OFFICE OF THE REGISTRAR:: DIBRUGARH UNIVERSITY:DIBRUGARH

The Syllabuses of the

Skill Based Courses for B.Sc. (General) Programme in the Semester System

Reference: D.U. Notification vide Memo No.: DU/DR-A/8-1/13/303 dated 02.07.2013*

Important:

a. ***The Colleges are requested to offer these Courses as Skill Enhancement Courses of the BA/ B.Sc./ B.Com Programmes in CBCS, which will be converted to the Credit System (2 Credit Course) with minor modifications in contents.***

b. ***The conduct of these Courses may remain same to the earlier Non-CBCS mode notified vide Memo No.: DU/DR-A/8-1/13/303 Date: 02.07.2013 (attached herewith).***

(1)

Subject: Photopshop

Subject Code: PTSG

Course Structure

Course Code	Title	Type	Marks		
			I.A.	End Sem.	Total
PTSG-1	Photoshop	Theory	20	80	100
PTSG-2	Practical on Photoshop	Practical	20	80	100

Course Title: Basics of Photoshop

Course Code: PTSG-501 (5th Semester)

Total Marks: 100 (20 for Internal Assessment & 80 for End Semester Examination)

Unit 1. Introduction **10 Marks, 7 Classes**

The Photoshop Interface, setting up a new Photoshop document, Saving a new document, The Default Palettes, Working with Photoshop Palettes, The Photoshop Toolbox and Options bar, Using Guides and Ruler, Supported import in export image formats, Opening an Image in Photoshop, Creating Images in Photoshop, Saving Images in Photoshop, Basic Image Editing, Changing Image Size, Cropping an Image, Changing Color/Bit Depth, Optimizing Images using Save for Web, Working with Color in Photoshop.

Unit 2. Photoshop Tools and Transforms **20 Marks, 12 Classes**

Parts of the Toolbox, Toolbox Shortcuts, Tools Options, Marquees, Magic wand Lassos, Move tool, Crop tool, Slice tools, Pencil, Paintbrush, Eraser tools, History brushes, Clone tamp-Pattern stamp, Healing brush tool, Retouch tool, Gradient, Paint bucket, Burn- Dodge-Sponge, Blur-Sharpen-Smudge, Shapes-Line rectangle- polygon-custom shapes, Path, selection tool, Pen tool, Type tools, Notes tool-Audio annotation, eyedropper-Color sampler-Measure tool, Hand-Zoom, Quick mask-Screen modes, Jump to Image Ready, Back ground and Foreground.

Using Free transform, Move, Rotate, Scale, Skew, Distort, Perspective, Flip-vertical, horizontal, Invert Rotate 180^0, Rotate 90^0 CW, Rotate 90^0 CCW

Unit 3, Photoshop Layers and Channels **15 Marks, 10 Classes**

About Layers-Fill and adjustment layers, The Layer Palette, Naming Layers, Creating Layers, Deleting Layers, Viewing Layers, Moving Layers, Layer Opacity, Locking Layers, Merging Layers, Layer modes and blending options, Image composting using layers.

About channels, Channel palette, Creating and viewing Channels, Modifying channels, Deleting channels, Alpha channels and masks.

Unit 4 Photo enhancement and Color correction **15 Marks, 10 Classes**

Changing Levels, Changing Curves, Color balance, Changing Brightness and Contrast, Changing Hue Saturation and Brightness, Changing a grayscale image to a colored image. Histogram, Gradient map, Desatuarate, Invert, Color replace, Selective color, Equalize, Threshold, Channel mixer, Posterize, Changing background using layer composting

Unit 5 Text editing in Photoshop **20 Marks, 12 Classes**

About the type layer, Creating vertical and horizontal types, Point and paragraph text creation, using horizontal and vertical type mask tools, Using Character palette for text editing, Choosing a font, Changing the type color, Choosing a type size, specifying kerning and tracking, Using fractional character widths, specifying baseline shift, applying underline and strikethrough, Text alignment and justification, Specifying anti-aliasing, Creating text warp, Rasterizing type, Converting type to shapes, Adding effects to text

Recommended Books:

1. Adobe Photoshop Bible, Dayley and Dayley, Wiley India Publication.
2. Photoshop in Easy Steps 1st Edition (Paperback), Robert Shufflebotham, Tata Mc Graw-Hill Publication.
3. Adobe Photoshop-Classroom in a Book 1st Edition, Adobe Creative Team, Pearson Publication.

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Course Title: Practical on Photoshop

Course Code: PTSG-601 (6th Semester)

Total Marks: 100 (20 for Internal Assessment & 80 for End Semester Examination)

1. Photoshop Tools and Transforms (20 Marks)

2. Photoshop Layers and Channels (20 Marks)

3. Photo enhancement and Color correction (20 Marks)

4. Text editing in Photoshop (20 Marks**)**

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(2)

Subject: Web Design

Subject Code: WBDG

Course Structure

Course Code	Title	Type	Marks		
			I.A.	End Sem.	Total
WBDG-501	Basics of Web Design	Theory	20	80	100
WBDG-601	Practical on Web Design	Practical	20	80	100

Course Title: Basics of Web Design

Course Code: WBDG-501 (5th Semester)

Total Marks: 100 (20 for Internal Assessment & 80 for End Semester Examination)

Unit I: **Introduction to Computer Network and Internet** **10 Marks, 7 Classes**
Computer Network Basics- LAN, WAN, Topologies, IP Address, Domain Name, Protocol, TCP/IP Basics, HTTP, FTP,SMTP, Concept of Client/Server model
Internet Basics- concept of Internet, Connectivity types, ISP, E-mail, WWW Website and Webpage, Hyperlink, Web Browser, Web Sever, URL, Types of Websites (Static/Dynamic), Search Engines Webpage, Hyperlink, Web Browser, Web Server, URL, Types of Websites (Static/Dynamic), Search Engines

Unit II: **Fundamentals of Web Designing** **10 Marks, 5 Classes**
Planning a website- content, Graphics, Structuring and Navigation, Advertisements/ popups
Design Principles and Issues- Usability, Loading time, color Schemes, Font choices, Image choices, Browser Compatibility, Designing Website in Vernacular languages using Unicode Based software/fonts

Unit III: **Web Designing Tools and Technologies** **5 Marks, 5 Classes**
Introduction of various Web Tools- Frontpage, Dreamweaver, Photoshop, Flash
Concept of Client Side Scripting and Server Side Scripting
Introduction to various Web Technologies- HTML, PHP, Javascript, NET, JSP

Unit IV: **Hypertext Markup Language (HTML)** **40 Marks, 20 Classes**
What is Markup Language, Basic Structure of HTML,
Head Section and Elements of Head Section- Meta Tags, External Link Tags
HTML Structure Tags- Table Tag, Div Tag, Frames
Content/Media Tags- Header Tags, Paragraph, Span, Pre Tags, anchor Links and Named Anchors, Image Tags/Image Hot Spots, Object Tag, I Frame Tags
Working with Forms- Form Tag, POST and GET Method, Text Input, Text Area, Checkbox, Image Input and Radio, Select Option, Option Group, File Upload and Hidden Fields, Submit Button, Reset Button

HTML 5: Introduction to HTML5, What is new in HTML5, Features of HTML5 Doc type, New Structure Tags- Filed Validation, Placeholder, Email, tel,url, number, date range
New Media Tags- Audio Tag, Video Tag.

Unit V: Cascading Style Sheet (CSS) 15 Marks, 10 Classes
Introduction to CSS, Internal and External Style sheets, Inline styles, CSS syntax, ID and Class Selectors, Applying styles to Elements such asa texts, links lists, images, tables and backgrounds CSS Box Model, Border, Outline, Margin and Padding

Recommended Books:

1. Murach's HTMLS and CSS3, Zak Ruvalcaba, Murach's SPD Pub.
2. Internet technology and Web Design, ISRD group, Tata Mc Graw-Hill

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Course Title: Practical on Web Design

Course Code: WBDG-601 (6th Semester)

Total Marks: 100 (20 for Internal Assessment & 80 for End Semester Examination)

1. Fundamentals of Web Designing

2. Web Designing Tools and Technologies

3. Hypertext Markup Language (HTML)

4. Cascading Style Sheet (CSS)

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(3)

Subject: Repairing and Maintenance of Electronic Appliances

Subject Code: RMEG

Course Structure

Course Code	Title	Type	Marks		
			I.A.	End Sem.	Total
RMEG-501	Basics of Electronics & Electronic Devices	Theory	12	48	60
RMEG-502	Practical & Project on Electronics & Electronic Devices	Practical	06	24	30
		Project			10
RMEG-601	Repairing of Television & Computers	Theory	12	48	60
RMEG-602	Practical & Project on Repairing of Television & Computers	Practical	06	24	30
		Project			10
Total Marks			200		

Course Title: Basics of Electronics & Electronic Devices

Course Code: RMEG-501 (5th Semester)

Full Marks: 60 (12 for Internal Assessment & 48 for End Semester Examination)

UNIT-I (Marks-12)

Electrical and electronics materials and components, conductors, insulators, semi conductors, resistors, capacitors and inductors, specification and uses.

Definition of circuits, series circuits, parallel circuits, series and parallel circuits, combination of circuit, Ohm's Law.

UNIT-II (Marks-12)

Transformers and Power supply: Different type of transformers, Basic rectifier circuits, Half wave, full wave and bridge rectifiers, principle of operations, filter circuits, their uses and applications, Zener diode as regulators.
Description of different type of power supply, power supply used in TV and computers, switch mode power supply (SMPS), Principle of SMPS, types, block diagram of SMPS

UNIT-III (Marks-08)

Semi conductors: P-type and N-type semi conductors, formation of P-N junction and its properties, specifications and uses, formation of P-N-P transistor. Different types of terminal characteristics, field effect transistor (FET), silicon controlled rectifier (SCR), photo diodes, light emitting diode(LED), characteristics. Amplification principle of IC, study of common ICs used in Radio and TV receiver circuits.

UNIT-IV (Marks-04)

Multi meters- Its descriptions specifications, ranges, using techniques, measuring voltage, current, and resistance by using Digital and analog multi meter

UNIT-V (Marks-12)

Radio receivers: Block diagram presentation of Radio and working principles.

Modulators: Purpose of modulators and their types (AM & FM)
Amplitude Modulation : Different types of amplitude modulation.
Frequency modulation : Principle of frequency modulation.
Antenna: Different types of radio receiving antenna.
AM Radio receivers: Tunners, RF amplifies, IF amplifiers, detectors, AVC and Audio pre-amplifier and output amplifiers.
FM Radio receivers: Identification and study of different stages.

Reference Books:

1. *Basic Electronics. - S.K. Gupta.*
2. *Elementary Radio Transistor with Tape Recorder and Video. – Ralhan and Gupta.*
3. *Basic Radio and Television (Colour and B/W) - S.P. Sharma.*

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Course Title: Practical & Project on Electronics & Electronic Devices

Course Code: RMEG-502 (5th Semester)

Full Marks: 40 (30 Marks Practical & 10 Marks for Project)

A. Practical

30 Marks (06 Marks for Internal Assessment and 24 Marks for End Semester Examination)

1) Basic drawing techniques- Block diagram, layout diagram including Series Camp Circuit.
2) Identification of components and devices, study of colour code of resistances, condensers, verification of Ohm's Law.
3) Testing of transformers.
4) i) Study of half wave rectifier with and without filter circuit.
   ii) Study of full wave rectifier with and without filter circuit.
   iii) Study of bridge rectifier with and without filter circuit.

5) Testing of semiconductors, diodes and transistor with the help of multi meter, measurement of voltage with the help of multi meter.

6) Study of modern super-heterodyne radio receiver circuits.

7) Study of Radio receivers- Identification of parts and sections alignments.

8) Fixing of dial cord, fixing of volume control, and soldering practice for simple circuit.

9) Assembling of AM / FM radio receiver and faults finding.

B. Project work: 10 Marks

Reference Books:
1. Project Book – 51 Projects. - S.K. Gupta.

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Course Title: Repairing of Television & Computers

Course Code: RMEG-601 (6th Semester)

Full Marks: 60 (20 for Internal Assessment & 48 for End Semester Examination)

UNIT-I (Marks: 04)
Introduction to Television Principle and Theory - Principle of conversion of picture to electrical signal, picture frame, scanning, scanning lines, field and frame frequency, interlace scanning.
UNIT-II (Marks: 16)

B/W TV receivers: description of B/W TV receiver in block diagram form . Principle of TV signal reception by antenna, receiving antenna, balloon booster, tunners
Receiver circuits: Functional description of IF amplifiers, video detector, video amplifiers, sound trap, audio power amplifier, loud speaker.

Deflection circuits: Description of picture tubes, magnetic deflection yoke, system brightness, contrast, height and width control circuits, different type of picture tubes.
Fault finding and rectification of B/W TV receivers trouble shooting..

UNIT-III (Marks: 16)
Colour TV receivers- Primary colours, mixing of colours, saturation, luminance, luminance signal colour, different signals.

Colour picture tube- Different types of tubes, PIL, Trinitron, purity and convergence, degaussing. Chroma section of Colour TV, colour signal matrix, RGB matrix. Fault

finding and rectification of colour TV receivers trouble shooting. The Main working functions of LCD TV. Concepts of Dish TV, Magic box etc.

UNIT-IV (Marks:12)

Computer Software: Different type of computer software, formatting and installation of software

Computer hardware identification: RAM, CPU, ROM, hard disc, SMPS and ICs. Computer Monitor's working function, Testing procedures.

Reference Books:

1. *Introduction to Colour Television.* - *Electronics Hobbyist Editor.*
2. *Repidex Television Technician's Course.* - *A.K. Maini.*
3. *Practical Television Servicing.* - *N.K. Dewan.*

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Course Title: Practical & Project on Repairing of Television & Computers

Course Code: RMEG-602 (5th Semester)

Full Marks: 40 (30 Marks Practical & 10 Marks for Project)

A. Practical

30 Marks (06 Marks for Internal Assessment and 24 Marks for End Semester Examination)

1) Identification and study from different sections of TV receivers circuit diagram. (B/W & Colour)
2) Study of composite video signal, EHT stage, deflection circuit and fault arising due to degaussing section. 05
3) Alignment of TV controls-
    a) Swept sections.
    b) Picture tube controls.
    c) Sound sections controls.
    d) RF and VIF stage controls.
    e) Colour control.
    f) Focus and screen controls.
    g) Electronics Touch Controls.
4) Identification of faults and rectification in various stages of TV receivers (B/W and Colour).
5) LCD TV alignment system and their fault findings with testing procedure
6) Fault finding and testing of power supplies.
7) Alignment of Dish TV with Fault Findings.
8) Identification and study of computer hardware

A. Project work: 10 Marks

Reference Books:

1. Project Book - Electronics Science Experiments. - A.K. Roy.

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(4)

Subject: Floriculture

Subject Code: FLCG

Course Structure

Course Code	Title	Type	Marks		
			I.A.	End Sem.	Total
FLCG-501 (5th Semester)	Basics of Floriculture	Theory	20	80	100
FLCG-601 (6th Semester)	Harvesting, Post Harvesting and Commercial Floriculture	Theory	10	40	50
FLCG-602 (6th Semester)	Practical and Project on Floriculture	Practical	07	28	35
		Project	--	15	15
Total					200

Course Title: Basics of Floriculture

Course Code: FLCG-501(5th Semester)

Total Marks: 100 (20 for Internal Assessment & 80 for End Semester Examination)

Unit I: Origin of floriculture, definition, history, principles, scope and significance; nomenclature and identification of floricultural plants

Unit II: Methods of propagation: seeds and vegetative (cutting, layering and grafting), propagation by specialized stem and roots – bulbs, corms, tubers, rhizomes and bulbils

Unit III: Micro and macro nutrients, common media for propagation- soil, sand, peat, sphagnum moss, vermiculite, soil moisture and nursery beds, Manure: organic and inorganic; irrigation and water management

Unit IV: Gardening and pest management: types of garden- indoor garden, kitchen garden and public garden, concept of green house, its structure and utility in floriculture; identification of major insect pests and diseases of floricultural crops and their control by chemicals and bio-control agents

Unit V: Cultivation, harvesting and storage of flowers (e.g. Rose, Lilium, Anthurium etc.); Cut flowers, its arrangement, vase life and concept of Bonsai.

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Course Title: Harvesting, Post Harvesting and Commercial Floriculture

Course Code: FLCG-601(6th Semester)

Total Marks: 50 (10 for Internal Assessment & 40 for End Semester Examination)

Unit I: Harvesting and post harvest handling- crop loading, maturity indices, harvesting methods, grading and sorting, preservation and packing methods for different flowers, quarantine and regulatory measures

Unit II: Role of *in vitro* culture for propagation of floriculture crops and knowledge of its basic techniques.

Unit III: Commercial floriculture- cultivation practices of common floricultural crops – Gladioli, rose, Canna, Marigold, Dahlia, Tube rose, Chrysanthemum.

Unit IV: Post harvest technology- transportation and marketing, commercialization of the products; propagation, storage and transport of seeds and buds

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Course Title: Practical & Project on Floriculture

Course Code: FLCG-602(6th Semester)

Total Marks: 50 (35 for Practical & 15 for Project)

Part A: Practical
Marks: 35 (07 for Internal Assessment & 28 for End Semester Examination)

1. Preparation of nursery and flowering beds
2. Propagation and cultural practices of Chrysanthemum, gladioli, rose, marigold, canna and seasonal annuals and bulbs
3. Culturural practices of cut flower crops
4. Field trip to nursery, propagation centres and collection of wild flowering plants for herbarium preparation
5. Raising of seedlings and pot plants and their submission
6. Identification of important plants having floricultural significance

Part B: Project
Marks: 15

1. Students are expected to do field study @ one/week and the observations may be recorded in the field note. Each student shall submit a minimum of 15 properly identified herbarium specimens in the standard format (cultivars should be avoided) Students are also expected to visit at least one research station and be submitted a duly certified study tour report along with herbarium sheets and field notes for evaluation.

2. Students may be asked to prepare a proposal seeking financial assistance from a bank for establishing a well equipped nursery of floricultural significance.

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Books recommended for Floriculture:

1. Gardening in India - Bose T. K. and Mukherjee
2. Text-Book of Horticulture - Rao K. M.
3. Floriculture in India - Randhawa, G.S. & Mukhopadhay.
4. Des Raj (2002). Floriculture and Landscaping. 1st Edition, Kalyani Publishers, Ludhiana, India.
5. Complete Gardening in India – 2009- Gopalaswami lyenger ICAR, New Delhi.
6. Introduction to Ornament Horticulture by Dr. J.S. Arora.
7. Flowers and Trees- 2008- M.S. Randhawa - National Book Trust – New Delhi.
8. Hartmann, H.D., Kester, D.E., Davies Jr. F.T., and Geneve, R.L., (1997). Plant Propagation. Principles and Practices. Prentice-Hall India Pvt. Ltd. New Delhi.

Basic requirements for conducting the Skill Based Course on Floriculture:

a. Tools & Equipments:

1. Kassi / Spade
2. Khurpi.
3. Hand hoe
4. Saw
5. Watering Can.
6. Rose Can.
7. Grass Cutter.
8. Budding & Grafting Knives
9. Secateur
10. Forceps
11. Buckets
12. Edge Cutter
13. Tree Pruner

b. Farm Structures

1. Small plot of land for nursery
2. Green House 01 no.(Small)
3. Poly House 01 no.(Small)
4. Farm Equipment
5. Hand Sprayer (Small)..
6. Hand Gloves
7. Balance 01 no.
8. Sieve / Stainer 02 nos.
9. Grass Mower 01 no.

c. Laboratory Equipment

1. Refrigerator 01 no.
2. Glass Wares Beakers 05 nos.
3. Measuring Cylinder 05 nos.
4. **Chemicals**
5. Growth regulators :
6. Accessories for flower arrangement
7. Different types of flower containers as required
8. Flower vases as required
9. Pin holder as required etc.

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(5)

Subject: Sericulture

Subject Code: SRCG

Course Structure

Course Code	Title	Type	Marks		
			I.A.	End	Total
SRCG-501	Introduction to Sericulture and pre harvest technology.	Theory	20	80	100
SRCG-601	Post Harvest Technology and Entrepreneurship in Sericulture.	Theory	10	40	50
SRCGP-602	Practical based on theory	Practical	7	28	35
		Project	15		15

Course Code: SRCG-501 (5th Semester)

Subject: Introduction to Sericulture and Pre Harvest Technology

Total Marks: 100 (20 for Internal Assessment & 80 for End Semester Examination)

Unit 1: **Marks 10, Lecture hrs: 5**

a) Meaning, aspects and scopes of Sericulture.

b) Origin of Sericulture, Sericultural practices- India and abroad.

c) Sericulture map of Assam, India and World.

Unit 2: **Marks 45, Lecture hrs: 15**

a) Cultivation practices of Mulberry and non-mulberry host plants in India.

b) Methods of propagation of host plants: seeds and vegetative (cutting, layering and grafting)

c) Soil preparation: Micro and macro nutrients, Manure: organic and inorganic; moisture content, irrigation and water management.

d) Diseases of host plant of Silkworm: Types, pathogen, symptoms and management.

e) Pests of host plant of Silkworm: Classification, mode of infestation, symptoms, biology and Management.

f) Establishment of sericulture garden: Raising & Maintenance of Nursery & Garden, Mechanisation of sericulture farming

Unit 3: Marks 45, Lecture hrs: 25

a. Silkworm species, biology of silkworms, silk synthesis, silk chemistry.
b. Silkworm Diseases: Types, symptoms, mode of entry of pathogen and management.
c. Silkworm Pests: Classification, symptoms, biology and Management.
d. Pre-requisites for Rearing: Preparation and maintenance of Silkworm Rearing House, disinfection.
e. Rearing technology of mulberry and non-mulberry silkworm: Seed preparation, Incubation, Chawki Rearing, Late Age Rearing.

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Course Code: SRCG-601 (6th Semester)

Subject: Post Harvest Technology and Entrepreneurship in Sericulture.

Total Marks: 50 (10 for Internal Assessment & 40 for End Semester Examination)

Unit 1: Marks 25, Lecture hrs: 12

a. Post harvest technology: Cocoon quality, classification, price fixing, Cocoon processing, Silk bave.
b. Reeling operation: Reeling, rereeling, spinning, silk examination, byproducts of reeling, silk fabrics, equipments.

Unit 2: Marks 25, Lecture hrs: 12

a) Employment & Entrepreneurship in sericulture, - Pre-cocoon Sector, Silkworm Seed Production, By-Product Utilization, Post-cocoon Sector women in sericulture, Sericulture & Rural Economy, Funding agencies, preparation of viable project for establishment of sericulture.
b) Sericulture organization in India and Assam; role of state departments of Sericulture, Central Silk Board, Universities and NGOs in Sericulture.

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Course Code: SRCG-602 (6th Semester)

Subject: Practical.

Marks: 50= 7 (IA) + 28 (End) + Project = 15

Experiment 1: Soil Sampling

Experiment 2: Raising of Nursery, Planting Systems

Experiment 3: Preparation of Cuttings and Grafting

Experiment 4: Raising of Seedlings

Experiment 5: Fertilizer Application, Composting and Vermi-composting through Recycling of Sericultural Farm Residue

Experiment 6: Identification of Diseases of Host plants - Foliar, Root Diseases

Experiment 7: Preparation of Spray Solution of Fungicide, insecticide, disinfectant and Application

Experiment 8: Survey and Scoring of Host plant Diseases – Case Study.

Experiment 9: Preparation and maintenance of Silkworm Rearing House

Experiment 10: Incubation and Silkworm Rearing/ Egg Handling/ Chawki Rearing/ Late Age Rearing/ Non-mulberry Silkworm Rearing

Experiment 11: Estimation of Moisture Content of Host plant Leaves.

Experiment 12: Identification of Silkworm species.

Experiment 13: Identification of Silkworm diseases, method of their disposal.

Experiment 14: Identification of Silkworm pest.

Experiment 15: Identification of defective cocoon. Estimation of Defective Cocoon Percentage from the given Sample of Cocoon.

Experiment 16: Visit to sericulture Farms (Compulsory).

Project: **Marks= 15**

Projects will be prepared on the following broad areas and evaluated on the basis of quality of the work and presentation.

1. Biological problem
2. Cultivation practices

3. For grant of financial assistance for entrepreneurship development.
4. Farm management

Books recommended:

1. FAO Agricultural service Bulletin.
2. Muga silk Industry, by S. Choudhury. Directorate of Sericulture, Assam.
3. Eri silk Industry, by S. Choudhury, Directorate of Sericulture, Assam.
4. Mulberry silk Industry. Directorate of Sericulture, Assam.
5. Applied Entomology, by G. Fenemore and Alka Prakash. New Age International (P) Limited, publishers.
6. Principles of Insect pest management, by G.S.Dhaliwal and Ramesh Arora. Kalyani Publishers.
7. The silkworm biology, genetics and breeding, by Dilip De Sarker. Vikash Pblishing House PVT. LTD.
8. Economic Zoology, by Shukla and Upadhaya. Rastogi publications.
9. Report on the diseases of Silkworms in India, by A. Pringle Jamson. International Books & Periodicals Supply Service.
10. Sericulture and Pest Management. Sathe, A. Jadhav, T.V. Sathe, T V & A D Jadhav. Daya Books.
11. Handbook on Pest and Disease Control of Mulberry and Silkworm. Pradip Kumar, Murthuza Baig, K. Sengupta, Govindaiah, UN. ESCAP.

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(6)

Subject: VERMICONPOSTING

Subject Code: VMCG

Course Structure

Course Code	Title	Type	Marks		
			I.A.	End Sem.	Total
VMCG-501	Basics of Vermicomposting	Theory	20	80	100
VMCG-601	Vermicompost Technology	Theory	10	40	50
VMCG-602	Laboratory Course on Vermicompost	Practical	07	28	50
		Project		15	
Total					200

Course Title: Basics of Vermicompost

Course Code: VMCG-501 (5th Semester)

Total Marks: 100 (20 for Internal Assessment & 80 for End Semester Examination)

Part A: Vermicompost **Marks : 50=40 + 10 IA**

Unit I:

Introduction to vermiculture. definition, meaning, history, economic important, their value in maintenance of soil structure, role as four r's of recycling reduce, reuse, recycle, restore.

Unit II:

Role of earthworm in bio-transformation of the residues generated by human activity and production of organic fertilizers. How does nature works.

Unit III:

The matter and humus cycle (product, qualities). Ground population, transformation process in organic matter.

Unit IV:

The species of earthworms; local species of earthworms, choosing the right and useful earthworm. Complementary activities of auto-evaluation.

Part B: Earthworm Biology and Rearing **Marks:50= 40 + 10IA**

Unit V:

Biology of *Eisenia fetida*.:a) taxonomy anatomy, physiology and reproduction of Lumbricidae.
b) Vital cycle of *Eisenia fetida*: alimentation, fecundity, annual reproducer potential and limiting factors (gases, diet, humidity, temperature, P^H, light, and climatic factors). Complementary activities of auto evaluation.

Unit VI:

Biology of *Eudrilus eugeniae*:
a) taxonomy anatomy, physiology and reproduction of Eudrilidae.
b) Vital cycle of *Eudrilus eugeniae*: alimentation, fecundity, annual reproducer potential and limiting factors (gases, diet, humidity, temperature, P^H, light, and climatic factors). Complementary activities of auto evaluation.

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Course Title: Vermicompost Technology

Course Code: VMCG-601 (6th Semester)

Total Marks: 50 (10 for Internal Assessment & 40 for End Semester Examination)

Unit I:
Small scale earthworm farming for home gardens - earthworm compost for home gardens

Unit II:
Conventional commercial composting- Earthworm composting in larger scale

Unit III:
Earthworm farming (vermiculture), extraction (harvest), vermicomposting harvest and processing.

Unit IV:
Nutritional composition of vermicompost for plants, comparison with other fertilizers

Unit V:
Vermiwash collection, composition &use

Unit VI:
Enemies and sickness of earthworms, frequent problems of earthworms, identification of problems and their remedies. Complementary activities of auto evaluation.

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Course Title: Laboratory Course on Vermicompost

Course Code: VMCG-602 (6th Semester)

Total Marks: 50 (35 marks for Practical & 15 marks for Project Work)

Part A: Practical

1. Key to identify different types of earthworms
2. Study of sytematic position, habits and habitat, external characters of *Eisenia fetida*
3. Study of vermiculture, vermiwash & vermicompost equipments, devices
4. Preparation of vermibeds, maintenance of vermicompost & climatic conditions.
5. Harvesting, packaging, transport and storage of Vermicompost and separation

Part B: Project Work **Marks: 15**

(Any one of the following areas)*

1. Field trip- collection of native earthworms & their identification
2. Study of life stages & development of *Eisenia fetida*
3. Study of life stages & development of *Eudrilus eugeniae*
4. Comparison of morphology & life stages of *Eisenia fetida* & *Eudrilus eugeniae*

* Students may take any other project relevant to the subject apart from the above in consultation with the teachers.

Books recommended:

1. Verms &Vermitechnology by Arvind Kumar, A.P.H.Pub., new Delhi-110002.
2. Earthworms-Vermi culture &Vermicomposting by R. K. Bhatnagar & R. K. Palta, Kalyani Pub, New Delhi, Kolkotta,Hydarabad.
3. A hand book of organic farming by A. K. Sharma, Agrobios (India), Jodhpur
4. A handbook of soil, fertilizer and manure by P. K. Gupta, , Agrobios (India), Jodhpur
5. Organic farming in India-problems and practice by U. Thapa & P. Tripathy, Agro pub. Academy, Udaipur-313002
6. Organic Farming for sustainable agriculture by A. K. Dahama, Agrobios (India), Jodhpur
7. Organic Farming – theory and practice by SP. Palaniappan & K. Annadurai, Scientific Pub. (India), Jodhpur.
8. Organic Farming in India byS. S. Purohit & Dushayant Gehlot, Agrobios (India), Jodhpur
9. Role of earthworms in agriculture by J.V.Bhatt & S.R. Khambata, ICAR, New Delhi.
10. Quantitative analysis of waters, fertilizers, plants and soils by U.S.Sree Ramulu, Scientific Pub. Jodhpur.

Tools and Equipments to be required in running the course.

Spade, Belcha, Water sprayer, Thermometer, Sieve (4' x 3'), Microscope, Soil testing kit, Chemical balance, Mixing machine, Pouch sealing machine, Bag sealing machine, Gunny bags, pH meter, pH indicator strips, Spots related to vermitechnology, Culture of earthworm (*Eisenia foetida*), Cowdung, biodegradable biomass etc.

**Composting beds and Permanent Production Shed size 30ft. X 20ft. should be available for practical training.

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Sd/- B.C. Borah
Deputy Registrar (Academic)
Dibrugarh University