

During the current year (2017-18) the following are the value added courses offered by the college

Sl.No	Value Added Courses Offered (2017-18)	Nature of Course	Code	No. of Students Enrolled	No. of Students Completed
1	Business English Certificate Course	Certificate Course & Value Added Course	BEC	51	51
2	Fresh water aquarium maintenance and management	Certificate Course & Value Added Course	AQM	30	30
3	Writing and Presentation skills	Value Added Course	AUEN311.1	600	600
4	Business Communication	Value Added Course	APTT143	15	15
5	Language skill development course- Hindi	Certificate Course & Value Added Course	LSCH	25	25
6	Language skill development course- Tamil	Certificate Course & Value Added Course	TLC	15	15
7	UGC supported coaching programmes for the NET	Certificate Course & Value Added Course	NA	21	21
8	Civil Services Coaching Programme	Certificate Course & Value Added Course	NA	13	13
9	Karate Training Programme for Lady students	Certificate Course & Value Added Course	KTP	20	20
10	Sewing classes for Lady students	Certificate Course & Value Added Course	SWL	20	20
11	Special Course on Environmental science		AUEN211.1	400	400

12	Galileo Ticketing package course	Certificate Course & Value Added Course	GTPC	9	9
13	NET Coaching for MA Malayalam-Initiated by the Institution	Certificate Course & Value Added Course	NA	26	26
14	Health and Fitness Education	Value Added Course	PE1551	70	70
15	Communicative applications in English (Open course Dept. of English)	Value Added Course	AUEN 581.2	25	25
16	Health and sex education-Zoology	Value Added Course	AUZO.581.b	70	70
17	Horticulture (Botany)	Value Added Course	AUBO.581.b	35	35
18	Food and Dairy(Biotechnology)	Value Added Course	AUBB581.b	45	45
19	Creative writing in English(English)	Value Added Course	AUEN 691.1a	55	55
20	Creative writing in English and Malayalam (BVMC)	Value Added Course	AUML231	40	40
21	Apiculture	Value Added Course	AUZO 691.a	50	50
22	Aquaculture	Value Added Course	AUZO431	45	45
23	Listening and Speaking Skills	Value Added Course	AUEN 161.5a	600	600
24	Goods and Service Tax	Certificate Course & Value Added Course	GSTC	42	42
25	Refresher Programme in Molecular Biology Techniques	Certificate Course & Value Added Course	-	20	20

26	A course in Bioinformatics and Molecular Biology Tools for UG students	Certificate Course & Value Added Course	-	45	45
27	A Course in Bioinformatics and Molecular Biology Tools for PG Students	Certificate Course & Value Added Course	-	13	13
28	Certificate course in Yoga-Theory and Practice (2016-17)	Certificate Course & Value Added Course	-	21	21

VALUE ADDED CERTIFICATE COURSES

(Scheme & Syllabus)

1. Business English Certificate Course (BEC) -Offered by Dpt. English Language & Literature

For Details- www.mic.ac.in

2. Certificate Course in Yoga

Yoga as a medium for health promotion has acquired much significance in the context of changing life styles, environmental pollution and various health hazards. This course intends to acquaint students with basic theoretical inputs of yoga, aiming at physical and mental equilibrium.

Eligibility : Pass in plus two

Duration : 30 hours (2 hours per week) including practical and theory

Course Fee : Rs. 1500 (payable in the College Office)

Syllabus

Theory: 5 hours – Basic anatomy, Basic Physiology, Basic Pathology and introduction to Yoga definition, aim, benefits and philosophy of Yoga.

Practical: 25 hours – Surya Namaskaram, Sitting Asanas, Meditating Asanas, Cultural Asanas (lying down Asana – Supine and Prawn positions), Relaxing Asanas.

References:

1. Yoga by Sivananda,
2. Yoga by Koliyanda,
3. Light on Yoga by Iyengar,
4. Completed illustrated book of Yoga by Swami Vishnu Devananda,
5. Yoga training manual by Sivananda,
6. Prakriti Chikitsa Yoga by Dr. Jayakumar.

Faculty:

1. Dr. Placid O.I.C. (Ph.D. in Yoga),
2. Rev. Dr. Philip Neri O.I.C., N.D.,
3. Dr. Sr. Sudeepa BNYS,
4. Dr. Tincy BNYS.

Course Coordinators:

Dr. James T. Joseph, Department of Chemistry

Dr. Sonia Mol Joseph, Department of Chemistry

Number of students to be admitted	: 24
Venue	: Silver Jubilee Hall, Mar Ivanios College.
Remuneration to faculty	: Rs. 800/- per hour.
Examination Pattern	
Attendance	: 5marks
Assignment	: 5marks
Performance in classes	: 10 marks
Viva-voce	: 20 marks
Practical Examination	: 60 marks.

Grading Pattern

Percentage of marks	Grade
90 – 100 %	A
75 – 89 %	B
60 – 75 %	C
40 – 60 %	D
Below 40 %	E

3. Karate Training

Syllabus

1. Katthas
2. Attacks
3. Blocks

Duration – 6 months

Time – 3.30 – 4.30 p.m.

Venue – Room No. 121

No. of seats – 25

Faculty

1.Ms.Megha

2. Ms.Lekshmy

4. Communicative Applications in English: AUEN 581.2

No. of credits: 2

No. of instructional hours: 3 per week (Total: 54 hrs)

AIM

1. To help the students attain high level proficiency in all the four language skills.
2. To equip them for competitive examinations and various International English Language Tests.
3. To enhance their career prospects and employability.
4. To help them develop their personality by fine tuning their communication and presentation skills.

OBJECTIVES

On completion of the course, the students should be able to

1. use English for international communication.
2. engage in all kinds of communication activities – informal, formal/business related and academic.
3. perform well in language tests and competitive examinations.

COURSE OUTLINE

Module 1

Listening and Speaking: varieties of modern English – British, American, Indian – basic sounds – deviations in American and other varieties – stress – word – stress and sentence stress – intonation. Verbal Communication: conversation – basic techniques – how to begin, interrupt, hesitate and end – how to express time, age, feelings and emotions – how to respond – using language in various contexts/situations – talking about oneself, others – describing persons, places, incidents, events and objects – attending an interview – addressing an audience – using audio-visual aids – making short speeches – compering – group discussion. Non-verbal Communication: body language : postures – orientation – eye contact – facial expression – dress – posture – self concept – self image – self-esteem – attitudes – values and perception.

Module 2

Reading and Writing -Skimming and scanning – fast reading – writing short messages – e mails – preparing notes and reports based on visuals, graphs and diagrams – letters – informal, formal/official/business related – preparing agenda, minutes – Describing persons, places, incidents and events – writing ads – short argumentative essays. Words often confused and misused – synonyms – antonyms – idioms commonly used – corresponding -American expressions.

Module 3

Writing for Specific Purposes

Scientific writing – business writing – preparation of project proposals – writing of summaries and reviews of movies and books in English/regional languages.

Module 4

Practical Sessions

Language Skills Test (Written)

Teachers could encourage the students at the following tasks:

1. Translation of short and simple passages – from Malayalam to English
2. Providing captions for photos and pictures
3. Symposium – presenting different aspects of a debatable topic.

COURSE MATERIAL

Reading list

1. Mukhopadhyay, Lina et al. Polyskills: A Course in Communication Skills and Life Skills. Foundation,2012.
2. O’Conner, J. D. Better English Pronunciation. CUP.
3. Swan, Michael. Practical English Usage. OUP.
4. Driscoll, Liz. Cambridge: Common Mistakes at Intermediate. CUP.

Reference

Jones, Daniel. English Pronouncing Dictionary, 17th Edn. CUP.

5. Horticulture

Course code :AU BO581.a

Number of credits : 2

Number of contact hours : Lecture: 54 hrs

Module I-10 hrs

1. Introduction
2. Divisions of horticulture
3. Importance and scope of horticulture.
4. Principles of garden making
5. Types of pots and containers
6. Potting mixture and potting media – soil, sand, peat, sphagnum moss.
7. vermiculite
8. Soil types, Soil preparation
9. Irrigation methods
10. Hydroponics

Module II- 12 hrs

I Propagation methods

1. Cuttings
2. Layering – Air layering, Ground layering (Tip, Trench and Compound)
3. Budding – T- budding
4. Grafting – Approach grafting, Bridge grafting, whip and tongue grafting.
5. Garden tools and implements
6. Manures and fertilizers
7. Farmyard manure, compost, vermicompost and biofertilizers.
8. Chemical fertilizers – NPK.
9. Time and application of manures and fertilizers.
10. Foliar sprays

Module III- 12 hrs

1. Components of Garden
2. Lawns and landscaping Trees, shrubs and shrubberies, climbers and creepers
3. Flower beds and borders, ornamental hedges, edges Drives, roads, walks and paths , Carpet beds, topiary,trophy, rockery
4. Conservatory or green houses, Indoor garden, Roof garden
5. Bonsai

Module IV -10 hrs

1. Flower Arrangement
2. Containers and requirements for flower arrangements Free style, Shallow and Mass arrangement
3. Japanese – Ikebana
4. Bouquet and garland making
5. Dry flower arrangement

6. Harvesting Methods, Storage
7. Marketing of Fruits, vegetables and flowers
8. Preservation and processing of fruits and vegetables

Module V -10 hrs

1. Growth regulators in horticulture
2. Rooting hormones , Growth promoters , Flower induction , Parthenocarpy
3. Plant protection Common diseases of fruits and vegetable crops (Mango, Tomato)
4. Weedicides, Fungicides, Pesticides

Field Study: Visit to a Botanical garden under the guidance of the teacher is encouraged.

References

1. Arora J.S 1990, Introductory Ornamental Horticulture, Kalyani Publications
2. Bailey L.H 1901, The Standard Cyclopaedia of Horticulture Volume 1,2 and 3,Macmillan Publications.
3. Bose T.K and Mukerjee D 1987, Gardening in India, Oxford Book House
4. Chauhan V.S, Vegetable Production in India, RamPrasad & Sons
5. Kumar N 1989, Introduction to Horticulture, Rajalakshmi Publications
6. Manibhushan Rao K 1991, Text Book of Horticulture, Macmillan Publications
7. Shujnrnoto, 1982, The Essentials of Bonsai, David & Charles, Newton

6. Human Health and Sex Education-Course Code –AU ZO581.b

No. of credits – 2 Total hours 54

Aim of the course

To redress problem associated with health and sex thereby promoting fitness and well being.

Objectives of the course

- To make the student understand the importance of good health.
- To educate the student on clean sexual habits thereby warding off sexually transmitted diseases.

Module I- 14hrs

Introduction to health: health as a state of wellbeing, health awareness, Immunity immunization and vaccination, factors affecting health- food, balanced diet, food supplements,pathogens, pollution, leep, exercise and stress. Physical health, reproductive health,adolescence, senescence. Mental health- ental illness and disabilities, symptoms and prevention of mental illness; alcoholism, tobacco addiction, de-addiction,lifestyle diseases. Community health- health centres, role of health centres. Spiritual health, yoga and meditation.

Module II -8hrs

Human reproductive system: Male reproductive system- structural details of testis and accessory structures, functions of testis, semen, hormonal control. Female reproductive system structure of ovary, accessory structures, puberty, reproductive cycles and hormonal control,menstrual cycle, gestation period, hysterectomy, menopause.

Module III -7hrs

Events of human reproduction: Gametogenesis- spermatogenesis and oogenesis, ovulation, fertilization, embryonic development, parturition

Module IV 12hrs

Human intervention in reproduction: Contraception and birth control-barrier method,hormonal methods, natural methods, sterilization, termination of pregnancy. Infertility-male and female infertility, causes and treatment for infertility. Assisted Reproductive Techniques- IVF,GIFT, ZIFT, Donor Insemination (DI). Artificial Insemination by Donor (AID), Artificial Insemination by

Husband or partner (AIH). Surrogacy, SUZI (sub-zonal insemination), MIST (micro insemination sperm transfer)

Module V 6hrs

Sexually transmitted diseases: Syphilis, genital warts, chlamydia, chancroid, trichomoniasis, gonorrhoea, genital herpes, AIDS

Module VI 7hrs

Sex education: Adolescent sexual activity, teenage pregnancy, sexual harassment, sexual awareness and policies (legal aspects), lesbian and gay sex, bisexual, transgender youth, adolescent stress management

Suggested topics for assignments / seminars (not for ESE0)

1. A survey of lifestyle diseases in a locality
2. A study on sexually transmitted diseases registered in a hospital
3. A survey of vaccination in village, town and city
4. Impact of yoga and meditation on health
5. A survey of contraceptive methods prevalent among village and city people.
6. A comparison of the effects of sexual harassment among school and college students.
7. A survey of adolescent sexual activities in a city or town.

References

- Common sexual problems and solutions by Dr. Prakash Kothari, UBS Publishers and Distributors Ltd.
- Mac E. Hadley. Endocrinology. Pearson Education, Singapore.
- Taylor, D.J., Green, N.P.O., Stout G. W. Biological Science. (Editor R. Soper) 3rd Edition, Cambridge University Press.
- The Complete Manual of Fitness and Well-being. The Reader's Digest Association, Inc. Pleasantville, New York / Montreal.
- Guyton & Hall. Textbook of Medical Physiology.

7. Writing and Presentation Skills- AUEN 311.4

No. of credits: 4 No. of instructional hours: 5 per week (Total 90 hrs.)

Aims

1. To familiarize students with different modes of general and academic writing.
2. To help them master writing techniques to meet academic and professional needs.
3. To introduce them to the basics of academic presentation
4. To sharpen their accuracy in writing.

Objectives

On completion of the course, the students should be able to

1. understand the mechanism of general and academic writing.
2. recognize the different modes of writing.
3. improve their reference skills, take notes, refer and document data and materials.
4. prepare and present seminar papers and project reports effectively.

Module 1

Writing as a skill – its importance – mechanism of writing – words and sentences - paragraph as a unit of structuring a whole text – combining different sources – functional use of writing – personal, academic and business writing – creative use of writing.

Module 2

Writing process - planning a text – finding materials - drafting – revising – editing - finalizing the draft -computer as an aid – key board skills - word processing - desk top publishing.

Module 3

Writing models – essay - précis - expansion of ideas – dialogue - letter writing – personal letters formal letters - CV – surveys – questionnaire - e-mail – fax - job application - report writing. Academic writing - writing examinations - evaluating a text - note-making- paraphrasing – summary writing - planning a text – organizing paragraphs – introduction – body – conclusion – rereading and rewriting - copy editing - accuracy.

Module 4

Presentation as a skill - elements of presentation strategies – audience – objectives – medium – key ideas - structuring the material - organizing content - audio-visual aids – handouts - use of power point - clarity of presentation - non-verbal communication - seminar paper presentation and discussion.

Course Material-Core reading:

English for Effective Communication. Oxford University Press, 2013.

Reference:

Modules 1 – 3: Write Rightly: A Course for Sharpening Your Writing Skills. (CUP)

Module 4: Guide to Presentations. Mary Munter and Lynn Rusell. Pearson Education

Further reading:

1. Robert, Barraas. Students Must Write. London: Routledge, 2006.
2. Bailey, Stephen. Academic Writing. Routledge, 2006.
3. Hamp-Lyons, Liz, Ben Heasley. Study Writing. 2nd Edition. Cambridge Uty Press, 2008.
4. Ilona, Leki. Academic Writing. CUP, 1998.
5. McCarter, Sam, Norman Whitby. Writing Skills. Macmillan India, 2009.
6. Jay. Effective Presentation. New Delhi: Pearson, 2009.
7. Munter, Mary and Lynn Rusell. Guide to Presentations. Pearson Education.
8. Mayor, Michael, et al, Ed. Longman Dictionary of Contemporary English. 5th Edition. London: Pearson Longman Ltd, 200

8. Fresh Water Aquarium Maintenance and Management

Aim of the course

- To appreciate the prospects and possibilities of ornamental fish production and techniques.
- To gain expertise in aquarium construction and maintenance.
- To familiarise with the rearing and trade of common ornamental fishes and aquatic plants.
- To foster conservation of rare and indigenous species of aquatic fauna and flora by promoting their use in aquaria.
- To develop research mind and a spirit of experimentation in the field.
- To popularise aquarium maintenance as a hobby among common people.
- To make the student aware of the vast potentials involved in ornamental fish farming and trading.
- To gain technical competency to offer services in the setting up and maintenance of aquaria.
- To acquire necessary skills in the area to develop it as an additional source of income.

Objectives of the course

- To learn the scientific method of setting an aquarium
- To learn the culture breeding and marketing techniques of common indigenous ornamental fishes

Unit 1

Design and construction of aquaria: aquarium fabrication- shape, size, volume, type of glass tank, cutting of glass, preparation of glass tank, strengthening and supporting of tank, fitting of tanks into

room settings; aquarium floor setting – type and size of pebbles, gravels, granites used for bed setting and its advantages. Filters- biological, chemical and mechanical. Aquarium accessories like aerators, decorative, lighting, heating and feeding trays.

Unit 2

Water quality management in aquarium systems

Unit 3

Aquarium plants: Uses of aquarium plants, different varieties of plants like submerged plants (tubers, rooted plants, cutting plants) and emerged plants , selection of plants, planting techniques, propagation and maintenance of aquarium plants.

Unit 4

Fresh water ornamental fishes: Common ornamental fishes- indigenous and exotic species; Identification and biology of the common ornamental fishes. *Cyprinus carpio* (koi carp), *Mollisnia sphenops* (black molly lyre tail), *Poecilia reticulata* (guppy), *Poecilia latipinna*, *Xiphophorus helleri* (red sword tail) *Xiphophorus maculatus* (red platy) *Pterophyllum scalare altum* (angel fish) *Carassius auratus* (red oranda) *Betta splendens* (Siamese fighting fish) *Trichogaster leerii* (pearl gourami). Live bearers and egg layers. Sexual dimorphism in ornamental fishes.

Unit 5

Indigenous ornamental fishes - Cyprinids :*Puntius denisonii* (red line torpedo fish),*Puntius fasciatus* (melan barb), *Puntius filamentosus* (Indian tiger barb), *Puntius curmuca* (red tailed silver shark) , *Danio malabaricus* (Malabar danio) ;Loaches (*Nemacheilus triangularis*(Zodiac loach), *Lepidocephalus thermalis* (Malabar loach) ; Cichlids: *Etilia maculatus* (yellow and orange chromides), *E. suratensis* (pearl spot), Anabantids: *Anabas testudineus* (climbing perch)and Catfishes : *Horabagrus brachysoma* (Yellowish catfish), *H. nigricollaris* (White collared imperial catfish).

Unit 6

Breeding and rearing of common ornamental fishes. Conditions for breeding- pH, temperature and sex ratio. Brood stock management- selection of brooders, maintenance and management of brood stocks.

Unit 7

Food and feeding - live feed and formulated feed. Preparation and culture of live feed (*Artemia*, *Infusoria*, *Spirulina*).

Unit 8

Common disease of ornamental aquarium fishes - their causative agents - virus, bacteria, fungi, protozoa and nematode; symptoms, treatment and prophylactic measures. Control of algal growth, snails and other predators.

References

- Arumugam. N. (2008). Aqua culture, Saras publications, Tamil Nadu, India.
- Axelord, H.R. (1967). Breeding aquarium fishes, T F H Publications.
- Dick Mills (1981). Aquarium Fishes, Arco publishing.
- Dick Mills and Gwynne Vevers, (1982). The Practical encyclopedia of fresh water Tropical Aquarium fishes, Salamander Books limited, London.
- Gahlawat, S.K., et.al. (2007). Manual of experimental Ichthyology, Daya publishing House, Delhi.
- Gerhard Brunner, (1973). Aquarium plants, T F H Publications, Inc. Ltd., Hongkong.
- Gupta. S. K. & P. C. Gupta, (2006). General and applied Ichthyology, S. Chand & Co.Ltd., New Delhi.
- Harishankar J. A & A. Biju Kumar, (1997). Aquarium Fishes, B. R. publishing Corporation, Delhi.
- Jorgen Hansen, (1979). Making your own aquarium, Bell and Hyman Ltd., London.
- Ramachandran. A., (2002). Breeding, Farming and management of ornamental fishes.

- School of Industrial Fisheries, Cochin University of Science and Technology, Cochin-16.
- Saroj. K. Swain, (2003). Aquarium care and maintenance, Publ. CIFA, ICAR, Orissa, India.
- Stephen Spotte, (1970). Fish and invertebrate culture, Wiley Inter Science, John Wiley & Sons, Inc., New York.
- Tom Lovell (1998). Nutrition and feeding of fish second Ed. Kluwer Academic publishers.
- Talwar.P.K., and Jhingran.A.G.,(1991). Inland fishes Oxford and IBH Publishing Co. PVT LTD, New Delhi.
- Web site: www. Ornamentalfishes

9. Environmental Studies -AUSD 262

Aim

- To create better understanding about the deteriorating condition of our environment
- among students

Module I:

The Multi-disciplinary Nature of Environmental Studies: Definition, scope and importance, Need for Public Awareness, Ecology and Ecosystems: Definition of Ecology, Structure and function of an ecosystem, Producers, Consumers and Decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids, Introduction, types, characteristics features and function of – forest ecosystem, grassland ecosystem, desert ecosystem, aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries).

Module II:

Biodiversity and its conservation: Introduction, genetic, species and ecosystem diversity definition, value of biodiversity, biodiversity at global, national and local levels, India as a mega diversity nation, hot spots of biodiversity, threats to biodiversity – habitat loss, poaching of wild life, man wild life conflicts, endangered and endemic species of India, conservation of bio diversity in In-situ and EX-situ.

Module III:

Natural Resources: Air resources-features, composition, structure, air quality management, forest resources-, water resources, mineral resources, food resources, energy resources, land resources, Environmental pollution: definition, air pollution, water pollution, marine pollution, thermal pollution, soil pollution, noise pollution, nuclear hazards, waste management, cleaner technologies, reuse and recycling, solid waste management, role of individuals to prevent pollution, pollution case studies, disaster management – floods, earthquake, cyclone and landslides.

Module IV:

Social issues and the environment: From unsustainable to sustainable development, urban problems related to energy, water conservation, rain water harvesting, water shed management, resettlement and rehabilitation of people- it's problems and concerns, case studies, environmental ethics- environmental value relationships, environmental ethics and species preservation, climate change, global warming, acid rain, Ozone layer depletion, nuclear accidents and holocaust, case studies, waste land reclamation, consumerism and waste products, legislation to protect the environment, environmental protection act, air (prevention and control of pollution) act, water (prevention and control of pollution) act, wild life protection act, forest conservation act, environmental management systems (EMS), environmental information systems (EIS), P.I.L public hearing and role of NGOS, ISO 9000 and 14000, issues involved in enforcement of environment legislation, public awareness, environmental economics- environment and standard of living .

References Core:

- Erach Bharucha, Textbook for Environmental Studies (for undergraduate courses of

- all branches of higher education), for University Grants Commission.
- P. Venugopala Rao, Principles of Environmental Science & Engineering, PHI
- Benny Joseph, Environmental Studies, Tata McGraw Hill

Additional References

- Lester R. Brown, Plan B: rescuing a Planet under stress and a civilization in trouble,
- W. W. Norton and Company
- Kurien Joseph & R. Nagendran, Essentials of Environmental Studies, Pearson

10. Food & Dairy Biotechnology-AUBB581.b-Credit 2-Contact hours: 36

Aim and Objective:

This course is for Biotechnology as well as non biotechnology students. Students from other disciplines are also can undergo this course to get basic knowledge in the application of Biotechnology in food processing, food spoilage, food preservation and dairy industry.

Module I 8hrs

Microbes of fermented food- wheat and rice flour, Meat and fish, Breads and bakery products, beverages-wine, beer- Microbiological contamination of foods- indicator organisms, cultural techniques, direct methods, etc.

Module II 10hrs

Food spoilage -Module Microbes involved in food spoilage- Spoilage of Canned foods Meat and dairy products. Conditions of food spoilage- pH, physical structure, chemical composition, oxygen and Temperature -Chemistry of food spoilage-microbial toxins and food poisoning-Food borne diseases and its prevention

Module III 8hrs

Food Preservation- methods of food preservation, Physical & Chemical Methods, Osmotic pressure – preserving foods in sugar and salt, chemical preservatives, Radiation as a preservation methods

Module IV 10hrs

Microbes of Dairy industry- Dairy products, Industrial production of cheese, probiotics and nutrition. Microorganisms as food – fermented food, microalgae- Single cell protein, Edible mushrooms

Textbooks

1. Food Microbiology- MR Adams and Moss
2. Food Processing- Biotechnological applications Marwah & Arora
3. Food Microbiology-William C Frazer
4. Industrial microbiology -LE Casida

11. Apiculture 30hrs

Module IV 8hrs

Introduction and Scope: Definition and significance of the study. Caste system and Social behaviour; common species of honeybees used, organization of bee colony, social life and adaptations of honeybees.

Module V 12hrs

Bee keeping methods and equipments: indigenous methods, extraction appliances, extraction of honey from the comb and processing, management and maintenance of an apiary, bee pastures

Module VI 10hrs

Diseases and economics: diseases (bacterial, fungal, protozoan, acarine, brood diseases), preventive and curative measures. Use of honey, bees wax, bee venom, nutrient profile of honey, marketing strategies.

References

1. Cherian & Ramachandran Bee keeping in South Indian Govt. Press, Madras.

2. Gupta, K.C. Romance of bee keeping. Khadi Paristhan, Calicut.
3. Mishra R.C. Perspectives in Indian Apiculture

12. Creative Writing In English: AUEN 691.1a-No. of credits: 2 -No. of instructional hours: 3 per week (Total: 54 hrs)

Aims

1. To make the students aware of the various aspects of Creative Writing.
2. To expose and familiarise the students to representative English writers and their works.
3. To equip the students to attempt at practical creative writing.
4. To strengthen the creative talents and writing skills.

Objectives

1. To identify different poetic forms.
2. To analyse and appreciate poems and short stories.
3. To write book and film reviews.
4. To appreciate literary works.

Course outline

Module 1

Poetry - introduction: Chief elements: theme, structure, imagery and symbols, rhythm – reference to major poetic forms [with representative/select examples] like lyric, sonnet, ode, ballad, epic, dramatic monologue, and free verse. Practice sessions: critical appreciation of the given poems - emphasis on theme, structure, style, symbols, images, rhythm and diction.

- William Blake - “The Lamb”
- Emily Dickinson – “I Heard a Fly Buzz When I Died”
- Wole Soyinka – “Telephone Conversation”
- Rabindranath Tagore – “Where the Mind is Without Fear”
- Kamala Das – “A Hot Noon in Malabar”

Poetry writing sessions: based on common/everyday themes in various forms – to initiate students into poetry writing.

Module 2

Short Story - introduction: Characteristic features of short stories in general – plot construction, characterization, narration, local colour, atmosphere and title. Short story appreciation: critical appreciation of the given stories and their authors - emphasis on theme, structure, style, images and dialogue.

- Edgar Allan Poe – “The Oval Portrait”
- Chinua Achebe – “The Voter”
- A.C. Doyle - The Adventure of the Speckled Band
- Kushwanth Singh – “The Portrait of my Grandmother”

Short story writing sessions: based on topics/themes - to be given in the class - from everyday life and situations.

Module 3

(a) Writing for Children: Varieties – themes – fantasy - language – imparting values and morals – illustrative examples.

Required reading:

- Lewis Carroll – Alice in Wonderland [Abridged version]
- C.S. Lewis - The Chronicles of Narnia: The Lion, the Witch and the Wardrobe.
- Khyrunnisa A – Howzzat Butterfingers! Puffin Books, 2010.

(b) Science Fiction: Characteristic features – characterization - plot construction – setting – title - impact on films – representative examples: R.L.Stevenson: Dr. Jekyll and Mr. Hyde, H.G. Wells: Time Machine, Jules Verne: 20,000 Leagues Under the Sea.

Module 4

Book and Film reviewing: Elements of book/film reviewing – pertinent questions that a good review must answer – aim/purpose of book and film reviews - sample book/film reviews from newspapers and magazines.

Practice sessions:

Writing book and film reviews - of classics and recently published/released books/films. Books for general reference

1. Abrams, M.H. A Glossary of Literary Terms. Seventh Edition.
2. Prasad, B. A Background to the Study of English Literature. Macmillan.
3. Bernays, Anne and Pamela Painter. What If: Writing Exercises for Fiction Writers. William Morrow & Company, Nov 1991.

13. Environmental Studies -General

Module 1:

Natural resources- Forest resources, water resources, mineral resources, food resources, energy resources, land resources- over exploitation, case studies.

Module 2:

Eco-system- structure and function, producers, consumers and decomposers energy flow in the ecosystem, ecological succession, forest ecosystem, grassland ecosystem, desert ecosystem and aquatic ecosystem. Biodiversity and its value and conservation, hot spots of biodiversity, India as a mega-diversity, nation, endangered and endemic species of India, conservation of bio-diversity. In-situ and Ex-situ conservation of bio-diversity. Sustainable use of forest – water- land -resources – Human population and its impact on environment.

Module 3:

Pollution: air, water, soil and marine, noise, thermal and nuclear hazards. Solid waste management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies. Disaster management. Social issues and the Environment: from unsustainable to sustainable development, water conservation-rain water harvesting; global warming; consumerism and waste products: various acts to protect the environment; Environment protection Act; Air (Prevention and Control of Pollution) Act; Water (Prevention and Control of pollution) Act; Wild Life Protection Act; Forest Conservation Act:

Module 4:

Human population and Environment: Population explosion, Family Welfare Programmes, Environment and human health; human rights, HIV/AIDS, Women and Child Welfare, Role of Information Technology in Environment and Human health. Core text: Green Voices

Books for Reference:

Adams, W.M. Future Nature: A Vision for Conservation. London: Earthscan, 2003.

Arnold, David and Ramachandra Guha, ed. Nature, Culture and Imperialism: Essays on the Environmental

History of South Asia. New Delhi: Oxford UPM 2001.

Bahuguna, Sunderlal. "Environment and Education". The Cultural Dimension of Ecology. Ed. Kapila Vatsyayan. New Delhi: D.K. Printworld. 1998.

Crson, Rachel. Silent Spring. Boston: Houghton Mifflin, 1962.

Guha, Ramachandra- Environmentalism: A Global History, New Delhi: Oxford UP, 2000.

Hayward, Tim. Ecological Thought: An Introduction: Cambridge; polity, 1994.

Merchant, Crolyn. The Death of Nature. New York: Harper, 1990.

Gleick H.P. 1993. Water in Crisis, Pacific Institute for Studies in development Environment and security. Stockholm Env Institute. OUP 473 p

14. Listening & Speaking Skill

General Objectives

The general objective of the course is to make the students proficient communicators in English. It aims to develop in the learners the ability to understand English in a wide range of contexts. The main thrust is on understanding the nuances of listening, speaking and reading English. The course is a step towards preparing the learners to face situations with confidence and to seek employment in the modern globalized world. As knowledge of English phonetics will help the students to listen and to speak English better, they would be given rudimentary training in English phonetics. It also enhances the student's general standard of spoken English. The knowledge of the phonetic alphabets/symbols will help the students to refer the dictionary for correct pronunciation.

Module I Listening

Introduction, definition of listening, listening Vs hearing, process of listening, problems students face in listening, sub-skills of listening, what is good listening? strategies of listening, barriers to listening, listening in the workplace, activities that help you to become better listeners.

Module II Speaking

English, the lingua franca, varieties of English; Indian English, Received Pronunciation, Why phonetics? Organs of speech and speech mechanism; Classification of English sounds- vowels; consonants; IPA symbols, transcription, the syllable, syllable structure, stress and intonation, some rules of pronunciation, Indian English and deviations from RP, Speaking as a skill; speaking on formal and informal occasions; how to perform a wide range of language functions such as greeting, thanking, complaining, apologizing.

References

- Marks Jonathan. English Pronunciation in Use. New Delhi: CUP, 2007.
- Lynch, Tony. Study Listening. New Delhi. CUP, 2008.
- Kenneth, Anderson, Tony Lynch, Joan Mac Lean. Study Speaking. New Delhi: CUP, 2009

15. Bioinformatics

Introduction

Introduction to bioinformatics, brief history, goal, scope, applications and limitations of Bioinformatics. Data bases --Data bases: Biological databases - primary, secondary and specialized data bases; pitfalls of biological data bases. Information retrieval from biological data bases - Entrez, GenBank, FASTA, BLAST -Sequence Alignment- Pairwise sequence alignment, evolutionary basis of sequence alignment, methods of sequence alignment, dot matrix method, dynamic programming method, scoring matrices - Palm and BLOSUM; Multiple sequence alignment.

Phylogenetic trees–Construction of rooted and un-rooted phylogenetic trees, their interpretation and use in analyzing evolutionary trends, steps in phylogenetic analyses.

Computational biology-Brief overview of computational biology, computation, prediction and modulation of biological pathways, (ex. Kegg pathways) e-cell, computational analyses of genomes and proteomes.

References

- Ernster, L. (Ed.). 1985. Bioenergetics. Elsevier, New York
- Ghatak K.L. 2011. Techniques and Methods in Biology. PHI Learning Pvt. Ltd. New Delhi
- Gupta A. 2009. Instrumentation and Bio-Analytical Techniques. PragatiPrakashan, Meerut.

16. Galileo Ticketing Package Course

Software application with Galileo:

Booking: Sign In/off, Work Areas, Displaying City codes, Airline Codes, Decoding, Seat Booking, Basic flight Availability, Creating PNRs, Entering name segment, itinerary, contact, Ticket Element, Billing address, special requests, and other information.

Changing the PNR Elements; Deleting basic PNR Data, Cancelling mandatory elements, Rebooking, Advance seating request.

Itinerary Pricing; Displaying of Fares, booking tickets, rebooking of tickets, Issuing electronic tickets and paper tickets, queue, Mandatory queue, Removing a PNR from queue, Placing PNR in delay queue .

Reference:

1. Sheldon P. (2002), Tourism Information Technology, CABI.
2. Inkpen G. (2000), Information technology for Travel and Tourism, Addison Wesley.
3. Buhalis D. (2004), Etourism: Information Technology for Strategic Tourism Management, Prentice Hall India.
4. Poon A. (1998), Tourism, Technology and Competitive Strategies, CABI.
5. Rayport J.F. & Jaworski B.J. (2002), Introduction to Ecommerce, McGraw-Hill.
6. Malvino A.P (1995), Electronic Principles, McGraw-Hill.
7. Galileo —Global Distribution System

17. Sewing Class For Lady Students

Module 1-

Familiarizing the sewing machine and its parts – peddle, wheel, needle, bobbin, thread, belt etc.

How to do the following things

- Thread the sewing machine properly
- Adjust thread tension
- Wind the bobbin
- Change machine feet
- Dial for different stitches

Module 2

Reading tape measures, take body measurements

Module3

Cutting according to measurements, button hole, fixing buttons, zippers etc. Straight stitch, reverse stitching, zigzag stitching etc. Petticott making, churidhar -bottom and top of varied design. Blouse stitching- cholly-old and new types

18. Health and Fitness Education

Module:1

Introduction to Health and Physical Education, Concepts of Health & Physical Education
Definition and Meaning of Health. Dimension of Health [Physical, Mental, Social, Spiritual and Emotional] Definition, Meaning, Objectives and Importance of Physical Education.
Factors Affecting Health - Biological, Personal, Environmental, & Socio-cultural factors.
Impact of Alcohol, Tobacco and Drugs. Over use of Television, Computer and Mobile Phones.
Hypo Kinetic Diseases and their common Causes (Diabetes, Obesity & Hypertension)

Module:2.

Scientific Basis of Physical Activity, Heart Rate, Blood Pressure & Body Mass Index. Types of Exercises -- Isotonic and Isometric exercise, Aerobic & Anaerobic Exercises. Benefits of Exercises
Effects of Exercises on the following system of the body - Circulatory and Respiratory System, Warm-up, Cool-down, Oxygen Debt & Second wind. Types of Fitness - Health Related Fitness (Cardio respiratory Fitness, Muscular Strength, Muscular Endurance, Flexibility and Body Composition) Skill/Performance Related Fitness (Speed, Strength, Coordinative Abilities, Power, Endurance & Agility)

Module:3.

Meaning of Wellness & Methods of Improving Wellness , Hygiene , Personal, Environment and Occupational Hygiene . Need and Importance of Recreation for healthy living

Module:4.

Posture and First Aid - Nutrition and balanced diet , Importance of Correct Posture
Common Postural Deformities, Causes and their Remedial Measures , Kyphosis, Lordosis, Scoliosis, Knock-Knee, Bow Legs & Flat Foot . First Aid and Principles of First Aid . First Aid measures for the following - Bleeding through Nose, Snake bite, Dog bite, Electric shock, Burns & Drowning , Common injuries and their Management , Wounds, Cuts, Sprain, Fractures & Dislocation

Module:5.

Introduction to Sports and Games, Olympic Games, Asian Games and National Games , National Tournaments (Santhosh Trophy, Ranji Trophy & National Sports Awards , Dronacharya, Khel Ratna & Arjuna Awards
Media and Sports , Women and Sports , Doping in Sports GST Certification Course – Mar Ivanios College

19. Goods and Service Tax Certification course

A course jointly conducted by Ivanios College and Vital Source Knowledge Associates P.Ltd., [VKA], a Delhi based Knowledge management and professional services Company, to give budding professionals a competitive edge and gain insights and consider the option of updating taxation knowledge and becoming a GST Professional. The professional faculty comprises of practitioners who are passionate about sharing their knowledge and experience for mentoring Ivanios college M.Com students, who are at the threshold of their career.

Course Highlights:

GST Course conveniently phased in tandem with your college M.Com sessions 25- 30 hours of focused study including some practical exposure sessions .Course conducted by practicing

professionals aimed to complement academic learning, Interactive GST Query resolution sessions for students and invitees Multiple choice/FAQ test to evaluate your performance. GST Course Certificate jointly issued by Ivanios College and VitalSource Knowledge Associates P.Ltd (refer: www.vitalsource.com) , Subject to approval of Ivanios college management, successful candidates will have preference in trainee/regular placements in VKA Group entities and with clients. They will also be granted free access to the Group's placement services based on their career choices.

Vacancies exist presently in the Group and interested students may kindly contact CA George Kurian personally as convenient, or call at 9971450851 or send Email: gak.virtuedge@gmail.com

Our GST Certification Course Faculty -CA George A. Kurian, is a Chartered Accountant in practice, a Fellow member who has served in senior managerial positions with globally leading firms [PwC and RSM] and trained hundreds of students and professionals across his career spanning over 3 decades in India and the Middle East.

CA Ravishankar R, is a young Chartered Accountant with a decade in the profession.

Course Duration

One and half Months Detailed GST Course, tentatively on following days [unless rescheduling agreed by mutual understanding and duly communicated]. Batch days and timing as follows:

Tuesday, Wednesday and Thursday – 1 hour 15 minutes duration each [75 mins], and Saturday -3 hours each [180 minutes] with a 15 minute break in between sessions, Batch time may be 9 A.M to 12 noon, or 10 A.M to 1 P.M.

Total 25 sessions out of which 4-5 practical sessions on use of GST portal.

PPT Presentation and FAQs shall be provided by mail for all the sessions. The session wise coverage shall be mailed after registration.

Mode of Communication

The Online GST Certification Course shall be in English [with some mix of Malayalam] as students are presumed to be conversant with both languages.

Career benefits for students successfully completing the course:

- Preferential weightage in being appointed as Consultant Trainees/Executives for GST, GCC VAT and compliance services of VKA and group entities, for students who successfully complete the course.
- Students interested in pursuing CA course [or CA Accounting Technician – 1 year course] after their M.Com, will be provided mandatory articleship training with our CA firm George A.Kurian & Co., for improving their career prospects if they meet the qualification criteria.
- Placement assistance will be provided to GST batch students.

Batch Schedule

<i>Sessions</i>	<i>Topics</i>
Introductory Session ethical considerations	Overview of GST, impact on career and
Session 1	Important Definitions
Session 2	Levy of GST and collection
Session 3	Purpose, Time and Place of Supply
Session 4	Registration, transition provisions and
Cancellation	
Session 5	Input Tax Credit and Input Service
Distributor [ISD]	
Session 6	Valuation

Session 7	Classification under HSN
Session 8	Exempt list of services
Session 9	Reverse charge
Session 10	Return Filing Procedures [incl. Live demonstration through GSTN]
Session 11	Maintenance of Records and Books
Session 12	Payment of Tax [Electronic cash & credit ledgers, challans, off set]
Session 13	Refund under GST
Session 14	Advance ruling under Chapter XII
Session 15	Overview of Audit
Session 16	Assessment, Inspection, Search & Seizure, Appeals and Revision
Session 17	Industry specific considerations
Session 18	Major changes at GST Council Meeting and Miscellaneous topics.

20. Refresher programme in molecular biology Techniques-

LIPID estimation (Folch et al., 1957)

Alcohol: ether (3:1 v/v)

Chloroform: methanol (1:1 v/v)

200 mg tissue with 3:1 alcohol –ether into 15 ml at 65oC for 2 hrs,

Centrifuged for 30 min

-6 ml alcohol – ether added to residue , heated 2 hr at 65 oC

Centrifuged and decanted.

-6 ml 1:1 chloroform-methanol 65 oC

-Supernatant pooled and made upto 25 ml with chloroform methanol,

Lipid estimation (Fringe & Dunn (1970)

-conc. H₂SO₄

-vanillin 0.6%

-phospho-vanillin

200 ml 0.6% vanillin in 800 ml conc. Phosphoric acid-

Std. Olive oil stock 1% in ethanol

-working std. 400 mg % in ethanol

Estimation:

0.1 ml tissue extract

+

2 ml con. H₂SO₄

Incubated to boil in Water Bath for 10 min.

Cooled and pipetted digested mixture 0.1 ml to another test tube +

0.1 ml conc. H₂SO₄ + 5 ml phospho–vanillin reagent

Incubate at 37oC for 15 min , OD reading at 540 nm.

Reference:

1Fringe, C S & Dunn R (1970). A colorimetric method of determination of total lipid based on sulphophosphate-vanillin reaction. Am. J. of Clin. Pathol 4: 53-89.

2. Folch J, Lees M, Sloane-stanley GH (1957). A simple method for the isolation and purification of total lipid from animal tissues. *J. Biol. Chem.* 226: 497-509.

Estimation of Protein By Lowry's Method

Introduction Proteins are polymers of amino acids which are linked to each other through linkages called peptide bonds. The backbone of protein is made of –CO-NH- linkage named as peptide linkage and this is common to all proteins. The properties of protein in general sense are governed by various R-group of different amino acids. The structure of protein varies according to the arrangement of sequences of amino acids. These are primary, secondary, tertiary and quaternary structure for protein. Proteins can be estimated by different methods as described by Lowry and also by estimating the total nitrogen content. No method is 100 % sensitive. Hydrolysing the protein and estimating the amino acids alone will give the exact quantification. The method developed by Lowry's et al is sensitive enough to give a moderately constant value and hence largely followed. Protein content of enzyme extracts is usually determined by this method.

Aim:

Estimating the amount of protein in the sample of tissue extract or blood serum.

Principle:

Protein and peptide reacts with alkaline copper tartrate solution to give a violet coloured complex. The intensity of the colour complex is measured colorimetrically at 620 nm and is proportional to the concentration of total protein in the specimen under test. The reagent must be prepared carefully because alkalinity affects colour development. The blue colour developed by reduction of phosphomolybdic phosphotungstic acid is the Folin-Ciocalteu (Folin-phenol) reagent by the amino acid tyrosine and tryptophan present in the protein and the colour developed by the biuret reaction of the protein with alkaline cupric tartrate are measured in the Lowry's method.

Reagents:

1. Reagent A: - 2% sodium carbonate in 0.1 N NaOH . (Dissolve 2 gms of NaOH in 500 ml of distilled water. To this solution add 10 gms of Na₂CO₃ and mix thoroughly.)

2. Reagent B: 0.5% CuSO₄.5H₂O in 1% Potassium sodium tartrate (Rochelle salt). (dissolve 1 gm Pot. sod. tartrate in 100 ml distilled water and to this add 500 mg Copper Sulphate.

3. Reagent C: Mix 50 ml of Reagent –A and 1 ml of Reagent-B just before use (do not keep it over 1 hr).

4. Reagent D: Folin-Ciocalteu Reagent or Folin-phenol reagent for protein (diluted the commercial reagent with an equal volume of distilled water at the time of estimation (1 ml :1 ml)).

[Preparation: Reflux gently for 10 hours a mixture consisting of 100 gm sodium tungstate, 25 gm sodium molybdate, 700 ml distilled water, 50 ml of 85% phosphoric acid and 100 ml concentrated hydrochloric acid in 1.5 L flask. Add 150 gm lithium sulfate, 50 ml water and a few drops of bromine water. Boil the mixture for 15 min without condenser to remove excess bromine. Cool, dilute to 1 L and filter. The reagent should not have greenish tint. – determine the acid concentration of the reagent by titration with 1 N NaOH to a phenolphthalein end-point.]

5. Standard Protein: (stock) (BSA-bovine serum fraction iv). 0.1%. Dissolve 100 mg BSA in 100 ml distilled water. (Dissolve the BSA flakes in small quantity of water with gentle swirling in a beaker, transfer to standard flask and make up to 100 ml. Avoid shaking that result in frothing and affect the concentration).

Working standards of BSA: Prepare 100 µg, 200 µg, 400 µg, 600 µg, 800 µg and 1000 µg per ml concentrations .

<i>Stock soln.</i> <i>ml</i>	<i>Distilled water</i> <i>Concentrations</i>	<i>Final vol</i>
1 ml		
2 ml		
4 ml		
6 ml		
8 ml		
10 ml	9 ml	
8 ml		
6 ml		
4 ml		
2 ml		
-	10	
10		
10		
10		
10		
10	100 µg	
200 µg		
400 µg		
600 µg		
800 µg		
1000 µg		

Procedure:

Blood serum was collected from a clinical laboratory. Pipetted 0.1 ml serum into a clean dry labeled test tube and made this to 1 ml with DW. 1 ml volumes of different working stands of BSA were pipetted into test tubes labeled respectively. 1 ml DW was taken in a blank tube. Added 5 ml Reagent C to each of the test tubes, mixed well and incubated in room temperature for 10 minutes. Added 0.5 ml of diluted Folin-phenol reagent in each test tube. After thorough mixing the tubes were incubated in dark at room temperature for 30 minutes. A blue colour developed was measured as optical density in a sensitive colorimetre at 620 nm wavelength.

Result: Concentration of blood serum gave a value.....mg/dl

Concentration of tissue protein was%

Discussion:

Blood plasma consists of 90 to 92 % water and 7 – 8 % proteins. There are four types of plasma proteins; they are serum albumin, serum globulin and fibrinogen. Serum protein analysis is having a diagnostic function, it can identify liver disorders, nutritional deficiencies, renal failures etc.. The normal value of serum protein in adult is 6 – 8 mg/dl. Decrease in total protein value is associated with liver cirrhosis and other disorders like nephritic syndrome and neoplastic disorders. Increase in value may found in multiple myeloma.

Reference:

Lowry, O H., Rosebrough, N J., Farr, A L. and Randall, R J 1951 J Biol Chem 193; 265.

An Introduction to Practical Biochemistry by David T Plummer; Tata McGrow-Hill, New Delhi

Estimation of DNA in the tissue (liver/spleen)

Principle:

The amount of the DNA vary from one tissues to another, in some it is practically inconvenient to get sufficient sample. In addition some tissues contain high DNase activity sothat the DNA is broken

down into smaller fragments. A convenient source for isolation of DNA should therefore contain a high quantity of material and low DNase activity. Lymphoid tissue, spleen and thymus are thus the best sources for DNA extraction. Sodium citrate bind with Ca^{++} and Mg^{++} which are the cofactors for DNase and prevent much loss of DNA during extraction.

When DNA is treated with diphenylamine under acidic conditions, a blue compound is formed with a sharp absorption maximum at 595 nm. This reaction is due to 2-deoxypentose in general and is not specific for DNA. In acid solution, the straight chain form of a deoxypentose is converted to the highly reactive β -hydroxylevulinialdehyde which reacts with diphenylamine to give a blue complex. In DNA, only the deoxyribose of purine nucleotide reacts, so that the value obtained represents half of the total deoxyribose present.

Reagents & Requirements:

1) DNA standards (calf thymus DNA; commercial sample).

Stock soln. Dissolve 100 mg calf thymus DNA in 100 ml buffered saline.

Working standards:

2 ml diluted to 20 ml with b. saline(0.1 mg/ml);

4 ml ,, 20 ,, ,, (0.2 mg/ml)

8 ml ,, 20 ,, ,, (0.4 mg/ml).

12 ml ,, 20 ,, ,, (0.6 mg/ml)

16 ml ,, 20 ,, ,, (0.8 mg/ml).

20 ml (stock) – (1 mg/ml).

2)Buffered saline (0.15 M NaCl; 0.015 M sodium citrate at pH 7): 4.4 gm NaCl and 2.2 gm sodium citrate dissolved in 500 ml adjusting the pH at 7.

3)Diphenylamine reagent (freshly prepared) (1%) : Dissolve 1 gm diphenylamine in 100 ml glacial acetic acid and add 2.5 ml conc. Sulphuric acid.

4)Boiling water bath.

5)Extraction reagents: a)10 % ice cold TCA;

b)ethanol:ether (1:1);

c) 0.5 N Na OH;

d) Perchloric acid.

6)Spectrophotometer / Colorimeter.

Procedure:

Extraction of DNA from tissue (liver/spleen/thymus).

1.Homogenize 100 mg wet tissue (liver) in 2 ml of buffered saline.

2.Collect the homogenate in a clean centrifuge tube. Add double volume (4 ml) of 10 % ice cold TCA.

3.Centrifuge at 3000 rpm for 10 min., discard supernatant and collect the precipitate.

4.Resuspend the ppt. in 5 ml ice cold TCA, centrifuge at 3000 rpm for 10 min. discard the supernatant.

5.Suspend the ppt. in 5 ml ethanol:ether (1:1); centrifuge at 3000 rpm for 10 min, discard the supernatant.

6. Suspend the ppt. in 5 ml 0.5 N NaOH and incubate at 37o C for 18 hrs.

7 Centrifuge at 3000 rpm for 10 min. Remove the supernatant containing RNA (for RNA estimation).

8 Add 2 ml perchloric acid to the centrifuge tube containing nucleoprotein ppt., heat in a boiling water bath for 30 min to 50 min.

9.Cool and centrifuge at 3000 rpm for 10 min. Collect the supernatant for DNA estimation (make up to 2 ml with perchloric acid).

Estimation of DNA:

10 Aliquots of supernatant (1 ml) is pipetted into clean dry test tubes and make upto 2 ml with buffered saline.

11. Simultaneously pipette 2 mls of working standards in labeled test tubes respectively (represent 0.2, 0.4, 0.8, 1.2, 1.6 & 2 mg DNA); 2 ml b: saline taken in a test tube marked as blank.

12. Add 4 ml freshly prepared DPA in each of test tubes.

13. Heat in a boiling water bath for 10 min (marble beads to be used as lid).

14. Cool and read the extinction at 595 nm.

Observations

<i>Sl No.</i>	<i>Samples</i>	<i>Absorbance (Od) at 595 nm</i>
1	Std DNA (0.2 mg)/2ml	
2	„ (0.4 mg)/2ml	
3	„ (0.8 mg)/2ml	
4	„ (1.2 mg)/2ml	
5	„ (1.6 mg)/2ml	
6	„ (2 mg)/2ml	
7	Extracted tissue DNA	
	(unknown concentration)	

Calculation:

A standard curve is constructed plotting the OD of standards in Y axis and concentrations in X axis. The DNA concentration of the tissue extract is determined against the plotted OD.

Alternately the tissue DNA is also

calculated using a single standard slon as below:

Concentration of tissue

extracted DNA = Concentration of standard x OD of the unknown sample

OD of the standard

$$= \dots \text{ mg in aliquots (1 ml)} \times 2 =$$

....mg/100 mg wet tissue

$$= \dots \% \text{ of wet tissue}$$

(Note: 2 is the dilution factor since 1 ml aliquots out of 2 ml digest was used in estimation)

Reference: 1. An introduction to practical biochemistry, David T Plummer. Tata McGraw Hill.

2. Biochemical methods for Agricultural Sciences, S. Sadasivam & A. Mannikkam. Wiely Eastern Ltd., & TNAU How to prepare 1 M sodium phosphate buffer having a pH of 8.0 ?

Monobasic sodium phosphate (Na H₂PO₄) in water exist as Na⁺ and H₂PO₄⁻ ions.

H₂PO₄⁻ (Phosphoric acid, the conjugate acid) dissociate further to HPO₄²⁻ (the conjugate base) and H⁺ and has a pKa value of 6.82 at 25o C.

$$\begin{aligned} \text{pH} &= \text{pKa} + \log \frac{[\text{A}^-]}{[\text{HA}^-]} \\ 8.0 &= 6.82 + \log \frac{[\text{HPO}_4^{2-}]}{[\text{H}_2\text{PO}_4^-]} \\ 1.18 &= \log \frac{[\text{HPO}_4^{2-}]}{[\text{H}_2\text{PO}_4^-]} \\ \text{Antilog } 1.18 &= \frac{[\text{HPO}_4^{2-}]}{[\text{H}_2\text{PO}_4^-]} \\ &= 15.14 \end{aligned}$$

therefore, the ratio of HPO₄²⁻ to H₂PO₄⁻ is equal to 15.14

To make 1 M sodium phosphate buffer, 15.14 parts of Na₂HPO₄ should be combined with 1 part of NaH₂PO₄ ;

adding 15.14 parts of Na₂HPO₄ & 1 part NaH₂PO₄ gives a total value of 16.14 parts.

The amount of each conjugated acid and conjugated base to combine to make 2 L of the desired buffer is then:

For Na₂HPO₄ , the amount is equal to $(15.14/16.14) \times 2 \text{ L} = 1.1876 \text{ L}$

For NaH₂PO₄ , the amount is equal to $(1/16.14) \times 2 \text{ L} = 0.124 \text{ L}$

when two volumes are combined, you will have 1 M sodium phosphate buffer having a pH of 8.0

21. Certificate Course In Tamil Language And Literature - Hours :40

Aims / Objectives:

To acquire a Knowledge to comprehend and express in Tamil

Course Description -This CERTIFICATE COURSE paper is for the students of non Tamil. They can opt this course for studying Tamil language and literature from basic level. In this class Tamil language is taught as speaking , Reading and Writing level.

Course Content

Module I.

Exercises and drills in the spoken and written variety- Text book

1.Rajaram S. 1987 An Insensitive course in Tamil, Central Institute of Indian Languages, Mysore .(with Audio Cassetts)

2.Sankaranarayanan S.1994 A Programmed Courses in Tamil , Tamil – An Auto Instructional Course (Or) Deivasundram N Gopal A 1984 Tamil An Auto Instructional Course Text International Institute of Tamil studies, Chennai (with Six ,audio cassettes)

3.Jeans Lawrence, S & Ranganathan D. 1988, Hand book of Tamil – An Auto Instructional Course,

4.Jeans Lawrence S.1996, Tamil An Auto Instructional Course , Work Book Written Tamil Or Subramoniam V.I and Veeraswamy T.V 1973, Intensive Course in Tamil, Dravidian Linguistics Association, Trivandrum.

Module 2.

Study of selected prose and poetry (in the form of a Reader)

The Reader may be compiled by the instructor. It shall include modern prose narratives such as short stories, passages from novel, essay, and short poetry pieces etc.

Module 3.

Study of the History of Tamil literature through ages:

1.A History of Tamil Literature, Dr .Mu Varadarajan (Malayalam Translation) sahitya Akademi.

2 A History of Tamil Literature, Dr T.P. Meenakshi sundaram (Malayalam Transalation) State Institute of Language, Thiruvananthapuram.

3.Tamil sahityam ,Dr K.M.George ,Kerala Sahitya Academi, Trissur, 1977

Module 4 .

Exercises in transalation from Tamil to Malayalam/ English and Malayalam / English to Tamil

Scheme of Examination: Oral and Written

The oral examination may be made part of the Continuous Assesment.

For the Written Examinations Maximum marks shall be 60 marks pattern of questions shall be as follows;

Module 1. Exercises and drills in the spoken and Written Variety-

Objectives type questions based on Text books including grammar

Short answer types questions based on Text books 3 out of (3x3)

Module 2. Study of Selected prose and poetry (in the form of a Reader)

objectives type questions based on Reader

Short answer type questions based on the Reader (annotations etc) (50 word each)

Module 3. Study of the History of Tamil literature through ages:

Objective type questions based on History of Literature –(6questions)

Short answer question based on History of Literature (50 words each) 3 out of 5 (3x3)

Module 4. Exercises in translation from Tamil to Malayalam/English and Malayalam/

English to Tamil

Translation from Tamil to Malayalam /English (50words)

Translation from Malayalam /English to Tamil (50 words)

Attendance / Participation-

5

Assignments-

10

(Total

10

Assignments)

Class Test -

10

Mid Semester

15

END SEMESTER

-

60

22. Aquaculture:

Aquaculture :

Definition, perspective to Indian scenario, Important culture fishes. Traditional methods of aquaculture, fishing crafts and gears, common fishes used for culture in Kerala, Catla, Etroplus, Tilapia and Mugil; capture fishes- sardine, mackerel.

Pond culture :

Construction, maintenance and management of ponds . carp culture, shrimp culture, shellfish culture, composite fish culture and pearl culture

Mariculture :

Utilization of coastal waters for rearing marine, economically important edible fishes.

HAPAS-

Types of hapa, construction of hapas. Uses. Recent trends in mariculture.

Brackish water aquaculture-

prerequisites, Benefits, food supply sustainability.

Ornamental fish culture: Fresh water ornamental fishes – biology, breeding habits, spawning, hatching and rearing , techniques. Construction and maintenance of aquarium: Construction of home aquarium, materials used, setting up of freshwater aquaria, aquarium plants, ornamental objects, cleaning the aquarium, maintenance of water quality, control of snail and algal growth

23. CIVIL SERVICE –

Prelims Syllabus

Syllabus of Paper I (200 marks) Duration : 2 hours

- Current events of national and international importance
- History of India and Indian National Movement
- Indian and World Geography - Physical, Social, Economic Geography of India and the World

- Indian Polity and Governance - Constitution, Political System, Panchayati Raj, Public Policy, Rights Issues, etc
- Economic and Social Development - Sustainable Development, Poverty, Inclusion, Demographics, Social Sector initiatives, etc
- General issues on Environmental Ecology, Bio-diversity and Climate Change - that do not require subject specialisation General Science

Syllabus for Paper II-(200 marks) Duration: 2 hours

- Comprehension
- Interpersonal skills including communication skills;
- Logical reasoning and analytical ability
- Decision-making and problem solving
- General mental ability
- Basic numeracy (numbers and their relations, orders of magnitude, etc.) (Class X level), Data interpretation (charts, graphs, tables, data sufficiency etc. - Class X level)

Civil Service : Mains Exam

Syllabus

Essay Paper

Essay - 250 Marks - To be written in the medium or language of the candidate's choice. Candidate is required to write an essay on a specific topic. The choice of subjects will be given. They are expected to keep their thoughts closely to the subject and arrange their ideas in orderly fashion and be concise. Credit will be given to effective and coherent expression.

Paper-I

General Studies-I

250 Marks (Indian Heritage and Culture, History and Geography of the World and Society)

1. Indian culture will cover the salient aspects of Art Forms, Literature and Architecture from ancient to modern times.
2. Modern Indian history from about the middle of the eighteenth century until the present- significant events, personalities, issues
3. The Freedom Struggle - its various stages and important contributors /contributions from different parts of the country.
4. Post-independence consolidation and reorganization within the country.
5. History of the world will include events from 18th century such as industrial revolution, world wars, redrawing of national boundaries, colonization, decolonization, political philosophies like communism, capitalism, socialism etc.- their forms and effect on the society.
6. Salient features of Indian Society, Diversity of India.
7. Role of women and women's organization, population and associated issues, poverty and developmental issues, urbanization, their problems and their remedies.
8. Effects of globalization on Indian society
9. Social empowerment, communalism, regionalism & secularism.
10. Salient features of world's physical geography.
11. Distribution of key natural resources across the world (including South Asia and the Indian sub-continent); factors responsible for the location of primary, secondary, and tertiary sector industries in various parts of the world (including India)
12. Important Geophysical phenomena such as earthquakes, Tsunami, Volcanic activity, cyclone etc., geographical features and their location- changes in critical geographical features (including water-bodies and ice-caps) and in flora and fauna and the effects of such changes.

Paper-II

General Studies -II:

250 Marks (Governance, Constitution, Polity, Social Justice and International relations)

13. Indian Constitution- historical underpinnings, evolution, features, amendments, significant provisions and basic structure.
14. Functions and responsibilities of the Union and the States, issues and challenges pertaining to the federal structure, devolution of powers and finances up to local levels and challenges therein.
15. Separation of powers between various organs dispute redressal mechanisms and institutions.
16. Comparison of the Indian constitutional scheme with that of other countries
17. Parliament and State Legislatures - structure, functioning, conduct of business, powers & privileges and issues arising out of these.
18. Structure, organization and functioning of the Executive and the Judiciary Ministries and Departments of the Government; pressure groups and formal/informal associations and their role in the Polity.
19. Salient features of the Representation of People's Act.
20. Appointment to various Constitutional posts, powers, functions and responsibilities of various Constitutional Bodies.
21. Statutory, regulatory and various quasi-judicial bodies
22. Government policies and interventions for development in various sectors and issues arising out of their design and implementation.
23. Development processes and the development industry the role of NGOs, SHGs, various groups and associations, donors, charities, institutional and other stakeholders
24. Welfare schemes for vulnerable sections of the population by the Centre and States and the performance of these schemes; mechanisms, laws, institutions and bodies constituted for the protection and betterment of these vulnerable sections
25. Issues relating to development and management of Social Sector/Services relating to Health, Education, Human Resources.
26. Issues relating to development and management of Social Sector/Services relating to Health, Education, Human Resources, issues relating to poverty and hunger.
27. Important aspects of governance, transparency and accountability, e-governance- applications, models, successes, limitations, and potential; citizens charters, transparency & accountability and institutional and other measures.
28. Role of civil services in a democracy.
29. India and its neighbourhood- relations.
30. Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests
31. Effect of policies and politics of developed and developing countries on India's interests, Indian diaspora.
32. Important International institutions, agencies and fora, their structure, mandate.

Paper-III -General Studies -III 250 Marks

(Technology, Economic Development, Bio-diversity, Environment, Security and Disaster Management)

33. Indian Economy and issues relating to planning, mobilization of resources, growth, development and employment.
34. Inclusive growth and issues arising from it.
35. Government Budgeting.
36. Major crops cropping patterns in various parts of the country, different types of irrigation and irrigation systems storage, transport and marketing of agricultural produce and issues and related constraints; eg technology in the aid of farmers

37. Issues related to direct and indirect farm subsidies and minimum support prices; Public Distribution System .objectives, functioning, limitations, revamping; issues of buffer stocks and food security; Technology missions; economics of animal-rearing.
38. Food processing and related industries in India- scope and significance, location, upstream and downstream requirements, supply chain management.
39. Land reforms in India.
40. Effects of liberalization on the economy, changes in industrial policy and their effects on industrial growth.
41. Infrastructure: Energy, Ports, Roads, Airports, Railways etc.
42. Investment models.
43. Science and Technology- developments and their applications and effects in everyday life
44. Achievements of Indians in science & technology; indigenization of technology and developing new technology.
45. Awareness in the fields of IT, Space, Computers, robotics, nano-technology, bio-technology and issues relating to intellectual property rights.
46. Conservation, environmental pollution and degradation, environmental impact assessment
47. Disaster and disaster management.
48. Linkages between development and spread of extremism.
49. Role of external state and non-state actors in creating challenges to internal security.
50. Challenges to internal security through communication networks, role of media and social networking sites in internal security challenges, basics of cyber security; money laundering and its prevention
51. Security challenges and their management in border areas ; linkages of organized crime with terrorism
52. Various Security forces and agencies and their mandate

Paper-IV

General Studies -IV 250 Marks

(Ethics, Integrity and Aptitude) This paper will include questions to test the candidates' attitude and approach to issues relating to integrity, probity in public life and his problem solving approach to various issues and conflicts faced by him in dealing with society. Questions may utilise the case study approach to determine these aspects. The following broad areas will be covered.

53. Ethics and Human Interface: Essence, determinants and consequences of Ethics in human actions; dimensions of ethics; ethics in private and public relationships. Human Values - lessons from the lives and teachings of great leaders, reformers and administrators; role of family, society and educational institutions in inculcating values.
54. Attitude: content, structure, function; its influence and relation with thought and behavior; moral and political attitudes; social influence and persuasion.
55. Aptitude and foundational values for Civil Service , integrity, impartiality and non-partisanship, objectivity, dedication to public service, empathy, tolerance and compassion towards the weaker-sections.
56. Emotional intelligence-concepts, and their utilities and application in administration and governance.
57. Contributions of moral thinkers and philosophers from India and world.
58. Public/Civil service values and Ethics in Public administration: Status and problems; ethical concerns and dilemmas in government and private institutions; laws, rules, regulations and conscience as sources of ethical guidance; accountability and ethical governance; strengthening of ethical and moral values in governance; ethical issues in international relations and funding; corporate governance.

59.Probity in Governance: Concept of public service;Philosophical basis of governance and probity; Information sharing and transparency in government, Right to Information, Codes of Ethics, Codes of Conduct, Citizen's Charters, Work culture, Quality of service delivery, Utilization of public funds, challenges of corruption.

60.Case Studies on above issues.

24. Business Communication APTT143:

Course Outcomes:

1. To improve the oral and written communication skills of tourism administrators.
2. To establish rapport with tourists, to gain their goodwill and confidence.

Unit-1:

Communication-definition and model of communication-Verbal and non-verbal communication- importance of communication-Barriers of communication-Body Language- Personal Appearance-Posture- Gestures-Facial expression-Eye contact-Space distancing.

Unit-2:

Language as a tool of communication-the four language skills-speaking listening, reading and writing-English as a link language, Speech sounds of English-British and American English-British and American differences-Vowels-Consonants-Diphthongs Transcription [only monosyllabic and disyllabic words for transcription-Stress-RhythmIntonation-How to use a pronouncing dictionary- Common mistakes in Englishpronouncing in Kerala-Varieties of English-Formal–Informal–Literary-Political correctness.

Unit-3:

Conversational English-English in different situations-Making enquiries, expressing various emotions-agreement-disagreements, happiness, anger etc. Expressing gratitude, apologizing-explaining- giving orders, How to start a conversation–How to end a conversation-building conversation-conservation writing.

Unit 4:

Tips for improving vocabulary and spelling- vocabulary pertaining to tourism and allied subjects alone need be taught.

Unit 5:

Business Correspondence–different types of letters-formal, informal, and official–Preparation of e-mail and fax messages-economy of words-Preparation of applicant's CV

Unit 6:

Dynamic communication-points to be remembered–telephonic conversation Video-Teleconferencing–Interviews-Different types interviewing-protocol for eminent persons-Employment interview-details, assessment interview for data collection, feedback-guest relations-instruction, notes, dictations- types of speeches, anchoring.

Unit 7:

Meetings– Guidelines- Purpose- Agenda- Chairmanship, Arrangements Seminars, Conference, Panel discussion, Convention, Symposium- mode of conduct, notices, circulars, agenda, minutes, memos, protocol- info-kit, checklists-green values, safety-media liaison-theory and practice of Group Discussion.

Unit 8:

Use of audio-visual aids for meetings, seminars-Brochure-Letter heads, Invitation cards, posters, filling documents, paper cuttings, preparing documents for the conference, conference briefing, talks.

Unit 9:

Report–project proposals, reporting events, narrating events, commentaries, explain events, things and facts to tourist–hand book, manuals- product and property marketing.

Reference:

1. Effective English Communication for You - Dr. V. Shyamala, Emerald, 2002.
2. Spoken English for You [Level 1] - G. Radhakrishna Pillai & K. Rajeevan. Emerald.

25. CSIR-UGC National Eligibility Test (NET) for Junior Research Fellowship and Lecturer-ship-Physical Sciences

Part 'A' Core

I. Mathematical Methods of Physics

Dimensional analysis. Vector algebra and vector calculus. Linear algebra, matrices, Cayley-Hamilton

Theorem. Eigenvalues and eigenvectors. Linear ordinary differential equations of first & second order, Special functions (Hermite, Bessel, Laguerre and Legendre functions). Fourier series, Fourier and Laplace transforms. Elements of complex analysis, analytic functions; Taylor & Laurent series; poles, residues and evaluation of integrals. Elementary probability theory, random variables, binomial, Poisson and normal distributions. Central limit theorem.

II. Classical Mechanics

Newton's laws. Dynamical systems, Phase space dynamics, stability analysis. Central force motions. Two body Collisions - scattering in laboratory and Centre of mass frames. Rigid body dynamics moment of inertia tensor. Non-inertial frames and pseudoforces. Variational principle. Generalized coordinates. Lagrangian and Hamiltonian formalism and equations of motion. Conservation laws and cyclic coordinates. Periodic motion: small oscillations, normal modes. Special theory of relativity Lorentz transformations, relativistic kinematics and mass–energy equivalence.

III. Electromagnetic Theory

Electrostatics: Gauss's law and its applications, Laplace and Poisson equations, boundary value problems. Magnetostatics: Biot-Savart law, Ampere's theorem. Electromagnetic induction. Maxwell's equations in free space and linear isotropic media; boundary conditions on the fields at interfaces. Scalar and vector potentials, gauge invariance. Electromagnetic waves in free space. Dielectrics and conductors. Reflection and refraction, polarization, Fresnel's law, interference, coherence, and diffraction. Dynamics of charged particles in static and uniform electromagnetic fields.

IV. Quantum Mechanics

Wave-particle duality. Schrödinger equation (time-dependent and time-independent). Eigenvalue problems (particle in a box, harmonic oscillator, etc.). Tunneling through a barrier. Wave-function in coordinate and momentum representations. Commutators and Heisenberg uncertainty principle. Dirac notation for state vectors. Motion in a central potential: orbital angular momentum, angular momentum algebra, spin, addition of angular momenta; Hydrogen atom. Stern-Gerlach experiment. Time independent perturbation theory and applications. Variational method. Time dependent perturbation theory and Fermi's golden rule, selection rules. Identical particles, Pauli exclusion principle, spin-statistics connection.

V. Thermodynamic and Statistical Physics

Laws of thermodynamics and their consequences. Thermodynamic potentials, Maxwell relations, chemical potential, phase equilibria. Phase space, micro- and macro-states. Micro canonical, and grand-canonical ensembles and partition functions. Free energy and its connection with thermodynamic quantities. Classical and quantum statistics. Ideal Bose and Fermi gases. Principle of detailed balance. Blackbody radiation and Planck's distribution law.

VI. Electronics and Experimental Methods

Semiconductor devices (diodes, junctions, transistors, field effect devices, homo- and hetero junction devices), device structure, device characteristics, frequency dependence and applications. Opto-electronic devices (solar cells, photo-detectors, LEDs). Operational amplifiers and their applications. Digital techniques and applications (registers, counters, comparators and similar circuits). A/D and D/A converters. Microprocessor and microcontroller basics. Data interpretation and analysis. Precision and accuracy. Error analysis, propagation of errors. Least squares fitting,

Part 'B' Advanced

I. Mathematical Methods of Physics

Green's function. Partial differential equations (Laplace, wave and heat equations in two and three dimensions). Elements of computational techniques: root of functions, interpolation, extrapolation, integration by trapezoid and Simpson's rule, Solution of first order differential equation using RungeKutta method. Finite difference methods. Tensors. Introductory group theory: $SU(2)$, $O(3)$.

II. Classical Mechanics

Dynamical systems, Phase space dynamics, stability analysis. Poisson brackets and canonical transformations. Symmetry, invariance and Noether's theorem. Hamilton-Jacobi theory.

III. Electromagnetic Theory

Dispersion relations in plasma. Lorentz invariance of Maxwell's equation. Transmission lines and wave guides. Radiation- from moving charges and dipoles and retarded potentials.

IV. Quantum Mechanics

Spin-orbit coupling, fine structure. WKB approximation. Elementary theory of scattering: phase shifts, partial waves, Born approximation. Relativistic quantum mechanics: Klein-Gordon and Dirac equations. Semi-classical theory of radiation.

V. Thermodynamic and Statistical Physics

First- and second-order phase transitions. Diamagnetism, paramagnetism, and ferromagnetism. Ising model. Bose-Einstein condensation. Diffusion equation. Random walk and Brownian motion. Introduction to nonequilibrium processes.

VI. Electronics and Experimental Methods

Linear and nonlinear curve fitting, chi-square test. Transducers (temperature, pressure/vacuum, magnetic fields, vibration, optical, and particle detectors). Measurement and control. Signal conditioning and recovery. Impedance matching, amplification (Op-amp based, instrumentation amp, feedback), filtering and noise reduction, shielding and grounding. Fourier transforms, lock-in detector, box-car integrator, modulation techniques. High frequency devices (including generators and detectors).

VII. Atomic & Molecular Physics

Quantum states of an electron in an atom. Electron spin. Spectrum of helium and alkali atom. Relativistic corrections for energy levels of hydrogen atom, hyperfine structure and isotopic shift, width of spectrum lines, LS & JJ couplings. Zeeman, Paschen-Bach & Stark effects. Electron spin resonance. Nuclear magnetic resonance, chemical shift. Frank-Condon principle. Born-Oppenheimer approximation. Electronic, rotational, vibrational and Raman spectra of diatomic molecules, selection rules. Lasers: spontaneous and stimulated emission, Einstein A & B coefficients. Optical pumping, population inversion, rate equation. Modes of resonators and coherence length.

VIII. Condensed Matter Physics

Bravais lattices. Reciprocal lattice. Diffraction and the structure factor. Bonding of solids. Elastic properties, phonons, lattice specific heat. Free electron theory and electronic specific heat. Response and relaxation phenomena. Drude model of electrical and thermal conductivity. Hall effect and thermoelectric power. Electron motion in a periodic potential, band theory of solids: metals, insulators and semiconductors. Superconductivity: type-I and type-II superconductors. Josephson junctions. Superfluidity. Defects and dislocations. Ordered phases of matter: translational and orientational order, kinds of liquid crystalline order. Quasi crystals.

IX. Nuclear and Particle Physics

Basic nuclear properties: size, shape and charge distribution, spin and parity. Binding energy, semiempirical mass formula, liquid drop model. Nature of the nuclear force, form of nucleon-

nucleon potential, charge-independence and charge-symmetry of nuclear forces. Deuteron problem. Evidence of shell structure, single-particle shell model, its validity and limitations. Rotational spectra. Elementary ideas of alpha, beta and gamma decays and their selection rules. Fission and fusion. Nuclear reactions, reaction mechanism, compound nuclei and direct reactions. Classification of fundamental forces. Elementary particles and their quantum numbers (charge, spin, parity, isospin, strangeness, etc.). Gellmann-Nishijima formula. Quark model, baryons and mesons. C, P, and T invariance. Application of symmetry arguments to particle reactions. Parity non-conservation in weak interaction. Relativistic kinematics.

26. Creative writing in Malayalam AUML 231

The syllabus is given in Malayalam language can be seen in the link

<http://www.marivanioscollege.com/img/8366UG%20Syllabus%202017.pdf>

27. Certificate Course in Spoken Hindi

Syllabus

Paper 1

Introducing Hindi Alphabets and phonetics. General discussion and familiarizing the Chart of Hindi Read Write and speak Varna.

Study and practice of simple Hindi Language.

Paper 2

Grammar and Translation.

Parts of Speech Sentence making , corrections and Translation practice.

Paper 3

General Conversations and practices. Translations and Technical Terminology.

Assignments and Seminars.

Oral Examination.

Written Examination.