Estd. 1962
"A++" Accredited by NAAC (2021)
With CGPA 3.52

SHIVAJI UNIVERSITY, KOLHAPUR
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Web : www.unishivaji.ac.in Email: bos@unishivaji.ac.in
शिवाजी विद्यापीठ, कोल्हापूर, ४१६ ००४, महाराष्ट्र
दूरध्वनी - इपीबीएक्स - २०६०९०००, अभ्यासमंडळे विभाग : ०२३१- २६०९०९४, २६०९४८७
वेबसाईट : www.unishivaji.ac.in ईमेल : bos@unishivaji.ac.in

Ref.: SU/BOS/ *IDS* /564 **Date: 18 - 09- 2025**

To,

The Principal,
All Concerned Affiliated Colleges/Institutions
Shivaji University, Kolhapur

Subject : Regarding revised syllabi of **B. Voc. Part I (Sem. I & II)** degree programme under the Faculty of Inter- Disciplinary Studies as per NEP-2020 (2.0).

Sir/Madam,

With reference to the subject mentioned above, I am directed to inform you that the university authorities have accepted and granted approval to the revised syllabi, nature of question paper and equivalence of **B. Voc. Part I (Sem. I & II)** for follower's degree programme under the Faculty of Inter- Disciplinary Studies as per National Education Policy, 2020 (NEP 2.0).

Course
B. Voc. Automobile Part - I
B. Voc. Sustainable Agriculture Part - I
B. Voc. Food Processing Technology Part - I
B. Voc. Graphic design Part -I
B. Voc. Sustainable Agriculture Management Part -I
B. Voc. Nursing and Hospital Management Part -I
B. Voc. Tourism and Service Industry Part - I

This syllabus, nature of question and equivalence shall be implemented from the academic year **2025-2026** onwards. A soft copy containing the syllabus is attached herewith and it is also available on university website www.unishivaji.ac.in NEP-2020 (Online Syllabus)

The question papers on the pre-revised syllabi of above-mentioned course will be set for the examinations to be held in October /November 2025 & March/April 2026. These chances are available for repeater students, if any.

You are, therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Yours Faithfully

(Dr. S. M. Kubal)
Dy Registrar

Encl. : As above.

Copy to: For Information and necessary action.

1	The Dean, Faculty of IDS	7	Affiliation T. 1 & T. 2 Section
2	Director, Board of Examination and Evaluation	8	Appointment A & B Section
3	The Chairman, Respective Board of Studies	9	P.G.Seminar Section
4	All On Exam Section	10	I.T. Cell
5	Eligibility Section	11	Internal Quality Assurance Cell (IQAC)
6	P. G. Admission Section		

Shivaji University, Kolhapur

Established: 1962

Accredited By NAAC with 'A++' Grade with

CGPA 3.52

Revised Syllabus for

Bachelor of Vocation [B. Voc.] (NEP-2.0)

Part-I

Sustainable Agriculture Management

UNDER

Faculty of Interdisciplinary Studies Structure, Scheme and Revised Syllabus

(To be implemented from academic year 2025-26 onwards)

Shivaji University, Kolhapur

NEP-2020 (2.0): Credit Frame work for UG B. Voc.- I Program Under Faculty of Interdisciplinary Studies

B. Voc. Part I Sustainable Agriculture Management

Level	Semester	COURSES			OE	VSC/ SEC	AEC/VEC/IKS	OJT/FP/ CEP/ CC/ RP	Total Credit
		Course –I	**Course -II**	**Course -III**			IKS		
4.5	I	DSC-I (2) DSC-II (2) DSC Pract. I (2)	DSC-I (2) DSC-II (2) DSC Pract. I (2)	DSC-I (2) DSC-II (2) DSC Pract.I (2)	OE -I (T) (2)		IKS-I (2) Introduction to IKS		
	Credits	**4+2=6**	**4+2=6**	**4+2=6**	**2**		**2**		**22**
	II	DSC-III (2) DSC-IV (2) DSC Pract. II (2)	DSC – III (2) DSC-IV (2) DSC Pract.II(2)	DSC-III (2) DSC-IV (2) DSC Pract.I(2)	OE-II (T) (2)		VEC-I (2) (Democracy, Election and constitution)		
	Credits	**4+2=6**	**4+2=6**	**4+2=6**	**2**		**2**		**22**
1st Year Cum. Credits		**8(T)+4(P)= 12**	**8(T)+4(P)= 12**	**8(T)+4(P)= 12**	**2+2 =4**		**2 + 2= 4**		**44**
Exit Option: Award of FY Diploma Certificate with 44 Credits									

Semester- I B. Voc.- Sustainable Agriculture management

Sem.	Course	Code	Paper No.	Title of Paper
I	I	DSC- I	B. Voc. Paper- I	Soil Science
		DSC- II	B. Voc. Paper- II	Agronomic Crops
		DSC- P- I	B. Voc. Practical –I	Based upon DSC-I and DSC- II
	II	DSC- I	B. Voc. Paper- I	Horticulture
		DSC- II	B. Voc. Paper- II	Biodiversity Conservation
		DSC- P- I	B. Voc. Practical –II	Based upon DSC-I and DSC -II
	III	DSC- I	B. Voc. Paper- I	Agricultural Economics
		DSC- II	B. Voc. Paper- II	Fundamental of Entomology
		DSC- P- I	B. Voc. Practical –III	Based upon DSC – I and DSC - II
	OE -I	Open Elective	Theory (2)	Biofertilizers and Biopesticides
	IKS	Indian Knowledge System	Theory (2)	IKS (Generic)

Semester- II B. Voc.- Sustainable Agriculture management

Sem.	Course	Code	Paper No.	Title of Paper
II	I	DSC- I	B. Voc. Paper- I	Green Technology in Agriculture
		DSC- II	B. Voc. Paper- II	Techniques in Supporting Agriculture
		DSC- P- I	B. Voc. Practical- I	Based upon DSC -I and DSC-II
	II	DSC- I	B. Voc. Paper- I	Nursery Management
		DSC- II	B. Voc. Paper- II	Agribisiness Management
		DSC- P- I	B. Voc. Practical- II	Based upon DSC – I and DSC - II
	III	DSC- I	B. Voc. Paper- I	Production Management of Agricultural Crops
		DSC- II	B. Voc. Paper- II	Modern Farming Systems in Sustainable Agriculture
		DSC- P- I	B. Voc. Practical-III	Based upon DSC – I and DSC - II
	OE -II	Open Elective - II	Theory (2)	Food Preservation
	VEC	Value Education Course	Theory (2)	Democracy, Election and Good Governance

Eligibility:

Eligibility for Admission: For Diploma: 10 + 2 from any faculty / ITI / MCVC or equivalent

For Advance Diploma: Diploma or equivalent in any related stream.

Eligibility for Faculty: 1) Post Graduate with NET / SET/Ph. D. Or

1) Five Year Industry Experienced Personal

2) M. A. (English) with NET/SET for Business Communication

Eligibility for Lab Assistant: Graduation with related field

Staffing Pattern: Teaching:

- In the 1st year of B. Voc. – One Full Time one C. H. B. for Business Communication
- Lab. Assistant: For 1st Year of B. Voc.– 1 Part Time For 2nd and 3rd Year (Inclusive of 1st Year) of
- B. Voc.– 1 Full Time.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part- I Sem. I: Sustainable Agriculture Management, NEP 2020

(2.0) (Course - I) DSC– I B. Voc. Paper I

SOIL SCIENCE

Theory: 30 Hours

(Credits: 02)

Unit: 1 Fundamental Parameter of soil (8 hours)

Soil as a natural body, pedological and edaphological concepts of soil. Soil genesis: soil forming rocks and minerals. Weathering, processes and factors of soil formation; Soil Profile, components of soil; Soil physical properties: soil-texture, structure, density and porosity, soil colour, consistence and plasticity.

Unit: 2 Soil forming Factors (7 hours)

Soil Science: Introduction, soil forming factors, parent material, characteristics of soil, Classification, Organic matter and humus. Minerals: Definition, and classification mineral composition of rocks, physical properties of minerals chemical properties, silicate class, carbonate class, sulphide, phosphate, element class, organic halide oxide class

Unit: 3 Physical Factors of Soil (8 hours)

Classification and soils of India; Soil water retention, movement and availability; Soil air, composition, gaseous exchange, problem and plant growth, Soil temperature; source, amount and flow of heat in soil; effect on plant growth, Soil reaction-pH, soil acidity and alkalinity, buffering, effect of pH on nutrient availability

Unit: 4 Composition of soil (7 hours)

soil organic matter: composition, properties and its influence on soil properties; humic substances - nature and properties; soil organisms: macro and micro-organisms, their beneficial and harmful effects; Soil pollution - behavior of pesticides and inorganic contaminants, prevention and mitigation of soil pollution

Reference Books:

1. Mahajan, Latre: Soil Science at a glance, New Vishal Publications.
2. Dilip Kumar Das- Introductory Soil Science, Kalyani Publications.
3. Brady N.C. The Nature and Properties of Soils
4. ICAR.2006. Hand book of Agriculture, ICAR, New Delhi.
5. Dilip Kumar Das. Introductory Soil Science
6. Dr Smita Diwase Indian Agriculture and Agribusiness Management (3rd Edition)
7. Mark Shepard. Restoration Agriculture: Real-world Permaculture for Farmers.
8. T.D. Biswas, A Text Book of Soil Science – Indian Society of Soil Science.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I Sem. I: Sustainable Agriculture Management, NEP 2020 (2.0)

(Course - I) DSC– II B. Voc.- Paper II

AGRONOMIC CROPS

Theory: 30 Hours

(Credits: 02)

Unit: 1 Cereal Crops (8 hours)

Identification, morphology, agronomic conditions, seasons, growing season, diseases and hybrid varieties of following crops:

1. Wheat
2. Jowar
3. Rice
4. Maize

Unit: 2 Leguminous crops (7 hours)

Identification, morphology, agronomic conditions, seasons, growing season, diseases and hybrid varieties of following crops:

1.Pigeon pea

2.Cheek pea

3.Horse Gram

4.Black Gram

Unit: 3 Oil seed crops (8 hours)

Identification, morphology, agronomic conditions, seasons, growing season, diseases and hybrid varieties of following crops:

1.Groundnut

2.Sunflower

3. Soybean

4. Mustard

Unit: 4 Economic Important Crops (7 hours)

Identification, morphology, agronomic conditions, seasons, growing season, diseases and hybrid varieties of following crops:

1.Sugarcane

2.Cotton

Reference Books:

1. De, G.C.1989.Fundamentals of Agronomy. Oxford & IBH Publishing Co., New Delhi
2. ICAR.2006. Hand book of Agriculture, ICAR, New Delhi.
3. Reddy. T.Y. and Reddy, G.H.S.1995.Principles of Agronomy, Kalyani Publishers, Ludhiana.
4. K. S. Yawalkar, J. P. Agrawal and S. Bokde Manures and Fertilizers-
5. T.Y. Reddy and Reddy Principles of New Agronomy, Kalyani Publications.
6. Arun Katyayan, Fundamentals of Agronomy, Springer Publications.
7. R. Prasad, Text book of Agronomy, Springer Publications.
8. Raghvendra Singh, Vipul, Abhineet: Concept of Agronomy, Book Rivers Publication.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I Sem. I: Sustainable Agriculture Management, NEP 2020
(2.0) (Course - I) DSC– Practical B. Voc. Paper III
Soil Science and Agronomic Crops: (Practical)
(Credits: 02)

List of Practical's:

Group - I

1. Collection and processing of soil for analysis.
2. Study of soil profile and its characteristics
3. Determination of densities of soil.
4. Determination of moisture content from soil and plant.
5. Determination of maximum water holding capacity (MWHC) of soil.
6. Determination of hydraulic conductivity of Soil.
7. Determination of texture of soil
8. Study of soil forming rocks.

Group - II

1. Sowing methods of wheat.
2. Sowing methods of sugarcane.
3. Study of yield contributing characters of rabi season crops.
4. Yield and juice quality analysis of sugarcane
5. Study of important agronomic experiments of rabi crops at experimental farms.
6. Study of oil extraction.
7. Study of morphological characteristics of rabi crops.
8. Visit to research stations of related crops.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I Sem. I: Sustainable Agriculture Management, NEP 2020

(2.0) (Course - II) DSC– I, B. Voc.- Paper- I

Horticulture

Theory: 30 Hours

(Credits: 02)

Unit: 1 Introduction to Horticulture (8 hours)

Economic importance and classification of horticultural crops and their culture and nutritive value, area and production, exports and imports, fruit and vegetable zones of India and of different states, Principles and methods of pruning and training of fruit crops, types and use of growth regulators in horticulture, water management, weed management, fertility management in horticultural crops, cropping systems, intercropping, multi-tier cropping, mulching, bearing habits, factors influencing the fruitfulness and unfruitfulness.

Unit: 2 Techniques in Horticulture (7 hours)

Vegetative propagation in horticulture, Grafting, Air layering and Budding techniques soil and climate, vegetable gardens, nutrition and kitchen garden and other types of gardens – principles, planning and layout, management of orchards, planting systems and planting densities.

Unit: 3 Pomology and Floriculture (8 hours)

Pomology refers to cultivation of fruits & Floriculture refers to cultivation of flowers. The method of cultivation & intercultural operations & tillage practices.

4 **Unit: 4 Management in Horticulture (7 hours)**

Management of water, nutrient and weeds, special horticultural techniques including plant growth regulators, their solution preparation and use in commercial orchards. Physiological disorders. Post-harvest technology, harvest indices, harvesting methods, grading, packaging and storage of the following crops. Mango, banana, bael, banana, grapes, citrus, papaya, sapota, guava, pineapple, jackfruit,

Reference Books:

1. Denixon, RI. 1979. Principles of Horticulture. Mac Millan, New York.
2. Hartmann, HT. and Kester, DE. 1986.Plant propagation – Principles and practices. Prentice-Hall, New Delhi.
3. Chadha, K. L. 2003. Handbook of Horticulture, ICAR, New Delhi. Choudhury, B.1983. Vegetables. National Book Trust, New Delhi.
4. Biodiversity conservation: 101, by by Amelia Chiles, Eleanor J. Sterling, Georgina Cullman, and Melina Laverty 5. Exploring Agrodiversity -Book by H. Brookfield and Harold Brookfield.
5. Eerati Sathyanarayana, Floriculture and Landscaping Published by Science Technology-jain brothers.
6. Jitendra Singh, Fundamentals of Horticulture. Kalyani Publications.
7. V. Kumaresan, N. Arumugam. Book- Horticulture and Plant Breeding, SarasS Publications.
8. K. Gopal, M. Ramaiah. Pomology- A Glimpse, AkiNik Publications.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I Sem. I: Sustainable Agriculture Management, NEP 2020
(2.0) (Course - II) DSC– II B. Voc. Paper- II
Biodiversity Conservation
Theory: 30 Hours
(Credits: 02)

Unit: 1 Introduction to Biodiversity conservation (8 hours)

Objectives and advantages of biodiversity conservation, Types of conservation, convention of biological diversity, major cause for diversity loss, Environment, and Natural Resources.

Unit: 2 In situ Biodiversity conservation (7 hours)

In situ Biodiversity conservation strategies and approaches: Protected areas, biosphere resource, protected areas in India ◆ Sanctuaries, national parks and biosphere resources. Ex Situ Biodiversity conservation: Species management plans, captive breeding, field gene banks, seed gene banks, cryopreservation, gene banks. National and international efforts for biodiversity conservation- CITES, Ramsar Convention, Convention on biological diversity

Unit: 3 Biodiversity uses and ecosystem services (8 hours)

Biodiversity uses and ecosystem services; threats to biodiversity- habitat loss, habitat fragmentation, exotic species and environmental pollution; species extinction; IUCN threat categories- global and national status; Threats to aquatic and marine biodiversity. Endangered and threatened species of India; Biodiversity assessment and monitoring.

Unit: 4 Ex situ Biodiversity conservation (7 hours)

Ex Situ Biodiversity conservation: Species management plans, captive breeding, field gene banks, seed gene banks, cryopreservation, gene banks. National and international efforts for biodiversity conservation- CITES, Ramsar Convention, Convention on biological diversity, IPR and Patent rights.

Reference Books:

1. Biodiversity conservation: 101, by Amelia Chiles, Eleanor J. Sterling, Georgina Cullman, and Melina Laverty.
2. Exploring Agrodiversity -Book by Harold Brookfield.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I Sem. I: Sustainable Agriculture Management, NEP 2020 (2.0)
(Course - II) DSC– Practical B. Voc. Paper- II

Horticulture and Biodiversity Conservation: (Practical)

(Credits: 02)

List of Practical's:

Group - I

1. Identification of Horticultural Crops.
2. Study about garden tools and implements.
3. Orchard planning and layout.
4. Landscaping and Design Principles.
5. Preparation of Nursery Bed/Seed Bed.
6. Study of Pots, Potting and Repotting.
7. Study about System of Planting.
8. Commercial method of propagation of Horticultural crops.
9. Study about training and pruning.

Group – II

1. Habitat Protection.
2. Plant Conservation Techniques and Their Application in Local Biodiversity.
3. Sustainable Resource Use
4. Species Conservation
5. Restoration of Degraded Ecosystems
6. Environmental Education & Awareness
7. . Study about System of Irrigation.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I Sem. I: Sustainable Agriculture Management, NEP 2020 (2.0)

(Course - III) DSC– I B. Voc. Paper- I

Agriculture Economics

Theory: 30 Hours

(Credits: 02)

UNIT- I: Principles of Economics (8 hours)

Production Principles, Production Costs, Supply and Revenue. Principles of Profit Maximization and Loss Minimization. Principles of Consumption and Demand. Price Elasticity Concepts. Principles of Market Price Determination. Competitive vs. Non-Competitive Market Models

UNIT-II: Marketing Food and Agricultural Products (7 hours)

Functional and Institutional Approaches to Marketing. Costs of Marketing Food and Agricultural Products. Operation of the Futures Markets. Agricultural Economics as a Social Science. Structure of Agriculture Sectors

UNIT- III: Agricultural Problems and Policy Analysis. (8 hours)

Goals and Policies and Programs. Price and Income. Resource Use. Land Economics, Locally Grown Foods.

UNIT-IV: Global Issues Population Growth. (7 hours)

World Food Production Trends. Trade in Agricultural Products. The Role of agriculture in economic growth

Reference Books:

1. Cramer, Jensen, and Southgate, Agricultural Economics and Agribusiness, John Wiley.
2. Drummond and Goodwin, Agricultural Economics, Prentice Hall.
3. Economics, Penson, Capps, and Rosson, Introduction to Agricultural Prentice Hall.
4. Seitz, Nelson, Economics of Resources, Agriculture and Food, Halcrow
5. C.B. Singh (Author), R.K. Singh (Author), A Textbook of Agricultural Economics Paperback – 2011
6. Ian A. Goldin (Editor)Economic Reform, Trade and Agricultural Development Paperback – Import, 1 Jan 1993

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I Sem. I: Sustainable Agriculture Management NEP 2020

(2.0) (Course - III) DSC– II B. Voc. Paper- II

Fundamental of Entomology

Theory: 30 Hours

(Credits: 02)

Unit 1: History of Entomology (8 hours)

Classification of phylum Arthropod. Relationship of class Insecta with other classes of Arthropod. Morphology– Grasshopper/ Plant bug, structure and functions of insect cuticle, Moulting. Body segmentation.

Unit 2: Insect and their body parts (7 hours)

Structure of Head, thorax and abdomen. Structure and modifications of insect mouth parts. Types of insect larvae and pupae.

Unit 3: Insect and their Anatomy (8 hours)

Digestive system, Circulation system, Respiration system, Excreta system and Reproductive system of insect etc. their parts and functions.

Unit 4: Insect and their Anatomy (7 hours)

Identification, symptoms of damage caused by pests of Wheat, Coconut, Banana, Brinjal, Bitter gourd and cowpea. Nematode Pests of crops, Common Pests of stored food products/grains. Pest monitoring Pest surveillance and pest forecasting. Assessment of pest population and damage.

Reference Books:

1. Nayar, K.K. Ananthakrishnan T. N. and David.B.V.1976.GeneralandApplied Entomology, Tata Mc Graw Hill Publishing Company Limited, New Delhi, 589.
2. Pedigo, L. P. 1999. Entomology and Pest Management. Third Edition. Prentice Hall, New Jersey, USA.
3. Richards, O.W. and Davies, R. G. 1977.Imm's General Text Book of Entomology, Vol.1&2, Chapman and Hall Publication, London.
4. Srivastava, P. D. and Singh, R. P. 1997.An Introduction to Entomology, Concept Publishing Company, New Delhi.
5. Dhaliwal, G.S. and RameshArora.1998. Principles of Insect Pest Management. Kalyani 14 Publishers, New Delhi.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I Sem. I: Sustainable Agriculture Management, NEP 2020
(2.0) (Course - III) DSC– Practical B. Voc. Paper- III
Agricultural Economics and Agri. Products- marketing:
(Practical) (Credits: 02)

List of Practical's:

Group – I

1. Study of Advertisement & Promotion Strategies
2. Study nature and demand supply
3. Market Survey.
4. Input Marketing.
5. Output Marketing.
6. Consumer Behavior
7. Estimation of price elasticity.
8. Calculation of fertilizer requirement, fertilizer mixtures and unit values.

Group – II

1. Collection and preservation of Insect adult, larvae pupae etc.
2. Preparation of insect collection box.
3. To study insect taxonomy and identification.
4. To study beneficial insect.
5. To study stored grain pests.
6. Integrated pests' management.
7. To Insect collection preservation.
8. Case study of particular insect.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I Sem. I: Sustainable Agriculture Management, NEP 2020

(2.0) OPEN ELECTIVE – I (Theory)

Biofertilizers and Biopesticides

Theory: 30 Hours

(Credits: 02)

Unit:1 Biofertilizers (15 Hours)

Definition and Introduction of Biofertilisers, History of Biofertilisers, Microbes as biofertilisers, Scope and Necessity of Biofertilisers. Types of Biofertilisers, Advantages of Biofertilisers use in Agriculture, Algal biofertilizers, Jeevamrut preparation

Unit:2 Biopesticides (15 Hours)

Definition and Introduction of Biopesticides and Chemical Pesticides, History of Biopesticides, Need of Biopesticides in Agriculture, Scope of Biopesticides. Types of Biopesticidess, Advantages of Biopesticides in Agriculture

Reference Books:

1. Agrochemicals Desk Books By John Montgomery.
2. Agrochemicals, Composition, production, toxicology - Franz Muller

3.Balasubramaniyan, P and Palaniappan, S.P.2001. *Principles and Practices of Agronomy* Agro Bios (India) Ltd., Jodhpur.

4.Cox, G.W and Atkins, M.D. 1979. *Agricultural Ecology: An Analysis of World Food Production Systems.* W.H. Freeman and Company, San Francisco

5.De, G.C. 1989. *Fundamentals of Agronomy*. Oxford & IBH Publishing Co., New Delhi.

6.Grigg, D.B. 1974. *The Agricultural Systems of the World: An Evolutionary Approach*. Cambridge University Press, Cambridge.

7.Harlan, J.R. 1992. *Crops and Man.* American Society of Agroy & Crop Science Society of America, Madison, WI.

8.Reddy.T.Y and Reddy, G.H.S.1995.*Principles of Agronomy*, Kalyani Publishers, Ludhiana.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I Sem. I: Sustainable Agriculture Management, NEP 2020 (2.0)

IKS – I (Theory)

Theory: 30 Hours

(Credits: 02)

SYLLABUS IS SAME FOR ALL B VOC COURSES

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I Sem. II: Sustainable Agriculture Management, NEP 2020 (2.0)
(Course - I) DSC– I B. Voc. Paper- I
Green Technology in Agriculture
Theory: 30 Hours
(Credits: 02)

Unit: 1 Introduction to Greenhouse Technology (8 hours)

Green house technology: Introduction, Types of Green Houses; Plant response to Green house environment, Planning and design of greenhouses, Design criteria of green house for cooling and heating purposes. Green house equipment's, materials of construction for traditional and low cost green houses. Irrigation systems used in greenhouses, typical applications, passive solar green house, hot air green house heating systems, green house drying. Cost estimation and economic analysis

Unit: 2 Green future (7 hours)

Agenda of green development; reduction of ecological footprint; role of green technologies towards a sustainable future; major challenges and their resolution for implementation of green technologies; green practices to conserve natural resources emphasis on waste reduction instead of recycling, emphasis on innovation for green future; role of advancement in science in developing environmental friendly technologies.

Unit: 3 Applications of green technologies (8 hours)

Increase in energy efficiency: Energy efficient fume hoods, motion detection lighting, or programmable thermostats. Green House Gas (GHG) emissions reduction: carbon capture and storage (CCS) technologies, purchase and use of carbon offsets, Pollution reduction and removal: Physico-chemical and biological methods

Unit: 4 Green chemistry (7 hours)

Introduction to green chemistry; principles and recognition of green criteria in chemistry; degradable and bio-accumulative products in environment; green nanotechnology; reagents, reactions and technologies that should be and realistically could be replaced by green alternatives; photodegradable plastic bags. (7 hours)

Reference Books:

4. Baker, S. 2006. Sustainable Development. Routledge Press.

2. Floyd. A., 2011. Green Building: A Professional's Guide to Concepts, Codes and Innovation. Delmar Cengage Learning

3. Hrubovcak, J., Vasavada, U. & Aldy, J. E. 1999. Green technologies for a more sustainable agriculture (No. 33721). United States Department of Agriculture, Economic Research Service.

4. Striebig, B., Ogundipe, A.A. and Papadakis, M., 2015. Engineering applications in sustainable design and development. Cengage Learning.

5. Thangavel, P. & Sridevi, G. 2015. Environmental Sustainability: Role of Green Technologies. Springer Publications.

6. Vallero, D.A. and Brasier, C., 2008. Sustainable Design: The Science of Sustainability and Green Engineering. John Wiley & Sons.

7. Woolley, T. & Kimmins, S. 2002. Green Building Handbook (Volume 1 and 2). Spon Press.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I Sem. II: Sustainable Agriculture Management, NEP 2020 (2.0)
(Course - I) DSC– II B. Voc. Paper II
Techniques in Supporting Agriculture
Theory: 30 Hours
(Credits: 02)

UNIT-I: (8 hours)

Sericulture Introduction, characteristics of silkworm moth, silk worm breeding mulberry cultivation, production of non mulberry silks, Sericulture, development of silk production in India, Central silk board Act,1948.

UNIT-II: (7 hours)

Apiculture Bee keeping-method, life cycle of honey bees, suitable species in Indigenous system, advantages as medicine, by –products, advantage for pollination of crops.

UNIT-III: (8 hours)

Vermicomposting Vermiculture-Introduction, Earthworm life cycle, the microbiology of vermicomposting Verm technology. Advantage of vermiculture, vermicomposting, Earth worms end uses and potential.

UNIT-IV: (7 hours)

Techniques of Mushroom cultivation Introduction morphology of mushrooms, techniques of mushroom cultivation of edible mushrooms, Nutritive value and negative effect of mushrooms, marketing techniques.

Reference Books:

1. BC Suman, The Cultivated Mushroom Chicago Bureau of Mushroom Industry
2. BC Suman& VP Sharma, Mushroom Cultivation in India
3. George N. Agricos, Plant Pathology
4. Butler, Charles, The Feminin Monarchi, or the Histori of Bees,.
5. Gilles Augustin, The Natural History of Bees, Their Production, Bazin
6. White, Rev Stephen, Collateral Bee Boxes or a New Easy and Advantageous Method,
7. Warder, J., The True Amazons or the Monarchy of the Bees, 1765

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I Sem. II: Sustainable Agriculture Management, NEP 2020
(2.0) (Course - I) DSC– Practical B. Voc. Paper III
Green Technology and Techniques in Supporting Agriculture (Practical)
(Credits: 02)

List of Practical's:

Group – I

1. Study of greenhouse equipments.
2. Study of the Production Process of Biodiesel
3. Study of different type of greenhouses based on shape
4. Study of Fixed Drum Biogas Plants
5. Study of Floating Drum Biogas Plants
6. Visit to various Post Harvest Laboratories
7. Determine the rate of air exchange in an active summer winter cooling system.
8. Field visit to seed processing plant

Group - II

1. Mulberry crop production technology .
2. Collection and transportation of silkworm eggs
3. Cocoon Harvesting
4. Wax Extraction and Purification
5. Pollen Collection and Storage
6. Production, Extraction and Storage of Royal Jelly
7. Visit to Honey Processing and Packaging Industry.
8. Visit: Patgaon Honey Gaon.

Reference Books:

1. Chaudhuri, P.S. (2005). Vermiculture and vermicomposting.as biotechnology for conversion of organic wastes into animal protein and organic fertilizer. Asian Jr. of Microbiol. Biotech. Env. Sc., 7(3):359-37A.
2. Chaudhuri, P.S. (2006). Kenchor Jeevan Baichitra: Kencho Projukti. Jyan BichitraPrakashani, Tripura, ISBN: 81-8266-088-2, 128 pages.
3. Das, M.C. QAD. Charles Darrvin's Plough. Tools for Verm technology. I K International Publishing House, ISBN: 978-93-81 141-27, 182 pages.
4. Ismail, S.A. (i997). Vermicology - The Biology of Earthwomans. Orient Longman, 92 pages.
5. Kals, R.D. (1998). Earthworms: Cinderella of organic farming. Prism Books Pvt. Ltd., Bangalore
6. Chattopadhyay G.N. (2012). Use of vermicomposting biotechnology for recycling organic wastes in agriculture. International Journal of Recycling of Organic Waste in Agriculture. Vol-1 (8) pp- 01-08
7. Paul, N., Giri, U & Roy, G. (2019). Comp & Roy, G. (2019). Composting. Intech open, 19 pages DOI: http://dx.doi.org/10.5772/intechopen.88753.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I Sem. II: Sustainable Agriculture Management, NEP 2020 (2.0)
(Course - II) DSC– I B. Voc. Paper I
Nursery Management
Theory: 30 Hours
(Credits: 02)

Unit: 1 Introduction to Nursery Management (8 hours)

Media for propagation of plants in nursery beds, potting and repotting. Preparation of nursery beds and sowing of seeds. Tray cultivation and open farm growing bags, Nursery management of fruit crops and raising of rootstock. Seed treatments for breaking dormancy and inducing vigorous seedling growth. Preparation of plant material for potting.

Unit: 2 Techniques in Nursery (7 hours)

Practicing different types of cuttings, layering, grafting and budding etc. Use of mist chamber in propagation and hardening of plants. Preparation of plant growth regulators for seed germination and vegetative propagation. Digging, labelling and packing of nursery fruit plants. Maintenance of nursery records.

Unit: 3 Nursery Tools (8 hours)

Use of different types of horticultural tools and implements for general nursery and virus tested plant material in the nursery. Cost of establishment of a mist chamber, greenhouse, glasshouse, polyhouse and their maintenance. Nutrient and plant protection applications during nursery

Unit: 4 Government regulations and Policies (7 hours)

Government regulation norms and policies in Horticulture Nursery Management. Marketing planning for nursery products. Plant Library Concepts and Operations Economics. Methods and planning for Proper Nursery according to Government Policy.

Reference Books:

1. Kotler, P., Bowen, J. & Makens, J. – Marketing for Hospitality and Tourism. Pearson, 2016.

2. Middleton, V.T.C. & Clarke, J. – Marketing in Travel and Tourism. Routledge, 2012.
3. Kotler, P. & Keller, K.L. – Marketing Management. Pearson, 2016.
4. Bhatia, A.K. – International Tourism Management. Sterling Publishers, 2011.
5. Morgan, N., Pritchard, A. & Pride, R. – Destination Branding: Creating the Unique Destination Proposition. Elsevier, 2011.
6. Goeldner, C.R. & Ritchie, J.R.B. – Tourism: Principles, Practices, Philosophies. Wiley, 2011.
7. Laws, E., Prideaux, B. & Chon, K. – Tourism Marketing: Service and Strategy. Routledge, 2007.
8. Smith, S.L.J. – Marketing Tourism Destinations. Routledge, 2014.
9. Wood, R.C. & Parsons, R. – Marketing Hospitality and Tourism Services. Cengage Learning, 2007.
10. Kotler, P., Haider, D.H. & Rein, I. – Marketing Places: Attracting Investment, Industry, and Tourism to Cities, States, and Nations. Free Press, 2002.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I Sem. II: Sustainable Agriculture Management, NEP 2020

(2.0) (Course - II) DSC– II B. Voc. Paper- II

Agribusiness Management

Theory: 30 Hours

(Credits: 02)

Unit: 1 Scope and Importance of ABM (8 hours)

Study importance and opportunities in production, finance, sales and land management. Agribusiness relations with the financing, marketing, and management of food production. It industrial career opportunities.

Unit: 2 Farm Business Analysis (7 hours)

Farm business analysis - Farm efficiency measures, farm financial & cash accounts, Net worth statement, systems of book keeping. Controlling –Definition, Elements, Process of control, Techniques/ Tools of control.

Unit: 3 Agrotourism (8 hours)

Agro-Tourism, Introduction, importance, scope, forms of agro-tourism, advantages and implementation, introduction to Indian culture. Requirements for Agro-tourism. farm, forest, garden, wild life, fish tank/ponds, coastal areas. residential huts, etc.

Unit: 4 Rural Development (7 hours)

Rural Development: concept, meaning, definition; various rural development programmed launched by Govt. of India. Meaning, definition, concept & principles, Concept and definition, types of leaders in rural context; extension administration: meaning and concept, principles and functions. Meaning and process of communication, verbal and nonverbal communication

Reference Books:

1. K.Loknandhan, K.Mani, K.Mahendran Innovations in AB
2. D.K. Tripathi Principles& Practices of Management.
3. S.S. Johl, T.R. Kapoor Fundamentals of farm business management
4. V. Gangadhar et al. Entrepreneurship Development. Kalyani Publishers, Ludhiana.
5. J.M. talathi et al. Introduction to Agricultural Economics & Agribusiness Management. Ane Books Pvt. Ltd. New Delhi

6. Ellis, R.S., Educational Psychology. D.N. Van No Strand Co. Inc. New York.
7. Entrepreneurship Development Institute of India (1987), Developing New Entrepreneurs, EDIT, Ahmedabad, NISIET. Library: 338-93/EDI/87/25104.
8. Khanka S.S. (2001), Entrepreneurial Development Chand and company Ltd, 7361, Ramnagar, New Delhi – 110055.
9. Vasant Desai (2004), Dynamics of Entrepreneurial Development and Management.
10. Agarwal R.C. Fundamentals of Entrepreneurship.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I Sem. II: Sustainable Agriculture Management,, NEP 2020
(2.0) (Course - II) DSC– Practical B. Voc. Paper II
Nursery and Agribusiness Management. (Practical)
(Credits: 02)

List of Practical's:

Group - I

1.Study of various business models in agri-business.

2. Study of farm records

3. Study of farm inventory

4. Study of System of book keeping

5. Study of farm accountancy

6. Study of measures of farm income

7. Study of measures of farm efficiency

8. Study of farm planning techniques & situations

9. Study of problems of partial budgeting

Group – II

1. Local market survey.
2. Benefit cost ratio.
3. Supply chain management.
4. Survey of local and exotic products.
5. Supply crop loans.
6. Crop insurance.
7. Agro product marketing.
8. Agro Exhibition.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I Sem. II: Sustainable Agriculture Management,, NEP 2020

(2.0) (Course - III) DSC– I B. Voc. Paper I

Production Management of Agricultural Crops

Theory: 30 Hours

(Credits: 02)

Unit: 1 Introduction of Fruit Crops (8 hours)

Classification of fruit crops on horticultural basis. Importance, present status and future scope for fruit growing in Maharashtra and India. Area and production, export, import scenario of fruit crops and plantation crops in Maharashtra and India. Nutritive value of fruits, importance of selection of site, fencing, planting systems, high density planting, wind breaks and shelter belts in fruit production. Propagation methods and use of rootstocks, methods of training and pruning.

Unit: 2 Production of Fruit Crops (7 hours)

Special horticultural practices like bahar treatment, ringing, girdling, bending, notching, etc. Nutrient management, water management, weed control, mulching, intercropping, use of growth regulators in fruit production, physiological disorders in fruit crops. Package of practices for cultivation of major fruit crops like, mango, banana, citrus, grape, papaya, sapota, guava, pomegranate, minor fruit crops like beri, fig, coconut, areca nut, etc. Industrial value of plantation crops

Unit: 3 Production of Vegetable Crops (8 hours)

Vegetable: Definition, scope and importance of vegetable crops, area, production, distribution, exports and imports of vegetables from Maharashtra Nutritive value, classification of vegetables, type of vegetable farming – kitchen garden, market garden, Cultivation of major vegetables like Tomato, Potato, Chilli, Brinjal, Onion, Cabbage, Cauliflower, Watermelon, Cucumber and minor vegetables like Methi, Coriander, Palak,

Unit: 4 Horticultural Gardening (7 hours)

Horticulture gardening. Principles of garden design (Formal and Informal Garden and Land scaping), Production technology of rose, chrysanthemum, aster, carnation, jasmine, marigold, gladiolus, tuberose, gaillardia, orchids, anthurium, gerbera and dahlia.

Reference Books:

1. Bose, T. K., Som, M. C. and Kabir. Vegetable Crops. Naya Prokash,
2. Calcutta Chaudhari, B. Vegetables. National Book Trust of India.
3. Bose, T. K. and L. P. Yadav. Commercial Flowers. Naya Prokash, Calcutta.
4. Radha, J. H. and A. Mukhopadhyay. Floriculture in India. Allied Publishing Pvt. Ltd., New Delhi.
5. Prasad, S. 2005. Commercial Floriculture. Agrobios (India), Jodhpur.
6. Singh, A. K. 2006. Flower Crops: Cultivation and Management. New India Publishing Agency, NIPA.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I Sem. II: Sustainable Agriculture Management, NEP 2020 (2.0)
(Course - III) DSC– II B. Voc. Paper II
Modern Farming System in Sustainable Agriculture
Theory: 30 Hours
(Credits: 02)

Unit: 1 Modern Farming (8 hours)

Farming systems – Definition, scope, classification and components. Integrated Farming System (IFS), models for irrigated and rain fed situation. Cropping systems – indices for evaluation of cropping systems. Irrigation problems Waste lands and their development. Precision Farming- Importance Scope and Components.

Unit: 2 Organic Farming (7 hours)

Organic farming – Definition, principles and components. Sustainable agriculture - Introduction, definition, goal and current concepts. Factors affecting ecological balance and ameliorative measures Land degradation and conservation of natural resources – low external input agriculture (LEIA) and high external input agriculture (HEIA).

Unit: 3 Post Harvest Technology of Flowers (8 hours)

Importance and present status of post-harvest technology in horticultural crops in India and Maharashtra. Maturity, harvesting and handling in relation to extended shelf-life and storage quality of fruits, vegetables and flowers. Maturity and harvesting indices of fruits, vegetables and flowers. Factors responsible for maturity, ripening and deterioration of horticultural produce., vegetables and flowers

Unit: 4 Post Harvest Technology of Fruits (7 hours)

Methods used for harvesting and post-harvest treatment for delaying ripening. Respiration and transpiration rate during packaging and storage. Methods of pre-cooling, grading, packaging, storage and transport of fruits. Control of post-harvest diseases of important fruits

Reference Books:

1. B.N. and Maiti S. 1984 Cropping systems - Theory and practice. Chatterjee. Oxford and IBH Publishing Co., Calcutta, India.
2. Palaniappan S.P. Cropping systems in tropics – Principles and practices –1985.Willey Eastern Ltd., New Delhi.
3. Panda S.G. Soil management and organic farming. 2006. AGROBIOS, New Delhi.
4. Thapa U. and Tripathi P Organic Farming, 2006. Organic Farming in India, Problems and Prospects
5. K Palanippan S.P. and Anandurai Organic Farming – theory and practice, 1999.Scientific Publishers, Jodhpur.
6. Lampin, N. 1990 Organic Farming. Farming Press Books, Ips witch, U.K..

7. Pantastico, E. R., B. Post Harvest Technology, Handling, Utilization of Tropical and Sub

tropical Fruits and Vegetables. The AVI Publishing Co. West-Post, Connecticut, USA.

8. Salunke, D. K. and Desai, B. B. Post Harvest Biotechnology of Vegetables. II CRC Press,

Boca Raton, Florida.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part- I Sem. II: Sustainable Agriculture Management,
NEP 2020 (2.0)

(Course - III) DSC– Practical B. Voc. Paper- III
Production Management of Agricultural Crops and Modern Farming: (Practical)
(Credits: 02)

List of Practical's:

Group - I

1.Study of garden tools and implements.

2.Study of propagation media, containers, potting mixture, potting, repotting and transplanting. Nursery practices for raising seedlings.

3.Identification of fruit and plantation crops. Plant propagation by seed, cutting, layering, budding and grafting. Practices in planning (layout) and planting systems of fruit crops.

4.Training and pruning, manures and fertilizers application, irrigation methods.

5.Visit to commercial Identification of vegetable and ornamental plants.

6.Planning and layout of kitchen garden.

7.Raising and transplanting of vegetable seeds and seasonal flowers.

8.Training and pruning of roses and pinching and disbudding in chrysanthemum. Planning and layout of gardens and garden designs for public and private areas.

Group - II

1.Preparation of cropping scheme for irrigated situations.

2.Preparation of cropping scheme for dryads' situations.

3.Study of existing farming systems in nearby villages;

4.Preparation of integrated farming system model for wetlands;

5.Preparation of integrated farming system model for dry lands;

6. Preparation of enriched Farm Yard Manure;

7.Preparation of Vermicompost

Reference Books:

1. Kader, A. A. Post Harvest Technology of Horticultural Crops. Publication Co. 3311, University of California, Division of Agricultural and Natural Resources, California.

2. Varma, L. R. and V. K. Joshi. Post Harvest Technology of Fruits and Vegetables, Vol.

II. Indus Publishing Company, New Delhi-110 027.

3. Shrivastava, R.D and Kumar Sanjeev. Fruits and Vegetables (Principle and Practices). 3rd Edition.

4. Saraswathy. S, T.L. Preethi, S. Natarajan. Post Harvest Management of Horticultural Crops. AGROBIOS (INDIA).

5. Chadda .K.L. Handbook of Horticulture. ICAR.

6. Jature, S. J,S.J Shinde and V.S. Khandare. A Text Book of Post Harvest Management &Value addition of Fruits and Vegetables Shri. Rajlakshmi Prakashan. Aurangabad.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I Sem. II: Tourism and Service Industry, NEP 2020 (2.0) OE:
OPEN ELECTIVE – II (Theory)
Food Preservation
Theory: 30 Hours
(Credits: 02)

Unit:1 Fundamentals of Food Preservation (15 Hours)

Concept; Importance of food preservation; Principles of food preservation; Techniques of food preservation. Introduction; Types of Microorganisms; Conditions for growth; Food spoilage & their control. Classification of nutrients

Unit:2 Preservation Techniques (15 Hours)

Concept and definition, Types, Natural preservatives, Synthetic preservatives. Concept, definition, Principles of irradiation, Types, Application. Modern Techniques in food preservation

Reference Book:

1.Prakash Triveni: Food Preservation, Aadi publication, Delhi.
2. M. Shafiur Rahman: Hard Book of Food Preservation, Marcel Dekker Inc, New York.
3. Mc Willims and Paine: Modern Food Preservation, Surjeet Publication.
4. Fellows, P and Ellis H. 1990 Food Processing Technology: Principal and Practicals, New York.
5. NPCS Board, Modern Technology on Food Preservation 6) B. Sivasankar; Food Processing and Preservation
6.Khetarpaul N (2005) Food Processing and Preservation. Dayabooks.
7.Rahman M S (2007) Handbook of Food Preservation 2nd ed CRC Press.
8.Nagi M and Bajaj S (1982) Home Preservation of fruits and Vegetables. Centre for Communication and International Linkages, PAU, Ludhiana.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part- I Sem. II: Sustainable Agriculture Management, NEP 2020 (2.0)

VEC

Democracy, Election and Constitution

(Credits: 02)

Compulsory to all B. Voc. Courses.

Course Outcome:

1. Understanding scientific principles of crop and livestock production, acquiring practical skills in farming and farm management.
2. Developing critical thinking and analytical abilities to solve agricultural problems, gaining knowledge of agribusiness and economics.
3. Understanding the role of agriculture in national economies and sustainability, and honing communication, teamwork, and ethical professional behavior.
4. Students will know the different agribusiness opportunities and will get necessary managerial skills.
5. Students will raise the nurseries of different vegetables crops for commercial Sale.
6. Students will produce biocontrol agents like Trichoderma, Pseudomonas and bio fertilisers like phosphobacteria for commercial marketing

Program Outcome:

1. To impart firsthand knowledge on agriculture and allied sciences.
2. To impart in-depth practical knowledge in agriculture and allied sciences.
3. To provide extensive knowledge on Agri-allied sectors like livestock, Poultry.
4. To disseminate different technologies through various extension activities.
5. To identify and overcome the problems encountered in day-to-day agriculture.
6. To provide knowledge on commercial agricultural production practices.
7. To make students competitive in pursuing higher studies.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part- I (Sustainable Agriculture Management) NEP 2020 (2.0)

Semester – I & II: Theory

Nature of a Question Paper

Time: 1:00 Hrs. **Total Marks: 30**

Solve questions from the following.

Q. 1 Multiple choice Question **06 Marks**

i.

ii.

iii.

iv.

v.

vi.

Q. 2 Attempt any <u>two</u> of the following **12 Marks**

i.

ii.

iii.

Q. 3 Attempt any <u>four</u> of the following **12 Marks**

i.

ii.

iii.

iv.

v.

vi.

Internal Assessment **20 Marks**

1. Home Assignment
2. Class Assignment (Tutorial Type)
3. Quiz
4. Mid-Term Test

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part- I (Sustainable Agriculture Management) NEP 2020 (2.0)

Semester – I & II: Practical

Nature of Practical Question Paper

Internal practical examination	**50 marks**
1. Group- I	20 Marks
2. Group- II	20 Marks
3. Submission of Certified Journal	10 Marks

Assessment:

The NEP 2020 emphasizes upon formative and continuous assessment rather than summative assessment. Therefore, the scheme of assessment should have components of these two types of assessments. Assessment has to have correlations with the learning outcomes that are to be achieved by a student after completion of the course

a) **Continuous Assessment:** Assignments, projects, presentations, seminars and quizzes
b) **Examinations:** Midterm, finals, or comprehensive exams.
c) **Research Projects/Dissertation/Thesis:** Evaluated through submission and viva-voce
d) **Grading System:** Standardized letter grades, percentages, or CGPA

Letter Grades and Grade Points:

The Semester Grade Point Average (SGPA) is computed from the grades as a measure of the student's performance in a given semester. The SGPA is based on the grades of the current term, while the Cumulative GPA (CGPA) is based on the grades in all courses taken after joining the programme of study. The HEIs may also mention marks obtained in each course and a weighted average of marks based on marks obtained in all the semesters taken together for the benefit of students.

Computation of SGPA and CGPA: UGC recommends the following procedure to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA)

Letter Grade	Grade Point
O (Outstanding)	10
A+ (Excellent)	9
A (Very Good)	8
B+ (Good)	7
B (Above Average)	6
C (Average)	5
P (Pass)	4
F (Fail)	0
Ab (Absent)	0

1. The SGPA is the ratio of the sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e.

$$\textbf{SGPA } (S_i) = \frac{\sum (C_{ix} G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i^{th} course and G_i is the grade point scored by the student in the i^{th} course.

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