introduction **6h**

- Introduction to cultivation of flowers and vegetables in India and Maharashtra

Unit 2: Cultivation practices for selected flowers species **6h**

- Rose, Carnations, chrysanthemum; gerbera

Unit3: Cultivation practices for selected flowers species **6h**

- Gladiolus, tube rose, spider lily

Unit 4: Cultivation practices for selected vegetables **6h**

- Members of Solanaceae

Unit 5: Cultivation practices for selected vegetables **6h**

- Members of Cucurbitaceae

References

- Khader, Vijaya, (2013) "Text book of Food science and Technology", Indian Council of Agriculture Research, New Delhi, ISBN: 9788171641338
- Bose T.K. and Som M.G., (1990) Vegetable Crops in India, Naya Prokash ASIN: B009SQ0P4I
- Prem Nath, Velayadhan S. and Singh D. P., (2002) vegetables for the tropical region 2nd edition, Indian Council of Agricultural Research
- Hazra P. and Som M. G., (1999) Technology for vegetable production and improvement, Naya Prokash
- Singh S.P., (2012) Principles of Vegetable production, Agrotech Publications
- Thamburaj S and N. Singh (2014)Text book of Vegetable, Tuber Crops and Spices,ICAR
- Salunkhe D.K, Kadam S.S, 1995Handbook of fruit science and technology, CRC Press; 1 edition

S.Y. B.Voc. Semester III (Green House Technology)

GHT323: Integrated pest and Disease management

Total Hours: 30 **Credits: 02**

Course Objectives:

- To understand common pest and diseases
- To understand different methods of disease control
- To understand pesticides and its compatibility with other agro chemicals

- To understand handling and storage of pesticides and other chemicals

Course Outcomes:

Students will be able to

- Identify the major pests
- Learn the different methods of pest and disease control
- Use of pesticides with appropriate dosage and compatibility with others
- Control the pest and disease of some particular crops at least partially

Unit 1: Introduction to common pest and disease **7h**

- Classification and identification of major pest; classification and identification of major disease

Unit 2 : Methods of pest and disease control **7h**

- Chemical control; biological control; preventive measures, IPM

Unit 3 : Pesticides **7h**

- Formulations of pesticides and its dosages; compatibility of pesticides with other agro chemicals;

Unit: 4 Crop and diseases **7h**

- Specific crop pest and diseases: Rose, Carnations, chrysanthemum; gerbera, vegetables specifically of Cucurbitaceae and Solanaceae

Unit: 5 Handling and storage of pesticides and other chemicals **2h**

References :-

- David B. and V.V Ramamurthy , Elements of Economic Entomology -ISBN -13 9780994869104, Product code EBK0373688
- Dhaliwal G.S. and Arora R., Integrated Pest Management, Concepts and Approaches – Kalyani Publishers, ISBN 13 9788127231927
- Larry P. Pedigo, (2014) Entomology and Pest Management- Waveland Press,
- Nair, M. R. G. K., Insects and mites of crops in India (ICAR)
- Chari M. S. and Ramaprasad, Botanical Pesticides in integrated pest management - Indian Society of Tobacco Science, Central Tobacco Research Institute, Rajamundry. pp. 256-260.

S.Y. B.Voc. Semester III (Green House Technology)

GHT 324: Operation and control of micro irrigation system

(AGR/Q1002)

Total Hours : 60 **Credits: 04**

Course Objectives:

- To understand the components, assemblage and function of drip irrigation system

- To understand the components, assemblage and function of sprinkler system
- To understand the components, assemblage and function of fertilizer application system
- To understand the components, assemblage and function of foggers system

Course Outcomes:

Students will be able to

- Assemble the drip irrigation system
- Assemble the sprinkler system
- Assemble the fertilizer application system
- Assemble the foggers system
- Functioning of all above mentioned systems

Practicals

- Study of drip irrigation systems and its assembly
- Study of sprinkler system and its assembly
- Study of filtration unit and its components.
- Study of fertilizer application equipments
- Computation of fertilizer dose for fertigation
- Cleaning and maintenance of drip irrigation system
- Study of installation of foggers for controlling temperature
- Study of conventional method of irrigation

References

- Madan K. Jha V.V.N. Murty, (2013) "Land and Water Management Engineering", 6th Edition, , Kalyani Publishers, ISBN: 978-9327214659
- Lenka D., (2005), "Irrigation and Drainage", Kalyani Publishers, ISBN: 9788127224592
- Michael, A.M. Irrigation: Theory and practices. (1997) Vikas Publishing House Pvt Ltd, Delhi.
- Kadam U. S., Thokal R. T., Gorantlwar S. D., (2008) "Agricultural Drainage: Principles And Practices", Westville Publishing House.
- Choudhary M. L., Kadam U. S., (2016) "Micro-Irrigation For Cash Crops", , Westville Publishing House, ISBN: 9788185873282

S.Y. B.Voc. Semester III (Green House Technology)

GHT 325: Cultivation of selected crops

Total Hours : 60 **Credits: 04**

Course Objectives:

- To learn cultivation practices for different flowers
- To visit a poly house where flower or vegetables is under cultivation

Course Outcomes:

Students will be able to

- Learn cultivation techniques of HT roses and chrysanthemum
- Learn cultivation practices of vegetables of Solanaceae and Cucurbitaceae

Practicals

1. Cultivation of HT Roses
2. Cultivation of Chrysanthemum
3. Cultivation of vegetable of Solanaceae family
4. Cultivation of vegetable of Cucurbitaceae family
5. Visit to cut flower/ vegetable growing poly house and its beneficial aspects in terms of economics

Recommended Books:

- Tewari Deepali et al (2017) Production Technology of Vegetables and Flowers Write And Print Publications; 1 edition, **ISBN-10:** 8192970558
- Production Technology Of Vegetables & Flowers PDF Book, ICAR E course
- Larson A. Roy, (1992) Introduction to Floriculture, Academic Press; 2 edition

S.Y. B.Voc. Semester III (Green House Technology)

GHT-326: Identification of common pest and disease and its control

Total Hours :60 **Credits: 04**

Course Objectives :

- To identify the common pest and diseases and make an inventory of it
- To develop a field guide for identification for farmer
- To understand the information given on labels
- To get familiarity with safety articles

Course Outcomes:

Students will be able to

- Develop an inventory of common pest and diseases
- Develop a protocol for control of pest and disease
- Understand the information given on label
- Learn the use of safety articles

Practicals:

1. Inventory of common pest
2. Inventory of common diseases

3. Development of field guide for easy identification for farmer
4. Reading and understanding of labels on pesticides
5. Preparation of pesticides as per requirement/guideline
6. Demonstration and protocol of control of pest (at least 5)
7. Demonstration and protocol of control of disease (at least 5)
8. Use of safety articles

Recommended Books:

- David B. and V.V Ramamurthy , Elements of Economic Entomology -ISBN -13 9780994869104, Product code EBK0373688
- Dhaliwal G.S. and R. Arora, Integrated Pest Management, Concepts and Approaches – Kalyani Publishers, ISBN 13 9788127231927
- Larry P. Pedigo, Entomology and Pest Management- Waveland Press, 22-Dec-2014
- Nair, M. R. G. K., Insects and mites of crops in India (ICAR)
- Chari M. S. and Ramaprasad, (2009) Botanical Pesticides in integrated pest management - Indian Society of Tobacco Science, Central Tobacco Research Institute, Rajamundry. pp. 256-260.

S.Y. B.Voc. Semester IV (Green House Technology)

GHT-411: Natural Resource Management

Total Hours: 30 **Credits: 2**

Course Objectives:

- To know about natural resources in general
- To know about the forest, water and land as resources
- To introduce about GIS and its application in agriculture

Course Outcomes:

Students will be able to

- Understand the concept of natural resource management and its importance
- Understand the water as important resource and its use
- Understand the concept of dry land and water management
- Understand basic concept of GIS and its application in agriculture

Unit 1: Introduction to Natural Resource **6h**

- Concept of resource; classification of natural resources; Inter relationships among different types of natural resources. Ecological, social and economic dimension of resource management.

Unit 2: Forest Resource **6h**

- Forest vegetation, status and distribution, major forest types and their characteristics, deforestation, Afforestation, Forest and tribal people, Forest management. Forest produce; biodiversity: concept and importance; biodiversity hot spot

Unit 3: Water Resource **9h**

- Water Resources: water and it's importance; the hydrological cycle and its components, drainage systems, classification of water resources, Surface run-off, stream flow estimation, problems of water and ground water resource depletion, watershed types and Functions; Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. Water and agriculture

Unit 4: Land Resources **6h**

- Types of land; land used pattern, dry land and its characteristics; Land and water management in relation to agriculture

Unit 5: GIS and its application **3h**

- Understanding of GIS ; Use of Geoinformatics in agriculture

References

- MisraHarikesh, Managing Natural Resources, focus on land and water PHI Learning ISBN: 9788120349339, 8120349334
- Pandey B.W, (2005), Natural Resource Management, Mittal Publication 8170999863, 9788170999867
- Taylor R.D et al, (2011) Natural Resource Management and local people, , Springer ISBN 978-94-007-0173-1
- Nuberg I et al, Agroforestry for natural resource management CSIRO Publishing Australia ISBN : 9780643092242
- Bhat Saligram, Water Resources Management, APH Publishing Corporation (2012), ISBN-10: 9331316844ISBN-13: 978-9331316844
- Rodolfo Soncini-Sessa Enrico Weber Andrea 2012 CastellettiIntegrated and Participatory Water Resources Management - Theory, Volume 1a Elsevier Science

S.Y. B.Voc. Semester IV (Green House Technology)

GHT -412 Financial Literacy – II

Total Hours : 30 **Credits: 02**

Course Objectives:

- To understand tax system
- To understand mutual funds
- To understand insurance

Course Outcomes:

Students will be able to

- Understand tax system in general and GST
- Learn about the financial market
- Learn about the mutual funds and insurance

Unit 1 - Tax System **8h**

- Tax: Concept and role of tax in nation building
- Tax structure - direct and indirect
- Income tax, Income tax slabs and income tax returns; CESS and surcharge
- GST: Concept, types - CGST, SGST and IGST, advantages and disadvantages

Unit 2 - Financial market **8h**

- Financial market: concept, function and types- money market and capital market
- Money market instruments: Treasury bill, commercial paper, call money, certificate of deposit and commercial bill; Capital markets: functions, types: primary & secondary market
- Stock Market: concept, functions, types - BSE and NSE; Commodity stock market: MCX

Unit 3 - Mutual Fund **8h**

- Mutual fund: concept, advantages and types – equity, debt and balanced
- Open ended fund v/s closed ended fund; Growth plan v/s dividend plan
- Regular plan v/s direct plan; SIP, SWP and STP

Unit 4 - Insurance **6h**

- Insurance: concept, need and working
- Types of insurance – Life, General and Health
- Types of life insurance policies – term plan, whole life protection plan, Endowment Plan, money back plan, child plan and ULIP; Government insurance Schemes: PMJJBY and PMSBY

References

- Gutmann Andrew, (2013) How to Be an Investment Banker: Recruiting, Interviewing, and Landing the Job, John Wiley & Sons
- Rosenbaum Joshua, (2013) Investment Banking Workbook, Wiley; 1 edition **ASIN:** B00D0IK874
- MehraDalip, Indian Banking Today. Arvind Vivek Prakashan Agra. Book Code: AVP007
- Iyengar Vijayaragavan, (2007) Introduction to Banking . Excel Books
- Lekshmy Shekhar, (2013) Banking Theory & Practice. Arvind Vikas Publication
- https://www.rbi.org.in/financialeducation/content/GUIDE310113_F.pdf

- http://www.ncert.nic.in/departments/nie/dess/publication/prin_material/finance_reading_mate.pdf
- https://www.sebi.gov.in/sebi_data/investors/financial_literacy/Financial%20Education%20for%20School%20Children.pdf

S.Y. B.Voc. Semester IV (Green House Technology)

GHT-413: Biodiversity mapping, meteorological instruments

Total Hours: 60 **Credits: 04**

Course Objectives:

- To understand the localbiodiversity
- To understand the water availability and requirement

Course Outcomes:

Students will be able to

- Map natural resources of a given area
- Map biodiversity of a field or given area
- Calculate the surface run off
- Prepare a water budget of given field

Practicals:

- Mapping of natural resources of a given area
- Biodiversity mapping of an agricultural field
- Water budget of a given crop in a field of one acre
- Estimation of humidity using Dry and Wet bulb thermometer
- Calculation of surface run off
- Calculation of water requirement of a field for given crop using different types of irrigation system

Reference

- Misra Harikesh, Managing Natural Resources, focus on land and water PHI Learning ISBN: 9788120349339, 8120349334
- Pandey B.W, 2005, Natural Resource Management, Mittal Publication 8170999863, 9788170999867
- Taylor R.D et al, (2011), Natural Resource Management and local people, Springer ISBN 978-94-007-0173-1
- Nuberg I et al, Agroforestry for natural resource management CSIRO Publishing Australia **ISBN:** 9780643092242
- Bhat Saligram, (2012), Water Resources Management, APH Publishing Corporation ISBN-10: 9331316844 ISBN-13: 978-9331316844
- Rodolfo Soncini-Sessa Enrico Weber Andrea Castelletti (2012) Integrated and Participatory Water Resources Management - Theory, Volume 1a Elsevier Science

S.Y. B.Voc. Semester IV (Green House Technology)
GHT -414: Financial Literacy Lab - II

Total Hours : 60 **Credits: 04**

Course Objectives:

- To impart financial literacy

Course Outcomes:

Students will be able to

- Understand different documents/form related to finance
- Calculate income tax at least partially
- Apply for PAN card online

Practicals

01	Understand components of salary slip
02	Calculate income tax as per tax slab
03	Use of online income tax calculator
04	Understand components of Form 16
05	Understand components of form 26AS
06	Understand components of ITR-V record
07	Apply for PAN card online
08	Understand and find HSN code and Calculate GST for items
09	Calculate NAV
10	Calculate absolute returns and annualized returns
11	Understand components of mutual fund statement
12	Fill the form for PMJJBY and PMSBY

Reference

- Gutmann Andrew, (2013) How to Be an Investment Banker: Recruiting, Interviewing, and Landing the Job, John Wiley & Sons
- Rosenbaum Joshua, (2013) Investment Banking Workbook, Wiley; 1 edition **ASIN:** B00D0IK874
- Mehra Dalip, Indian Banking Today. Arvind Vivek Prakashan Agra. Book Code: AVP007
- Iyengar Vijayaragavan, (2007) Introduction to Banking . Excel Books
- K.C. &Lekshmy Shekhar, (2013) Banking Theory & Practice. Arvind Vikas Publication 2013
- https://www.rbi.org.in/financialeducation/content/GUIDE310113_F.pdf
- http://www.ncert.nic.in/departments/nie/dess/publication/prin_material/finance_reading_mate.pdf
- https://www.sebi.gov.in/sebi_data/investors/financial_literacy/Financial%20Education%20for%20School%20Children.pdf

S.Y. B.Voc. Semester IV (Green House Technology)

GHT-421: Operation and control of Green House
(QP AGR/Q 1003)

Total Hours: 30 **Credits: 02**

Course Objectives:

- To understand the green house concept and structure
- To understand operations of green house

Course Outcomes:

Students will be able to

- Learn the different types and components of green house
- Learn the operations of green house
- Learn the inter culture operations in the green house

Unit: 1 Know your green house **7h**

- understanding of various components and its function of greenhouse: galvanized structure, covering, cooling system, exhaust fan, heating system, motorized shading net/ thermal net, fogging/sprinkler system, drip system, control panel, motorized ventilation etc.,

Unit: 2 Environmental control **7h**

- Monitoring and controlling temperature; ventilation, control of humidity, control of CO2 and sunlight and data keeping

Unit 3 : Operations of green house **7h**

- Preparation of different growth media; procurement and stoarge of different plant meterial; plantation, labelling of plants and their grouping; understanding of plant growth; irrigation and fertilizer and manure application

Unit 4 : Inter culture operations **7h**

- Thinning, weeding, pruning, support system; special horticultural practices for selected flowers (Rose, Carnations, chrysanthemum; gerbera, and vegetables specifically of Cucurbitaceae and Solanaceae

Unit5: **Health and safety measures** **2h**

References

- Castilla Nicolas, (2012) Greenhouse Technology and Management, Agricultural Research and Training Institute, Andalucía, Spain
- Authors Cecilia et al. (2019) Greenhouse horticulture: Technology for optimal crop production, Wageningen Academy publishers, , ISBN: 978-90-8686-329-7
- Tiwary G.N. (2009) GoelGreenhouse Technology – Narosa ISBN-10: 817319498X

- Hanan, J.J., Holley, W.D., Goldsberry, K.L, .Greenhouse Management ISBN 978-3-642-66778-7
- KothariSurendra, (2006) Greenhouse: Science and Technology, Himanshu Publications
- Marshall Roger, (2006) How to Build Your Own Greenhouse: Designs and Plans to Meet Your Growing Needs, Storey Pub., ISBN 1580175872, 9781580175876

S.Y. B.Voc. Semester IV (Green House Technology)

GHT-422: Harvesting Tools and Techniques of Green House Crops

Total Hours : 30 **Credits: 02**

Course Objectives:

- To understand the use of various harvesting tools and techniques of green house crops
- To understand packaging techniques and tools

Course Outcomes:

Students will be able to

- Learn the different types of harvesting tools of green house crops
- Learn the harvesting techniques of green house crops
- Learn the packaging techniques of green house crops

Unit 1: Introduction to harvest **6h**

- Major harvesting tools and design aspects; harvesting indices of various crops grown under green house; Factors responsible for harvesting,

Unit 2: Harvesting techniques **6h**

- Harvesting techniques for reduction of food losses and quality parameters

Unit 3: Post harvest handling and care **6h**

- Post harvest handling and care viz., washing, precooling,cutting,drying,sorting , grading etc

Unit 4: Packaging **6h**

- Packaging of harvested crops - pre packaging and post packaging, packaging material and various methods of packaging

Unit 5: Storage **6h**

- Types of storage; crop specific storage methods in selected fruits, vegetables and flowers

References

- Lal G. and Siddhapa, Fruit and Vegetable preservation. ICAR 2009, ISBN 10-8171640907
- Gupta Sudhir et al, Food Processing AndAgro-Based Industries 2nd Edition, 2012, Small Industry Research InstituteEngineers India Research Institute

- CruessW.V., Commercial fruits and vegetables products -.2009 AGROBIOS
- PeterK.V. (Ed.), Post harvest technology of Horticulture Crops, New India Publishing Agency, 2007
- Srivastava R. P. & Kumar Sanjeev, Fruit and Vegetable Preservation, Principles and practices - International Book Distributing Company, 30-Nov-2002

S.Y. B.Voc. Semester IV (Green House Technology)

GHT-423: Concept of Sustainable Development, organic farming and its components

Total Hours : 30 **Credits: 02**

Course Objectives:

- To understand concept of sustainable development
- To understand different methods of organic farming and its concept
- To understand the components of organic farming and sustainable development

Course Outcomes:

Students will be able to

- Learn the concept of sustainable development
- Learn the different components of sustainable development
- Learn the concept of organic farming
- Use the components of organic farming and sustainable development

Unit 1: Introduction to sustainable development and organic farming 6h

- Sustainable agriculture: definition and concept; agriculture sustainability; causes of reduction in soil fertility; principles of organic farming; components of organic farming; scope, need and opportunities

Unit 2: Planning for organic farming 6h

- Different types of farming system and their role for agri ecosystem; Cropping system; crop rotation; characteristics of Good Agricultural Practices (G.A.P), Natural Farming, Organic Farming, Zero Till Farming; the effects of specific chemicals on health and environment ; use of natural source

Unit 3:Seed selection and treatment under organic farming 6h

- Selection of crop and its companion crop; selecting suitable seed variety; seed treatment;

Unit 4:Weed, pest and nutrient management in organic farming 6h

- Identification of weeds and its management by using different means; application of nutrient as per the need;

Unit 5: Integrated Pest and Disease Management under organic farming 6h

- Prevention practices and monitoring; curative methods

References

- Sarath Chandran , (2018) "Organic Farming" 1st Edition, , Woodhead Publishing, ISBN 9780128132722
- Gurbir Bhullar Navreet Bhullar, (2012) "Agricultural Sustainability", 1st Edition, Academic Press. ISBN: 9780124045606
- Kimberly Etingoff , (2016) "Sustainable Development of Organic Agriculture-Historical Perspectives", Apple Academic Press , New York, ISBN: 9781771884846
- SharmaJ.P., (2005) "Fundamental Approaches in sustainable agriculture", Kalyani Publishers, ISBN 978-8127225186
- Behera U.K., (2014) "A Textbook of Farming Systems" Agrotech Publishing Academy

S.Y. B.Voc. Semester IV (Green House Technology)

GHT-424: Green house operations (QP AGR/Q 1003)

Total Hours : 60 **Credits: 04**

Course Objectives:

- To understand function and maintenance of components of green- house
- To perform all activities from selection of planting material to harvest

Course Outcomes:

Students will be able to

- Learn function and maintenance of various components of green house
- Learn the selection of best planting material
- Learn to prepare schedule and act accordingly
- Learn to keep the records

Practical:

- To understand, function and maintenance of various components of greenhouse viz.,:
    - galvanized structure,
    - covering or cladding material
    - Cooling system, exhaust fan, heating system,
    - fogging/sprinkler system, drip system,
    - control panel, motorized ventilation
- Identification, sorting and grading of planting material as per need
- To prepare the growing schedule of selected crop inclusive of fertigation, preventive measures of pathogens, harvest etc
- To prepare and maintain the green house register
- To control the environment in the greenhouse and maintenance of temperature, humidity according to the type of crop
- To identify the Pesticide/ Insecticide for particular pathogen
- To maintain cleanliness, hygiene and safety measures followed in Green House.

Reference

- Castilla Nicolas, (2012) Greenhouse Technology and Management, Agricultural Research and Training Institute, Andalucía, Spain
- Authors Cecilia et al. (2019) Greenhouse horticulture: Technology for optimal crop production, Wageningen Academy publishers, ISBN: 978-90-8686-329-7
- Tiwary G.N. & R.K. Goel (2009) Greenhouse Technology – Narosa ISBN-10: 817319498X
- Hanan, J.J., Holley, W.D., Goldsberry, K.L, .Greenhouse Management ISBN 978-3-642-66778-7
- Kothari Surendra, (2006) Greenhouse: Science and Technology, Himanshu Publications
- Marshall Roger, (2006) How to Build Your Own Greenhouse: Designs and Plans to Meet Your Growing Needs, Storey Pub., ISBN 1580175872, 9781580175876

S.Y. B.Voc. Semester IV (Green House Technology)

GHT-425: Harvesting and packaging

Total Hours : 60 **Credits:04**

Course Objectives:

- To learn handling of harvesting tools
- To learn harvesting indices
- To understand different types of packaging material and methods

Course Outcomes:

Students will be able to

- Handle harvesting tools
- Prepare harvesting indices chart
- Handle the post-harvest products
- Learn functioning of a cold storage and its function during field visit

Practical:

- Introduction to harvesting tools and their design aspect
- Harvesting methods of vegetable crops
- Harvesting methods of flowering crops
- Harvesting indices of vegetable crops grown under green house
- Harvesting indices of flowering crops grown under green house
- Post harvest handling and care of vegetable crops
- Post harvest handling and care of flowering crops
- Drying and dehydration of vegetables
- Drying of various flowers
- Packaging of harvested vegetable crops (perishable):Packaging material and various methods of packaging

- Packaging of harvested flowers: packaging material and various methods of packaging
- Storage techniques for vegetable crops: storage techniques for flower crops
- Field visit - cold storage , ripening chamber

Recommended Books & Links:

- Lal G. and Siddhapa, (2009) Fruit and Vegetable preservation. ICAR ISBN 10-8171640907
- Gupta Sudhir et al, (2012) Food Processing AndAgro-Based Industries 2nd Edition, Small Industry Research Institute Engineers India Research Institute
- CruessW.V., (2009) Commercial fruits and vegetables products -.AGROBIOS
- PeterK.V. (Ed.), (2007) Post harvest technology of Horticulture Crops, New India Publishing Agency,
- Srivastava R. P. & Kumar Sanjeev, (2002) Fruit and Vegetable Preservation, Principles and practices - International Book Distributing Company

S.Y. B.Voc. Semester IV (Green House Technology)
GHT-426: Preparation of different types of organic Inputs

Total Hours : 60 **Credits: 04**

Course Objectives:

- To learn cultivation of bio fertilizer
- To learn preparation of vermicompost pit and its product

Course Outcomes:

Students will be able to

- Learn cultivation and multiplication of biofertilizers
- Learn to prepare vermicompost and other products
- Learn to prepare boatanical preparations and its applications

Practicals:

- Cultivation of Azolla as bio fertilizer
- Multiplication of Blue Green Algae
- Preparation of Vermicompost pit
- Preparation of vermi compost and vermi wash
- Packing, Handling and storage of compost
- Preparation and application of jivamrut
- Preparation and application of bijamrut
- Visit to Organic Farm to study the various components and their utilization

Recommended Books & Links:

- Sarath Chandran, "Organic Farming" 1st Edition, 2018, Woodhead Publishing, ISBN 9780128132722
- Gurbir Bhullar Navreet Bhullar, (2012) "Agricultural Sustainability",1st Edition, Academic Press. ISBN: 9780124045606

- Kimberly Etingoff, (2016) "Sustainable Development of Organic Agriculture-Historical Perspectives", 1st Edition, Apple Academic Press , New York, ISBN: 9781771884846
- Sharma J. P., (2005) "Fundamental Approaches in sustainable agriculture", 1st Edition, Kalyani Publishers, ISBN 978-8127225186
- Behera U. K., (2014) "A Textbook of Farming Systems", Agrotech Publishing Academy

Skill imparted: The program is skill based

Job Opportunity:

The student will qualify at least two QPs and assessment will be done by Agriculture skill Council of India every year.

At the end of every year the student will be well equipped in appropriate job role.

Student can use his knowledge and skill and become an entrepreneur or can serve in soil and testing lab, in any NGO, or even in any agri input shop.

Students can develop their own poly house and become entrepreneur