



THE MADURA COLLEGE (Autonomous), MADURAI – 625 011
(AFFILIATED TO MADURAI KAMARAJ UNIVERSITY)
RE-ACCREDITED (3rd Cycle) WITH “A” GRADE BY NAAC

PROGRAMME : B.A., Tamil
COURSE TITLE : சுவடியியல்
TIME : 2 Hours

COURSE CODE : 20U3TAD1
QN.NO : 10212
MAX.MARKS : 75

பாட நோக்கம்

சுவடிகளில் தமிழ் எழுத்துக்கள் எவ்வாறு எழுதப்பட்டன, அவற்றைப் பதிப்பித்த ஆளுமைகள் எத்தகைய இடையூறுகளை எதிர்கொண்டிருப்பர் போன்றவற்றைத் தற்கால மாணவர்கள் அறிந்து கொள்ள வேண்டும் என்ற நோக்கில் இப்பாடத்திட்டம் வைக்கப்பட்டுள்ளது.

பாடத்தின் பயன்பாடு

- ✓ சுவடிகளைப் படிக்கும் அறிவைப் பெறுவர்.
- ✓ சுவடிகளில் உள்ளவற்றைப் பதிப்பிக்கும் ஆர்வம் அடைவர்.
- ✓ மூலபாடத் திறனாய்வு குறித்து விழிப்படைவர்.

விதிமுறைமை

- இப்பாடம் 2020-2021ஆம் கல்வி ஆண்டு முதல் இளங்கலைத் தமிழ்த்துறையில் சேரும் மாணவர்களுக்கு உரியது.
- வழக்கமாக இருக்கும் பாடத்திட்டத்தோடு கூடுதல் பாடமாக இது கற்பிக்கப்படும்.
- இப்பாடம் 30 மணிநேர வகுப்புகள் உடையது.
- வழக்கமான கல்லூரி நேரம் முடிந்தபின் வகுப்புகள் நடைபெறும்.

சுவடியியல் – கூடுதல் கல்வி

பாடப்பிரிவு

அலகு : 1

சுவடியியல் – சொற்பொருள் விளக்கம் – தோற்றமும் வளர்ச்சியும் – அமைப்பும் வகையும் – எழுதுபொருட்கள், ஏடு தயாரித்தல், பதப்படுத்தல், சுவடியமைப்பு – சுவடிகளின் வகை – பழஞ்சுவடிகள்.

அலகு : 2

காலந்தோறும் சுவடி – அழிவு – சுவடி திரட்டுதல் – சங்க காலம் – இடைக்காலம் – பிற்காலம் – சுவடிதிரட்டும் முறைகள் – எடுத்தல், காத்தல், பயன்பாடு.

அலகு : 3

சுவடி ஆய்வு – இடம், பொருள், காலம், வடிவம் தன்மை – மூலப்பாட ஆய்வு – தேர்வுமுறை – வகைப்படுத்தும் முறை – காலம் அறிதல் – வரிசைப்படுத்தல் – வேறுபாடுகள் அறிதல்.

அலகு : 4

பதிப்பு முறையும் வகையும் – படியெடுத்தல் – சிக்கல் திறக்கும் வழி – எழுத்துமுறை – பாட்டு அமைப்பு – ஒப்பிடும் பணி – மீட்டுருவாக்கம் – பதிப்பு வகை – முன்னோடிகள் – பதிப்பின் காலம் – இலக்கண இலக்கிய பதிப்புகள்

P.T.O..

அலகு : 5

சுவடி பதிப்புப் பணிகள் – பிரிப்பு முறை – வரன்முறை – நிறுத்தற் குறிகள் – அடிக்குறிப்பு போன்றவை – அச்ச – அச்சமுறை – கண்காணிப்பு – பாடபேதம் – தமிழ்ச்சுவடி உள்ள இடங்கள், சுவடிப்பதிப்பு – செவ்விலக்கியப் பதிப்பாசிரியர்கள் – சுவடிகளைக் கண்டடைந்தோர்.

பாடநூல்கள்:

1. சுவடி இயல் – முனைவர் பூ. சுப்பிரமணியம், 2018. உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை -13.
2. சுவடிக்கலை, இரா. இளங்குமரனார், 1996, அரிமா பதிப்பகம், சேலம்.

பார்வை நூல்கள்:

1. மூல பாட ஆய்வியல், அ. விநாயக மூர்த்தி, 1979, பால முருகன் பதிப்பகம், மதுரை-11.
2. சுவடிப் பதிப்பு நெறிமுறைகள் – த.கோ.பரமசிவம், தமிழ்ப் பல்கலைக்கழகம் 1981.தஞ்சாவூர்.
3. பதிப்பியல் சிந்தனைகள் – இ.சுந்தர மூர்த்தி, 2010, நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை -18.

இணையம்

1. <https://www.tnarch.gov.in/ta/manuscript>
2. <http://www.tamilvu.org/library/suvadi/html/index.htm>
3. <https://www.tamiluniversity.ac.in/tamil/>

புறத்தேர்வில் ஒவ்வொரு பகுதிக்குமான மதிப்பெண்கள்

விவரம்	பகுதி அ (சரியான விடையைத் தேர்ந்தெடுத்தல்)	பகுதி ஆ (கட்டுரை வினா)	மொத்தம்
கேட்கப்பட வேண்டிய வினாக்கள்	10	7	
விடையளிக்கப்பட வேண்டிய வினாக்கள்	10	4	
ஒவ்வொரு வினாவிற்குமான மதிப்பெண்கள்	1	10	
மொத்த மதிப்பெண்கள்	10	40	50



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PROGRAMME : B.A., English
COURSE TITLE : Career Skills
TIME : 2 Hours

COURSECODE : 20U3NAD1
COURSE NO : 10412
MAX.MARKS :50

Course Objectives:

- To develop positive attitude towards study and work
- To evaluate their own strength and to build on their own areas of development
- To motivate students engage in career planning
- To encourage students’ academic, social, emotional and personal development
- To understand and develop the skills that required for the successful future

Unit	Course Contents	Hours
I	Interpersonal Skills <ul style="list-style-type: none">• Communication Skills	6hrs.
II	Interpersonal Skills <ul style="list-style-type: none">• Telephone Etiquette	6hrs.
III	Interpersonal Skills <ul style="list-style-type: none">• Presentation Skills	6hrs.
IV	Cognitive Skills <ul style="list-style-type: none">• Self-Esteem• Self- Motivation	6hrs.
V	Cognitive Skills <ul style="list-style-type: none">• Organization Skills• Confidence building skills	6hrs.

Textbook:

1. Hasson, Gill. “*Brilliant Communication Skills*”. Pearson Education, 2012.
2. Hughes, Shirley. “*Professional Presentation: A Guide to the Preparation and Performance of Successful Business Presentation*”. McGraw- Hill, 1990.

Reference Books:

1. Adair, John. “*Effective Communication*”. Pan MacMillan Ltd, 2003.
2. Collins, Patrick. “*Speak with Power and Confidence*”. Sterling, 2009.
3. Love, Nicholas. “*Pathfinder: How to Choose or Change Your Career for a Lifetime of satisfaction or Success*”. Touchstone Books, 2012.
4. Raman, Meenakshi and Sangeeta Sharma. Technical Communication: Principles and Practice”. Second Edition. Oxford University Press, 2011.

Website References:

- <http://networketiquette.net/>
- [http://users3.ev1.net/~pamthompson/body language.htm](http://users3.ev1.net/~pamthompson/body_language.htm)
- <http://www.dailywritingtips.com/>
- <http://www.albion.com/netiquette/corerules.html>

Pedagogy:

Powerpoint Presentation, Chalk and Talk, Group Discussion, Seminar, Puzzle, Cross Word, Word Power, Pep Talk, Quiz and Tutorial.

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PROGRAMME : B.A., Economics

COURSECODE : 20U3VAD1

COURSE TITLE : Rural Development

COURSE NO : 10512

TIME : 2 Hours

MAX.MARKS :50

Objectives

To enable the students to understand the real situation of rural development and the various programmes related to rural development.

Learning Outcome

On successful completion of the course, the student will be able to

- Gain insight into the socio-economic structure of rural India
- Understand the prospects and problems of rural development in India

UNIT-I: Introduction to Rural Development (6 Hours)

Meaning – Socio-Economic structure of Rural India – Need for studying Rural Economics – Planning and Issues of Rural Development – Pre and Post-Independence.

UNIT-II Rural Development Theories (6 Hours)

W. W. Rostow's Theory of Stages – Lewis – Fei-Ranis Model and Gandhian Approach to Rural Development.

UNIT-III: Approaches to Rural Development (6 Hours)

Approaches in Agriculture and Rural Development – Water Management – Energy Management – Modern Agricultural Technology – Rural Industrialization – Rural Marketing.

UNIT-IV: Rural Empowerment Programmes (6 Hours)

Poverty – poverty Measurements – MGNREGA – PM Aatma Nirbhar Swath Bharat Yojana – NGO, SHGs – Rural Sanitation PURA – Gram Panjayat Development Plan – Training to Rural Youth for Self Employment (TRYSEM).

UNIT-V: Financing Rural Development (6 Hours)

Government – Semi – Government Organisation – Co-operative Institutions – NGOs, and Voluntary Agencies for Rural development.

Book for Study

1. Vasant Desai, **Rural Development in India**, Mumbai, Himalaya Publishing House, 2005.

Books for Reference

1. Gangaiah, **Rural Housing Schemes and Policies: A study**, New Delhi, Serials Publications, 2012.
2. Kulwant Raj Gupta, **Rural Development in India**, New Delhi, Atlantic Publishers, 2004.
3. Patil, Jayant., **Agricultural and Rural Reconstruction**, New Delhi, Concept Publishing Co, 1998.
4. Prasad, R.R. and Rajinikanth, G., **(Edited) Rural Development and Social Change**, Vol I & II, National Institute of Rural Development, Hyderabad, 2006.

EVALUATION PATTERN

II. End Semester Exam Components for Add on Courses

Time : 2 Hours

Maximum Marks : 50

Part – A (10 x 1 = 10 Marks)

Answer **All** questions (Multiple Choice Questions)

Part – B (4 x 10 = 40 Marks)

Answer **Any Four** out of Seven Questions (Descriptive Type Questions)



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RE-ACCREDITED (3rd Cycle) WITH “A” GRADE BY NAAC

PROGRAMME : B.Sc., Mathematics

COURSE TITLE : Number Systems and Boolean Algebra

TIME : 2 Hours

COURSECODE : 20U3MAD1

COURSE NO : 10612

MAX.MARKS :50

Unit – 1

Binary – Decimal – Octal – Hexadecimal – Definitions – Examples – Conversions.

Unit – 2

Boolean Algebra – Definition – Examples – Problems – Boolean Algebra thro Lattices.

Unit – 3

Properties of Boolean Algebra – Problems based on these properties.

Unit – 4

Boolean function – Boolean expressions – Min terms and Max terms – Boolean function in min terms or max terms.

Unit – 5

Canonical forms or Normal forms – Method to find min term canonical forms – Simplification of Boolean functions – K-Maps – K-Maps with don't care conditions.

Books for Study

1. Switching Theory and Finite Automata Theory by Zvikhavi and Niraj K. Tha, Third Edition 2009, Cambridge University Press.
Chapter: 1 only (For Unit – 1).
2. Discrete Mathematics for Computer Science Courses by P. Duraipandia, Muhil Publishers, First Edition 2008.
Chapter: 10 only (For Unit -2 to Unit – 5).

Books for References:

1. Computer Fundamentals and Programming in C by Anita Goel and Ajay Mittal, Second Impression (2014), Pearson (India).
2. Switching Theory and Logic Design by A.P Godse and D.A. Godse, First Edition 2009, Technical Publications.

Evaluation pattern for Add-on courses

Internal Components (CIA):50 Marks

Component	Allocation	Suggestive evaluation types (Any one Option)
I	20%	Periodic Assignments (3 Nos./Mini Project/Case Studies
II	15%	Paper Presentation/Group Discussion/Criticism of a Book /Oratorical Skill
III	15%	Quiz/Viva-Voce (Related to the Paper)/Innovative Experiment Modeling
Total	50%	

External Components: 50 Marks

External examination duration : 2 hours

Question paper pattern:

Part – A (Multiple Choice type) (10 X 1 = 10 Marks)

Part – B ((Descriptive type) (4 out of 7 Questions to be answered) (4 X 10 = 40 Marks)

Evaluation pattern for Self-study courses

Assessment components	Marks
Assignments (minimum 2)	25%
Project/innovative experimental design	25%
Paper presentation/ viva voce	25%
Internal test	25%
Total	100%



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RE-ACCREDITED (3rd Cycle) WITH “A” GRADE BY NAAC

PROGRAMME : B.Sc., Physics

COURSECODE : 20U3PAD1

COURSE TITLE : How Stuff Works

COURSE NO : 10816

TIME : 2 Hours

MAX.MARKS :50

Unit I : House hold Appliances

Airconditioner –Air-conditioning basics- The parts of an Air Conditioner – Window and split-system AC Units – Chilled water and cooling tower AC units – BTU and EER – Energy efficient cooling systems- Water Filter –Water filter basics – Choosing a water filter – Water filter troubleshooting – Other ways to purify water - Reverse Osmosis- Osmosis down, Flip it and reverse it –Usage of reverse osmosis – smaller scale applications of reverse osmosis – Disadvantage of reverse osmosis - Washing Machine – cleaning clothes – Inside a washing machine – Plumbing – Pump – Drive mechanism – Inside the gearbox – Controls.

Unit II: Kitchen Appliances

Refrigerator- The purpose of refrigeration – Parts of a refrigerator – Understanding Refrigeration – the refrigeration cycle – Gas and propane refrigerators – Electric and solar coolers – Cold packs - Microwave oven- Blender – Blender mechanics – Types of blenders – Shopping for blenders.

Unit III: Medical Diagnostics

Pulseoximeter – Introductioin – Oxygen saturation – Physical properties used in pulse oximetry – Calibration - Pulse oximeters measure pulsatile arterial blood -Signal is very small– Plethysmographic trace (pleth)- Light source – Coping with ambient light - Poblems associated with using pulse oximeters - Ultrasound - Introduction to sound and ultrasound- Sending and receiving ultrasound - Interaction of ultrasound with body tissues- Scanning modes : A scan, B scan - Frequency, Wavelength, Resolution, and Depth - Doppler Effect– MRI - Strange world of quantum physics and spin - Detection of hydrogen nuclei - How the MRI machine is able to target different areas of the body - Receiver coils - Magnet and Quenching - Noise : The ” Gradient Coil Guitar “ - Anesthesia and MRI.

Unit IV: Digital Photocopying Devices

Photocopier –The basics – Photoreceptor drum – Corona wires – Lamp and Lenses – Toner - Scanner –Anatomy of a scanner – The scanning process – Resolution and interpolation – Image transfer - Fax Machine – Basic Idea behind fax machines – Modern fax machines – Receiving a fax – How to use a fax machine – fax machine troubleshooting – portable fax machines– Printer – The basics of Sattic electricity , drum, fuser – The controller : the conversation, the language , setting up the page – The laser assembly – Writing the page – Toner basics – Applying the toner – Color printers – Advantage of a laser printer.

Unit V: Electrical Safety

Electric shock - Resistive heating - Spark ignition sources – Guarding – Grounding - Circuit Protection Devices - Safe work practices.

P.T.O.

Web resources:**Unit I :**

Airconditioner

<https://home.howstuffworks.com/ac.htm/printable>

Water Filter

<https://adventure.howstuffworks.com/outdoor-activities/hiking/water-filter.htm>

Reverse Osmosis

<https://science.howstuffworks.com/reverse-osmosis.htm>

Washing Machine

<https://home.howstuffworks.com/washer.htm/printable>

Unit II :

Refrigerator

<https://home.howstuffworks.com/refrigerator.htm/printable>

Microwave oven

<https://home.howstuffworks.com/microwave1.htm>

Blenders

<https://home.howstuffworks.com/blender.htm/printable>

Unit III :

Pulse oximeter

https://www.howequipmentworks.com/pulse_oximeter/

Ultrasound

https://www.howequipmentworks.com/ultrasound_basics/

MRI

https://www.howequipmentworks.com/mri_basics/

Unit IV :

Photocopier

<https://home.howstuffworks.com/photocopier.htm/printable>

Scanner

<https://computer.howstuffworks.com/scanner.htm/printable>

Fax Machine

<https://electronics.howstuffworks.com/gadgets/fax/fax-machine.htm/printable>

Printer

<https://computer.howstuffworks.com/laser-printer.htm/printable>

Unit V:

Electrical Safety

<https://fens.sabanciuniv.edu/en/preventing-electrical-hazards>

https://www.howequipmentworks.com/electrical_safety/

P.T.O.

Evaluation pattern for Add-on courses

Internal evaluation : 50 % marks

External evaluation : 50 % marks

Continuous Internal Assessment components	Marks
Periodic Assignment (3 nos)/mini project	20 %
Paper presentation/seminar	15 %
Quiz/Viva-voce (related to the paper) / Innovative experiment modeling	15 %
Total	50%

External examination duration : 2 hours

Question paper pattern:

Part-A (Multiple choice type) (10 x 1 = 10 marks)

Part- B (Descriptive type) (4 out of 7 questions to be answered) (4 x 10 = 40 marks)

Evaluation pattern for Self-study courses

Assessment components	Marks
Assignments (minimum 2)	25%
Project/innovative experimental design	25%
Paper presentation/ viva voce	25%
Internal test	25%
Total	100%

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SEMESTER EXAMINATIONS – NOVEMBER 2021*

PROGRAMME : B.Sc., Chemistry

COURSE CODE: 20U3CAD1

COURSE TITLE : Cosmetics and Biochemistry

COURSE NO : 10917

TIME : 2 Hours

MAX.MARKS :50

UNIT I - Chemistry of cosmetics and perfumes

(6 hours)

A General study including preparation and uses of the following:

Hair dye, hair spray, shampoo, Suntan lotions, Face Powder, Lipsticks, Talcum Powder, Nail enamel, Creams (Cold, Vanishing and Shaving Creams), Antiperspirants and artificial flavours. Essential oils and their importance in Cosmetic industries with reference to Eugenol, Geraniol, Sandalwood oil, jasmone, 2-phenylethyl alcohol, Eucalyptus, Civetone, Muscone.

UNIT II - Pesticide Chemistry

(6 hours)

General Introduction to pesticides (Natural and Synthetic), benefits and advance effects, Changing Concept of pesticides, Structural activity relationship, Synthesis and technical manufacture and use of representative pesticides in the following classes: Organo chlorides (DDT, Gammexene); Organo phosphate (Malation, Parathion); Carbamate (Carbofuran and Carbaryl); Quinones (Chloranil), Anilides (alachlor and Butachlor)

UNIT III – Fermentation

(6 hours)

Aerobic and anaerobic fermentation, Production of (i) Ethyl alcohol and Citric acid (ii) Antibiotics Penicillin, Cephalosporin, Chloromycetin and Streptomycin (iii) Lysine, Glutamic acid, Vitamin B2, Vitamin C. Preparation of Aspirin and Magnesium bisilicate (Antacid)

UNIT IV - Business Skills for chemists

(6 hours)

Key business concepts: Business plans, Market need, Market used, Project management and routes to market. Chemistry in Industry: Current Challenges and Opportunities for the Chemistry & using Industries, Role of Chemistry in India and global economics. Making money: Financial aspects of business with case studies. Intellectual property: Concept of intellectual property, patents.

UNIT V - Biochemistry of disease

(6 hours)

A diagnostic approach by blood/urine analysis.

Blood: Composition and function of blood and preservation of sample, Anaemia, Regulation, estimation and interpretation for blood sugar, urea creatinine, cholesterol and bilirubin.

Urine: Collection and preservation of samples formation of urine. Composition and estimation of constituents of normal and pathological urine.

References:

1. Patrick.G. (2017), Introduction to Medicinal Chemistry, Oxford University Press.
2. Singh.H; Kapoor S.K (1996), Medicinal and Pharmaceutical Chemistry, VallabhPrakashan.
3. Foye,W.O.Lemke, T.L: William, D.A(1995), Principles of Medicinal Chemistry, B.I.WaverlyPvt.Ltd.
4. Devlin, T.M. (2010), Textbook of Biochemistry with Clinical Correlation, Wiley.
5. Berg, J.M.; Tymoczko, J.L.; Stryer, L(2002), Biochemistry, W.H.Freeman.
6. Pandey, N.; Dharmi, K.(2014), Intellectual Property Rights, PHI Learning Pvt.
7. Ganguli, P. (2001), Intellectual Property Rights: Unleashing the knowledge, McGraw Hill.
8. Barel, A.O.; Paye, M.; Maibach, H.I.(2014). Handbook of Cosmetic Science and Technology, CRC Press.
9. Gupta, P.K; Gupta, S.K.(2011), Pharmaceutics and Cosmetics, PragatiPrakashan.
10. Kumar,R.(2018).Chemistry of Cosmetics, Prestige Publisher.

P.T.O.

FOR ADD ON COURSES:

Evaluation:

Continuous Internal Assessment	:	50 Marks
External Assessment	:	50 Marks
Total	:	100 Marks

- ✓ Evaluation by internal examiner

CIA Components

Component	Evaluation type	Marks
I	Periodic assignment (3)	20
II	Paper presentation/Group discussion	15
III	Quiz/viva-voce	15

For Final Semester Examinations:

- ✓ Total end semester examination marks : 50
✓ Duration : 2 hours
✓ Exam pattern:

Part	Type	No. of questions	Marks per question	No. of questions to be answered	Total Marks
A	Objective	10	1	10	10
B	Descriptive	7	10	4	40
Total Marks					50

- ✓ Minimum pass marks : 40 (Both CIA & end semester exams put together)
✓ There is no pass minimum separately for internal and external components.

FOR SELF-STUDY COURSES:

- ✓ Duration of the course : 1 year
✓ Evaluation by internal examiner
✓ Minimum pass marks : 40 (Both CIA & end semester exams put together)
✓ There is no pass minimum separately for internal and external components.

Assessment type		Marks
Internal examination	Part – A – Objective type Answer ALL questions - (10 x 1 = 10 Marks)	10
	Part – B – Descriptive type, Open choice Answer ANY THREE questions (3/5 x 5 = 15 Marks)	15
Assignment (2)		25
Project / Case study		25
Seminar/model		25
Total Marks		100

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PROGRAMME : B.Sc., Botany
COURSE TITLE : Crop Varieties
TIME : 2 Hours

COURSECODE : 20U3BAD1
COURSE NO : 11015
MAX.MARKS :50

Course objectives: The course will enable the students

1. To impart knowledge on the cultivation practices and characteristic qualities of crop varieties
2. To acquaint and keep abreast with the global trends in essential commodities.

Unit I Cereals and millets (6 hours)

Brief account on list of varieties, region and practices of cultivation, characteristic qualities and market value of Rice, Wheat, Corn Maize, millets.

Unit II Pulses (6 hours)

Brief account on list of varieties, region and practices of cultivation, characteristic qualities and market value of Bengal gram, pigeon pea, soybean, garden pea, black gram and green gram

Unit III Nuts (6 hours)

Brief account on list of varieties, region and practices of cultivation, characteristic qualities and market value of Groundnut, Almond, Cashew nut, Pista and Walnut.

Unit IV Fruits (6 hours)

Brief account on list of varieties, region and practices of cultivation, characteristic qualities and market value of Mango, Banana, grapes, Apple, Sapota and Guava

Unit V Vegetables (6 hours)

Brief account on list of varieties, region and practices of cultivation, characteristic qualities and market value of Potato, Brinjal, Tomato, Onion, Cabbage and Beans

Books for Study

1. Pandey B. P. (1978), Economic Botany, S. Chand Publishing Company., New Delhi.
- Verma V. (1974). A Text book of Economic Botany, Emcay publication. New Delhi.
2. Hill.A.(1976).Economic botany Tata McGraw Hill Publishing Co;Ltd.New Delhi.
3. Bendre A. Kumar A Economic Botany, Rastogi Publication, New Delhi.

Books for References

1. Kochar .S.L.(2011). Economic Botany in Tropics McMillan Publications New Delhi.
2. Wickens, G.E. (2001). Economic Botany. Principles & Practices, Kluwer Academic Publishers
The Netherlands.
3. Sambhamurthy.A.V.S.S&Subramanian .N.S: A textbook of Economic botany,Wiley
Eastern ltd, New Delhi.

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PROGRAMME : B.Sc., Zoology
COURSE TITLE : Health Education
TIME : 2 Hours

COURSECODE : 20U3ZAD1
COURSE NO : 11117
MAX.MARKS :50

Course Objectives

1. To understand the concepts of health.
2. To discuss the balanced diet and nutritional deficiency diseases.
3. To analyze the problems of infertility, combating methods and birth control measures.
4. To appraise the communicable and non communicable diseases.
5. To create awareness on health, nutrition and environment.

Unit	Description	Hours
I	Concepts of Health Physical Health - Mental Health - Occupational Health - Social Health - Natural History of Diseases - The Disease Agents - Health Planning and Management.	6
II	Nutrition and Health Balanced diet and requirements - Nutritional deficiency diseases - Prevention and Treatment.	6
III	Reproductive Biology Fertility – Problems of male and female Infertility- Combating methods- IVF- GIFT-Test tube babies - Birth control measures.	6
IV	Environment and Health Water pollution - Purification of water - Air pollution and health - Solid waste disposal and control.	6
V	Communicable and Non Communicable Diseases Respiratory infections – Tuberculosis and COVID-19, Intestinal infections – Typhoid and cholera, Arthropod borne infections – Malaria and Dengue, Causative agents - Pathogenecity - Mode of Transmission-Symptoms –Treatment. Cancer, Diabetes, Cardio vascular diseases - Care and control.	6

References

1. Balinsky B.I., 1981. *An Introduction to Embryology*, 5th Ed., Holt –Saunders International, Philadelphia, London
2. Berril N.J., 1980. *Developmental Biology*. Tata McGrawHill Pub. Company Ltd., New Delhi.
3. De Hart. G. B., Sroufe. L.A., and Cooper. R.G., 2000. *Child development – its nature and course*, 4th ed., MC Graw Pub., Boston.
4. Park, K., 2019. *Preventive and Social Medicine*, 25th Ed. M/s Banarsidas Bhanot Publishers, Jaipur.

Web resource

<https://acphd.org/communicable-disease/>
<https://www.medicalnewstoday.com/articles/communicable-diseases>
<https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases>
<https://www.sciencedirect.com/topics/medicine-and-dentistry/non-communicable-disease>
https://www.health.ny.gov/diseases/communicable/arboviral/fact_sheet.htm#:~:text=These%20infections%20usually%20occur%20during,%2C%20Yellow%20Fever%2C%20and%20Zika.

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PROGRAMME: B.Sc., Computer Science

COURSE TITLE : Statistics with R Programming

TIME : 2 Hours

COURSE CODE : 20U3DAD1

COURSE NO : 11214

MAX.MARKS :50

COURSE OBJECTIVES :

- To impart computer programming knowledge using R programming language with object oriented programming technique.
- To teach how to apply the R programming from a statistical perspective.

Units	TOPICS	Total Hours: 30
Unit -1	Introduction-How to run R- R Sessions- and Functions- Basic Math- Variables- Data Types- Vectors- Conclusion- Advanced Data Structures- Data Frames- Lists- Matrices- Arrays- Classes.	6 hrs
Unit-2	R Programming Structures- Control Statements- Loops- – Looping Over Nonvector Sets-- If-Else- Arithmetic- and Boolean Operators and values- Default Values for Argument- Return Values- Deciding Whether to explicitly call return- Returning Complex Objects- Functions are Objective- Recursion- A Quicksort Implementation-Extended Extended Example: A Binary Search Tree.	6 hrs
Unit-3	Doing Math and Simulation in R- Math Function- Extended Example Calculating Probability- Cumulative Sums and Products-Minima and Maxima- Calculus- Functions for Statistical Distribution- Sorting	6 hrs
Unit-4	Linear Algebra Operation on Vectors and Matrices- Extended Example: Vector cross Product- Extended Example: Finding Stationary Distribution of Markov Chains- Set Operation- Input /out put- Accessing the Keyboard and Monitor- Reading and writer File	6 hrs
Unit-5	Graphics- Creating Graphs- The Workhorse of R Base Graphics- the plot() Function – Customizing Graphs- Saving Graphs to Files.	6 hrs

TEXT BOOKS:

- 1) The Art of R Programming- A K Verma- Cengage Learning.
- 2) R for Everyone- Lander- Pearson
- 3) The Art of R Programming- Norman Matloff- No starch Press.

REFERENCE BOOKS:

- 1) R Cookbook- Paul Teetor- Oreilly.
- 2) R in Action- Rob Kabacoff- Manning

P.T.O.

COURSE OUTCOMES:

On the completion of the course the students will be able to

COs	COURSE OUTCOME	Knowledge Level (basis of Bloom's Taxonomy)
CO-1	Understand the logic and basic functions and sessions of R programming	Up to K2
CO-2	Develop programs to demonstrate the creation of complex objects, Recursion and binary search algorithm.	Up to K3
CO-3	Construct programs to process specific application programs using functions of R programming using statistical distribution	Up to K3
CO-4	Compose programs to generate vector cross products and distribution of Markov chains.	Up to K4
CO-5	Develop programs to generate graphs and customising graphs.	Up to K3

MAPPING OF COs WITH PSOs:

Course Outcomes	PSO 1 (Knowledge Base)	PSO 2 (Problem Analysis & Investigation)	PSO 3 (Communication Skills & Design)	PSO 4 (Individual and Team Work)	PSO 5 (Professionalism Ethics and equity)	PSO 6 (Life Long Learning)
CO-1	2	2	2	1	1	1
CO-2	2	2	2	1	1	2
CO-3	2	2	2	1	1	2
CO-4	2	2	2	1	1	2
CO-5	2	1	2	3	2	1

3- Advanced Application

2- Intermediate

1- Introductory

External examination duration: 2 hours

Question paper pattern

Part-A Multiple choice type

10 x 1 = 10 marks

Part- B Descriptive type [4 out of 7]

4 x 10 = 40 marks

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SEMESTER EXAMINATIONS – NOVEMBER 2021*

PROGRAMME: B.Sc., Information Tech.

COURSE CODE : 20U3FAD1

COURSE TITLE : R Programming

COURSE NO : 11314

TIME : 2 Hours

MAX.MARKS :50

Course Objectives

1. To understand the basics in R programming.
2. To understand the use of Multidimensional Arrays and Data Frames.
3. Learn to feed data into R.
4. Able to apply Control Statements and Functions.
5. To impart knowledge in OOPs.

UNIT	CONTENT	HOURS
I	Basics of R - Basic Math – Variables - Data Types – Vectors - Calling Functions - Function – Documentation - Missing Data – Pipes.	6
II	Advanced Data Structures – data frames – Lists – Matrices – Arrays.	6
III	Reading Data into R - Reading CSVs - Excel Data - Reading from Databases - Data from Other Statistical Tools - R Binary Files - Data Included with R - Extract Data from Web Sites - Reading JSON Data.	6
IV	Writing R functions - Hello, World! - Function Arguments - Return Values – do call - Control Statements - if and else – switch – if else - Compound Tests - Loops, the Un-R Way to Iterate - for Loops - while	6
V	Starting out: Working with Objects – Manipulating Objects – Viewing objects within objects – Constructing Data Objects – Forms of Data Objects – Testing and Converting.	6

Books for Study

1. R for Everyone: Advanced Analytics and Graphics by Jared P. Lander Addison, Wesley Data & Analytics Series, 2013.
2. Art of R Programming: A Tour of Statistical Software Design by Norman Matloff, No Starch Press, 2011.

Chapters:

Book 1:

Unit I: 4

Unit II: 5

Unit III: 6

Unit IV: 8,9,10

Book 2:

Unit V: 3

P.T.O.

Books for Reference

1. Beginning R – The Statistical Programming Language by Mark Gardener, Wiley, 2013
2. Robert Knell – “Introductory R: A Beginner's Guide to Data Visualisation, Statistical Analysis and Programming in R” - Amazon Digital South Asia Services Inc, 2013.

Web Resources

1. <https://elearningindustry.com/applications-r-programming>.
2. <https://www.tutorialspoint.com/r/index.htm>
3. https://www.tutorialspoint.com/r/r_basic_syntax.htm

Pedagogy

Chalk and talk, Materials, PPT, Assignment, Seminar, Problem solving, Group discussion, Interaction and Demonstration.

Blue Print – Model for Add-On Course

Internal Assessment

Distribution of Section – wise Marks

Section	Components	Marks
Section A	Project / Assignment / Quiz	15
Section B	Modeling / Creativity	15
Section C	Innovation in Experiment	20
	Total	50

Blue Print – Model for Add-On Course

External Examination

Description	Section A MCQs	Section B (Open Choice)	Total
No. of Questions to be asked	10	7	
No. of Questions to be answered	10	4	
Marks for each question	1	10	
Total Marks for each section	10	40	50

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PROGRAMME : B.Sc.,
COURSE TITLE : Biofertilizers and
Biopesticides

COURSE CODE : 20U3RAD1
QN.NO : 11415

TIME : 2 Hours

MAX.MARKS :75

Course Objectives:

1. To know the history and importance of biofertilizers and biopesticides
2. To analyze the interactions of biofertilizer with plant and soil system
3. To compare the uses of conventional and nano fertilizers
4. To explore the mechanisms used by biofertilizers and biopesticides
5. To recognize the roles of biofertilizer and biopesticides for the prevention plant diseases and improve yield

Course Learning Outcome:

n successful completion of the programme, the students will be able to

1. Understand the history and importance of biofertilizers and biopesticides
2. Discuss the interactions of biofertilizer with plant and soil system
3. Compare and contrast the uses of conventional and nano fertilizers
4. Explore the mechanisms used by biofertilizers and biopesticides
5. Recognize the roles of biofertilizer and biopesticides for the prevention of plant diseases and improve yield

Unit	Description	Hours
I	Unit I: Biofertilizers and Mass Production Biofertilizers - introduction, status and scope. Structure and characteristic features of bacterial biofertilizers (<i>Rhizobium</i> , <i>Azospirillum</i> and <i>Azotobacter</i>). Mycorrhizal Biofertilizers - Non - Symbiotic Nitrogen Fixers- Phosphate Solubilizers - Mechanism of phosphate solubilization and phosphate mobilization, K solubilization. Strategies of Mass multiplication and packing.	6hrs
II	Unit II: Biopesticides and Mass Production History and concept of biopesticides. Classification of biopesticides viz. pathogen, botanical pesticides, and biorationales - Bioinsecticides. Mass production technology of bio-pesticides.	6hrs

III	Unit III: Mass cultivation and Carrier Materials Mass production of biofertilizers - <i>Rhizobium</i> . Properties and qualities- Peat, perlite, charcoal or soil aggregates, Alginate-perlite dry granule, Mineral soils, Composted sawdust, Agriperlite, , Kaolin, Celite, Diatom, Vermiculite, Wheat bran, sugarcane baggas, waste water sludge, Sterilization of Carrier materials- storage.	6hrs
IV	Unit IV: Biocontrol agents Definition, scope and importance of Biological control Microbial control, Production of biopesticide based on Fungi (<i>Trichoderma</i>), bacteria (<i>Bacillus thuringiensis</i>), Viruses and Nematodes. Mechanism of disease control by bioagents.	6hrs
V	Unit V: Formulations and applications Liquid biofertilizers - Seed treatment- Root dipping- Soil application- foliar application - factors affecting quality of inoculants- Nano-fertilizers- Conventional-fertilizers- packing, Strategies of marking, Quality standard for biofertilizers and biopesticides.	6hrs

Total 30 Hours

Books for study

1. Kannaiyan, S. (2003). Bioetchnology of Biofertilizers, CHIPS, Texas.
2. Mahendra K. Rai (2005). Hand book of Microbial biofertilizers. The Haworth Press Inc., New York.
3. SubbaRao N.S (1995) Soil microorganisms and Plant growth. Oxford and IBH publishing co. Pvt. Ltd., New Delhi.

Books for reference

1. Burges, H.D. (1998) Formulation of Microbial Pesticides. Kluwer Academic Publishers, Boston.
2. Motsara, I.M.R., Bhattacharyya, P. and Srivastava, B. (1995). Biofertilizer Technology, Marketing and Usage- A Source Book-cum-glossary. FDCO, New Delhi.
3. SubbaRao, N.S. (1993). Biofertilizers in Agriculture and Forestry. Oxford and IBH. Publ. Co., New Delhi.

Web Resources

1. <https://www.epa.gov/ingredients-used-pesticide-products/what-are-biopesticides>
2. https://agritech.tnau.ac.in/farm_enterprises/Farm%20enterprises_%20bio%20pesticides.html

https://agritech.tnau.ac.in/ta/org_farm/orgfarm_biofertilizers.html

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PROGRAMME : B.Sc.,

COURSE TITLE : Reproductive Biology

TIME : 2 Hours

COURSE CODE : 20U3LAD1

QN.NO : 11513

MAX.MARKS :75

Course Objectives

1.	To learn the fundamental developmental processes
2.	To understand the fertilization and cleavage processes
3.	To acquire knowledge about Assisted Reproductive Technology

Unit	Description	Hours
I	Gametogenesis General introduction to reproductive biology, Spermatogenesis, Oogenesis, Egg membranes and organization of egg - yolk, pigments, egg cortex, Maturation of egg, Polarity and Symmetry.	6
II	Fertilization & activation Types of eggs - Polarity - Mechanism of fertilization-Monospermy and Polyspermy, Activation of egg and metabolism, Parthenogenesis.	6
III	Cleavage and Gastrulation Types of cleavage, Factors affecting cleavage, Blastulation, Gastrulation - Mechanism of morphogenetic movement, Metabolic and molecular changes during gastrulation; Cell motility and Differential cell affinity; Fate maps construction. Concept of organizer.	6
IV	Embryonic and postembryonic development Placenta – types and physiology, Metamorphosis and regeneration, Nucleo-cytoplasmic interactions, teratogenesis-causative agents.	6
V	Experimental embryology Concept of Assisted Reproductive Technology (ART) – Monitoring of ovulation phase, Super-ovulation and Cryopreservation, Sperm banking, Artificial insemination, IVF, Embryo transfer and Test tube babies.	6

Books for Study

1. Balinsky, BI. 2012. An introduction to Embryology. 5th Edition. Thomson Asia Pvt. Ltd.,Singapore
2. Jain, PC. 1994. Elements of Developmental Biology. Vishal Publications, Jalandhar, NewDelhi.
3. Verma, PS and Agarwal, VK. 2006. Chordate Embryology. S. Chand & Company Ltd., NewDelhi.

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PROGRAMME : B.Com.,

COURSE CODE : 20U3KAD1

**COURSE TITLE : Principles and Practices of
Co-operation**

QN.NO : 11716

TIME : 2 Hours

MAX.MARKS :75

Course Objectives		
<ul style="list-style-type: none">• To understand the basic concepts and Principles of Cooperation & contributions of various Cooperators to the field of Cooperation• To enable the students to distinguish Cooperation and other forms of business organizations• To gain comprehensive knowledge of cooperative movement of India• To acquaint knowledge on credit cooperatives• To acquaint knowledge on Non Credit co operatives		
Unit	Course Contents	Hours
I	Cooperation: Concept – Features – Benefits of Cooperation. Cooperative Principles: Meaning – Evolution of Cooperative Principles – Rochdale Principles – Reformulation of Cooperative Principles by ICA 1937, 1966 – ICA Cooperative Identify Statement 1995: Definition, Values and Principles	6
II	Cooperation and Other Forms of Economic Organizations’: Cooperation and Corporate concerns: Joint Stock Company and Partnership Firm, Cooperation and Public Utility Concerns, Trade Union, Self-Help Groups and Cooperatives.	6
III	Cooperative Movement in India: Cooperative development before and after independence – Cooperative development after new economic policy – Challenges for Cooperatives –New generation cooperatives	6
IV	Credit Cooperatives: Importance, structure, constitution, working performance and recent trends in the functioning of PACCS, CCBs, SCB, PCARDBs, SCARDBs, Urban Cooperative Banks – Housing Cooperatives – Industrial Cooperative Banks – Challenges and strategies	6
V	Non- Credit Cooperatives: Importance, structure, constitution, working performance and recent trends in the functioning of Marketing Cooperatives - Consumer Cooperatives - Weavers’ Cooperatives - Spinning Mills – Sugar Mills - Dairy Cooperatives – Industrial Cooperatives – Challenges and strategies	6

Book for Study

Hajela, T.N., (2010) *Cooperation: Principles, Problems and Practice*, Konark Publishing House, New Delhi

Books for Reference

- 1) Dubashi P.R. (1970), *Principles and Philosophy of Cooperation*, VAMNICM, Pune.
- 2) John Winfred A. and Kulandaiswamy V. (1986) *History of Cooperative Thought*, Rainbow Publications, Coimbatore
- 3) Krishnaswami O.R, (1989) *Fundamentals of Cooperation*, S.Chand & Co., New Delhi
- 4) Krishnaswami O.R, and Kulandaiswamy, V (1992) *Theory of Cooperation: An Indepth Analysis*, Shanma Publications, Coimbatore
- 5) Ravichandran, K and Nakkiran, S, (2009) *Cooperation: Theory and Practice*, Abijit Publications, Delhi.

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