



Government of Kerala
Department of Education

VOCATIONAL HIGHER SECONDARY EDUCATION (VHSE)

SYLLABUS

— First Year —



**State Council of Educational
Research and Training (SCERT)**

Vidyabhavan, Poojappura, Thiruvananthapuram - 695 012

Courses

- 1 **Accounting and Taxation**
 - 2 **Agri -Business and Farm Services**
 - 3 **Agriculture - Crop Health Management**
 - 4 **Agriculture Science and Processing Technology**
 - 5 **Agro Machinery and Power Engineering**
 - 6 **Aquaculture**
 - 7 **Automobile Technology**
 - 8 **Banking and Insurance Services**
 - 9 **Basic Nursing and Palliative care**
 - 10 **Bio Medical Equipment Technology**
 - 11 **Civil Construction Technology**
 - 12 **Computer Science and Information Technology**
 - 13 **Computerised Office Management**
 - 14 **Cosmetology and Beauty Therapy**
 - 15 **Crèche and Pre-school Management**
 - 16 **Customer Relationship Management**
 - 17 **Dairy Technology**
 - 18 **Dental Technology**
 - 19 **ECG & Audiometric Technology**
 - 20 **Electrical and Electronics Technology**
 - 21 **Electronics and Communication Technology**
 - 22 **Fashion and Apparel Designing**
 - 23 **Food and Restaurant Management**
 - 24 **Graphic Design and Printing Technology**
 - 25 **Livestock Management**
 - 26 **Marine Fisheries & Seafood Processing**
 - 27 **Marine Technology**
 - 28 **Marketing and Financial services**
 - 29 **Medical Laboratory Technology**
 - 30 **Physical Education**
 - 31 **Physiotherapy**
 - 32 **Polymer Technology**
 - 33 **Refrigeration and Air-Conditioning**
 - 34 **Textile Technology**
 - 35 **Travel and Tourism**
 - 36 **Entrepreneurship Development (Non Vocational)**
 - 37 **Management (Non-vocational)**
-

ACCOUNTING AND TAXATION

MODULE 1 - OFFICE AUTOMATION FOR BUSINESS

UNIT 1.1 Information Technology

Introduction to Information Technology - Data processing - Data presented inside a computer - Characteristics of computers - History of computers - Evolution of computers - Classification of computers - Hard wired programming and stored program concept - Computer Organisation - Computer as a data processing machine - Basic computer operations - Functional units - System components - Input/ Output ports (I/O ports) - Microprocessor - The Memory - Memory organisation - Types of memory - Advanced portable storage devices - Memory hierarchy - Input/Output Devices - Computer Software - Software - Classification of software - Malicious Software - Copyright - Software piracy-Licensing - Free software philosophy - Application of information Technology - Communication - Business - Medicine and Health care - Entertainment - E-Governance - Education - Engineering manufacturing - Science - IT policy in Kerala state - E-commerce - M-commerce - Online trading - Net-Banking

UNIT 1.2 Computer hardware and operating system

Components of a Personal Computer - Parts of a personal computer - Booting - BIOS - POST - Disk Operating System - Windows 7 OS - Basic file and folder operations - Accessories - Installing and Managing Windows 7 - Steps to install Windows 7 - Hard drive preparation - Formatting - Device Driver - Installing a printer driver - Changing file views in windows7 - Control panel - User creation and rights - Trouble shooting - Creating start-up disk - Sharing files - Internet connection and Firewall - Windows Explorer- Installing MS office- Installing DTP software - Installing Tally - Maintaining Computer Software - Transferring computer data

UNIT 1.3 Office Automation

Office Automation basics - Concept of office - Nature of work in office - Need for office automation - MS Word- User interface of MS word - Creating a document - MS Excel - Starting MS Excel - User interface of MS Excel- The work sheet - Formulae - Sorting - Working with chart - MS Power point - Creating presentation indifferent ways - Inserting a new slide - Adding themes - Saving a presentation- Set up the show - MS Access -Advantages of DBMS - Data Models - Terminologies used in RBDMS - MS Access - Creating a query in the query design option - Creating a form using Form wizard - Reports - Import - MS Outlook

UNIT 1.4 Linux and open office

Introduction to Linux -History of Linux - Advantages of GNU Linux - Linux file system structure - Linux Kernel - Login and logout in Linux - Linux command - Open Office writer - Introduction to Open office - Apache Open Office - System requirement Starting Open Office Writer - Advanced features of Open Office Writer - Character Formatting - Background Colour - Paragraph Formatting -

Bullets and Numbering - Indents - Creating an index of a document - Open office calc -Selecting cells - Cell formatting - Inserting Rows/Columns - Built in functions - Charts in Calc - Addressing Cells - Data Range - Work sheet -Auto fill – Filter - Data Sorting - Totals and sub totals - Protection - Open office impress - Important features of impress - Bringing different objects into slides - Adding Text - Different views - Adding New Slides to Your Presentation – Background - Slide Transition -Animating objects in a slide -Watching slide show.

UNIT1.5 Internet and Malayalam computing

Introduction Computer Networks - LAN Topologies – Protocols - Connectivity devices -Windows 7 Firewall Settings - Internet and E-mail - History of the Internet - Connecting Computer to Internet Connection - World Wide Web (WWW) - Web Browser - Search Engines - E-mail (Electronic mail) - Creating and using free email account with G-mail - Types of Internet Web page Designing – HTML-Starting with HTML - Attributes of <HTML> tag-Malayalam Computing - Malayalam through Computers - Free Software and Language Computing - Malayalam and Technology - Malayalam digital Technology – Unicode -Malayalam Using Transliteration - Malayalam Word Processing - Downloading and Installing Malayalam Fonts - Installing Fonts in Windows - How to enable Malayalam in Web Browsers - Malayalam in UBUNTU - Malayalam keyboard and Typing - Ethical and Social Issues in Information Systems.

MODULE 2 - MANUAL ACCOUNTING PRACTICES

UNIT 2.1 Manual Accounting

Business transaction-meaning and types-Basic accounting terms-Accounting Equation/Balance sheet equation-Accounting rules –modern approach-Accounting from source document/voucher-types of vouchers-Familiarising VAT/GST and TDS (**VAT must be replaced with GST as and when GST implements**)-Collect the account books(day book and ledger) for accounting purpose-Record transactions based on the source documents collected or prepared in the journal and subsidiary books-prepare ledger and prepare trial balance

UNIT 2.2 Bank Reconciliation Statement

Meaning of BRS-Reason for disagreement in cash book and pass book balance-Adjusted cashbook and BRS preparation

UNIT 2.3 Audit in Practice

Meaning and objectives of audit-Vouching and verification-Meaning and types of vouchers-Types of audit-Statutory, private and govt audit, Continuous, Final Interim Audits-internal and External audits

UNIT 2.4 Accounting for materials

Material control –Meaning and stages-Purchase procedure-Stores control-ABC analysis and VED analysis.-Inventory control-Stock levels, EOQ and JIT purchasing-Stock records-bin card and stores ledger-Inventory systems-periodic and perpetual-Preparation of Bin card –Preparation of Stores ledger under FIFO, LIFO and Weighted Average price method.

AGRI BUSINESS AND FARM SERVICES

MODULE - 1

AGRI FIELD TECHNIQUES

1. Introductory Agriculture

Agriculture-definition, branches, milestones in agriculture development in India, Major crops in India and Kerala, Area, production and productivity of major crops in Kerala, Important Agricultural Institutions- teaching and research institutions, extension centres, agri based government and semi government organisations.

2. Agrometeorology

Meteorology-agricultural meteorology-definition, weather and climate, microclimate, meteorological observatory and instruments to measure weather elements, automated weather stations, weather forecasting, Crop seasons in India and Kerala, Monsoons in Kerala

3. Soil health management

Soil profile, physical properties-soil structure and texture, Soils of Kerala-problem soils of Kerala, Soil acidity- liming materials, soil alkalinity and its amelioration, Soil erosion-definition, types of erosion-water erosion- Wind erosion- Soil and water conservation-agronomic measures- mulching, contour farming, strip cropping, alley cropping, multitier cropping, mixed cropping, intercropping, crop rotation, grass/fodder cultivation, cover cropping, zero tillage, biofencing/vegetative fencing. Engineering measures- Percolation pits/ soak pits, contour bunding, making basins around trees, trenches, bench terracing, check dams, gabions, inward and outward terracing, brushwood check dams, gabion checkdams, artificial water holding structures and renovation of existing bunds, weirs, sidewalls, geotextiles. Soil pollution- causes, practices to maintain soil health, Soil quality monitoring- Soil health card, Remote Sensing and GIS.

Tillage-definition and objectives, types and effects of tillage in soil- zero tillage, minimum tillage, primary and secondary tillage implements, and small farm machinery

Plant Nutrition- Essential elements-macro and micro, Functions, Deficiency and toxicity symptoms of N, P, K. Manures and fertilizers-classification, Organic manures- bulky and concentrated- FYM, compost, different composting methods, green manuring. Chemical fertilizers-straight, complex, mixed fertilizers, biofertilizers- examples and use. Integrated Nutrient Management, Methods of fertilizer application, Calculation of fertilizer requirement, KAU Fertulator, Soil fertility evaluation- soil testing, plant tissue analysis-DRIS methods, critical levels in plants, rapid tissue test, indicator plants, biological methods of soil fertility evaluation, Soil based plant nutrient management information system. Organic farming and sustainable agriculture- Component of organic farming and their role

in sustainable crop production, nutrient management in organic farming, disease and pest management in organic farming.

4. Irrigation technology

Irrigation-definition, methods of irrigation- surface, subsurface, micro irrigation, special methods (drip, sprinkler, mist, bubbler, pivot), fertigation, chemigation, quality of irrigation water and its management, drainage- importance in crop production, Rainwater harvesting-techniques and structures-ferrocement tank, percolation pits(emerging innovative models)

5. Plant propagation techniques

Types of propagation-sexual propagation-seed- definition, qualities of good seed, classes of seed, sowing methods, seed propagation- seed bed preparation, hybrid seed propagation, vegetable seedling production, portray seedling production. Seed testing- methods of testing germination percentage. Asexual propagation methods - cutting, layering, budding, grafting, tissue culture, vegetable grafting

6. Crop Pest management

Pest-definition, classification with examples, plant disease-common symptoms and pathogens, weeds-uses and harmful effects, dryland and wetland weeds, Plant protection methods, Biopharmacy, plant protection chemicals and different formulations (emphasis to new generation pesticides), plant protection equipments, weed management, E- Crop Doctor, Crop diagnostic centres.

MODULE – 2

CROP PRODUCTION TECHNOLOGY

1. Agronomic classification of crops:

Cereals - Pulses - Millets - Oil seeds -Tuber crops - Fruits - Vegetables - Spices and Condiments - Plantation crops - Medicinal and aromatic plants -Fibre crops - Sugar crops - Fodder crops - Narcotic crops - Green Manure crops.

2. Farming system

Concept and different types of farming system with examples

Their merits and demerits - Monocropping - Crop rotation - Inter cropping - Mixed cropping - Ratoon cropping - Multi-tier cropping - Relay cropping - Mixed farming - Homestead farming.

Integrated Farming System-Concepts -Goals - Components -Mushroom, Vermiconpost, Azolla, Livestock, Poultry, Aquaculture, Biogas Plant - Advantages and disadvantages - Success Stories.

3. Crop production Technology of Field crops

RICE

Climatic requirements - Soil - Season - Varieties (Include Recent varieties and Geographic indexing) - Seed rate - Seed Treatment - Nursery preparation - Wet - Dry - Dapog - Spacing - Fertilizer Recommendation - Common weeds in Rice fields - *Kole*, *Pokkali*, *Kaipad* cultivation - Transplanting - IPDM- System of Rice Intensification(SRI) technique - Scope of farm Mechanization in rice cultivation and Post Harvest Handling-Value addition-Current Trends in Rice production(For additional information only)



TAPIOCA

Climatic requirements - Soil - Varieties - Propagation - Mini sett propagation technique - Preparation of Land - Season and Planting - Manuring - Irrigation - Intercropping - Value addition - Pests and Diseases - Biopesticide from Tapioca. Current trends in Tapioca production (For additional information only).

FODDER CROPS

Guinea grass - Hybrid Napier - Congo Signal Grass - Subabul - Agathi - Stylo - Mention Silo, Silage, Haylage-Planting material-Fertilizer recommendations-Harvesting -Yield-varieties.

4. Crop production Technology of Vegetables

Solanaceous vegetables.

Brinjal – Tomato – Chilli, Varieties -Seed rate -Spacing - Manuring - Pest and Diseases

Cucurbitaceous vegetables

Bitter gourd – Snake gourd - Bottle gourd – Ash gourd – Pumpkin – gherkins, Varieties - Seed rate - Spacing - Manuring - Pest and Diseases

Cool Season vegetables

Carrot – Cabbage – Cauliflower, Varieties - Seed rate- Spacing - Manuring - Pest and Diseases.

Amaranthus, Bhindi, Cow pea

Varieties - Seed rate- Spacing - Manuring -Pest and Diseases

Kitchen garden, Terrace Cultivation

Current Trends in Vegetable Cultivation (for additional information only)

5. Crop production Technology of Plantation crops

COCONUT

Scientific name -Soil -Site selection -Important Cultivars /Hybrids - Coconut Nursery Techniques (Mother palm selection, seed nut storage, Coconut nursery preparation and seedling selection) - Cultivation practices - Land Preparation - Planting - Spacing - Planting systems - Time of Planting - Irrigation – different techniques – drip irrigation- Weeding - Intercropping - Drought management - Husk burial - Mulching - Cover crops and green manure crops - Manuring. Plant protection - Pests – Rhinoceros beetle, Redpalm weevil, Black headed Caterpillar, Eriophid mite, Nut crinkler. Diseases-Bud rot, Stempleeding, Rootwilt, Tanjore wilt - Management with special emphasis on Biocontrol. Value addition - Different products made out of coconut-Current trends in coconut cultivation(for additional information only)

b. RUBBER

Scientific name - Soil - Site selection - Important varieties/Clones - Nursery - Cultivation practices - Land Preparation - Planting clones – Planting distance, Pitting and refilling, Type of planting - Cover cropping and Mulching – Manuring - Weeding - Use of rainguard - Tapping -Plant protection - Pests, Diseases - Abnormal leaf fall, Powdery mildew, Pink disease-Value addition - Different

products made out of Rubber -Current trends in Rubber and allied industries (for additional information only)

PEPPER

Scientific name - Soil- Site selection - Important Varieties -Selection Of mother plants - Raising rooted cuttings -Cultivation practices - Land Preparation - Planting vines- Spacing - Planting methods - Time of Planting - Irrigation - Weeding-Under planting - Manuring-Bush pepper. Plant protection - Pests - Pollu beetle, Marginal gall thrips - Diseases - Quick wilt, Anthracnose, Slow decline. Value addition - Different products made out of Pepper - Current trends (for additional information only)

6. Crop production Technology of Fruits

BANANA

Scientific name - Soil - Site selection - Important Varieties - Sucker selection and preparation of suckers for planting - Cultivation practices - Land Preparation - Planting suckers - Spacing - time of Planting - Irrigation - Weeding - Intercropping - Manuring -Tissue culture techniques in Banana -Leaf Banana cultivation. Plant protection - Pests – Pseudostem weevil, Rhizome weevil, Aphids, mealy bugs, skipper butterfly- Diseases Bunchy top, Banana bract mosaic (Kokkan) - Sigatoka - Rhizome rot-Panama wilt. Value addition- Different products made out of Banana current trends in banana cultivation (for additional information only)

MANGO

Scientific name - Soil -Season - Site selection - Propagation - Important Varieties - Cultivation practices - Land Preparation - Planting - Spacing -Time of Planting- Irrigation-Weeding- Intercropping - Manuring - High Density Planting in Mango. Plant protection - Pests – Stem borer, Mango Hopper, Nut weevil, Fruit fly- Diseases-Powdery mildew, Anthracnose, Die back - Physiological disorders -Value addition - Different products made out of Mango -Current trends in Mango cultivation (for additional information only)

PINE APPLE

Scientific name - Soil - Site selection - Important Varieties - Sucker selection and preparation of suckers for planting - Cultivation practices- Land Preparation - planting suckers - Spacing - Time of Planting - Irrigation - Weeding - Flowering induction - Manuring -Plant protection - Pests –Mealy bug - Diseases – Leaf spot - Value addition-Different products made out of Pineapple.

7. Crop Production Technology of Flowers

ANTHURIUM

Varieties - Propagation - Planting and Potting media preparation - Fertilizer recommendation - Inter cultural Operation - Plant Protection - Harvesting.

ORCHID

Varieties - Propagation- Planting and Potting media preparation- Manuring - Intercultural Operation - Plant Protection - Harvesting.

**ROSE**

Classification –Varities-Propagation - Planting and Potting mixture preparation - Manuring – Pruning- Plant protection -Harvesting - Packing and Marketing - Value added product – Rose oil.

JASMINE

Soil - Climate- Important Cultivars and varieties - Propagation – Rooting Hormone - Land preparation - Spacing - Manuring - Irrigation - Pruning - Intercultural operation - Weed control - Pest and diseases - Value added products - Jasmine oil.

8. Importance of Medicinal Plants in Kerala

Introduction – Common medicinal plants cultivated in Kerala with their common name, parts used, scope of medicinal plant cultivation in Ayurveda.

AGRICULTURAL SCIENCE & PROCESSING TECHNOLOGY

MODULE - 1

AGRI FIELD TECHNIQUES

1. Introductory Agriculture

Agriculture-definition, branches, milestones in agriculture development in India, Major crops in India and Kerala, Area, production and productivity of major crops in Kerala, Important Agricultural Institutions- teaching and research institutions, extension centres, agri based government and semi government organisations.

2. Agrometeorology

Meteorology-agricultural meteorology-definition, weather and climate, microclimate, meteorological observatory and instruments to measure weather elements, automated weather stations, weather forecasting, Crop seasons in India and Kerala, Monsoons in Kerala

3. Soil health management

Soil profile, physical properties-soil structure and texture, Soils of Kerala-problem soils of Kerala, Soil acidity- liming materials, soil alkalinity and its amelioration, Soil erosion-definition, types of erosion-water erosion- Wind erosion- Soil and water conservation-agronomic measures- mulching, contour farming, strip cropping, alley cropping, multitier cropping, mixed cropping, intercropping, crop rotation, grass/fodder cultivation, cover cropping, zero tillage, biofencing/vegetative fencing. Engineering measures- Percolation pits/ soak pits, contour bunding, making basins around trees, trenches, bench terracing, check dams, gabions, inward and outward terracing, brushwood check dams, gabion checkdams, artificial water holding structures and renovation of existing bunds, weirs, sidewalls, geotextiles. Soil pollution- causes, practices to maintain soil health, Soil quality monitoring- Soil health card, Remote Sensing and GIS.

Tillage-definition and objectives, types and effects of tillage in soil- zero tillage, minimum tillage, primary and secondary tillage implements, and small farm machinery

Plant Nutrition- Essential elements-macro and micro, Functions, Deficiency and toxicity symptoms of N, P, K. Manures and fertilizers-classification, Organic manures- bulky and concentrated- FYM, compost, different composting methods, green manuring. Chemical fertilizers-straight, complex, mixed fertilizers, biofertilizers- examples and use. Integrated Nutrient Management, Methods of fertilizer application, Calculation of fertilizer requirement, KAU Fertulator, Soil fertility evaluation- soil testing, plant tissue analysis-DRIS methods, critical levels in plants, rapid tissue test, indicator plants, biological methods of soil fertility evaluation, Soil based plant nutrient management information system. Organic farming and sustainable agriculture- Component of organic farming and their role



in sustainable crop production, nutrient management in organic farming, disease and pest management in organic farming.

4. Irrigation technology

Irrigation-definition, methods of irrigation- surface, subsurface, micro irrigation, special methods (drip, sprinkler, mist, bubbler, pivot), fertigation, chemigation, quality of irrigation water and its management, drainage- importance in crop production, Rainwater harvesting-techniques and structures-ferrocement tank, percolation pits(emerging innovative models)

5. Plant propagation techniques

Types of propagation-sexual propagation-seed- definition, qualities of good seed, classes of seed, sowing methods, seed propagation- seed bed preparation, hybrid seed propagation, vegetable seedling production, portray seedling production. Seed testing- methods of testing germination percentage. Asexual propagation methods - cutting, layering, budding, grafting, tissue culture, vegetable grafting

6. Crop Pest management

Pest-definition, classification with examples, plant disease-common symptoms and pathogens, weeds-uses and harmful effects, dryland and wetland weeds, Plant protection methods, Biopharmacy, plant protection chemicals and different formulations (emphasis to new generation pesticides), plant protection equipments, weed management, E- Crop Doctor, Crop diagnostic centres.

MODULE – 2

CROP PRODUCTION TECHNOLOGY

1. Agronomic classification of crops:

Cereals - Pulses - Millets - Oil seeds -Tuber crops - Fruits - Vegetables - Spices and Condiments - Plantation crops - Medicinal and aromatic plants -Fibre crops - Sugar crops - Fodder crops - Narcotic crops - Green Manure crops.

2. Farming system

Concept and different types of farming system with examples

Their merits and demerits - Monocropping - Crop rotation - Inter cropping - Mixed cropping - Ratoon cropping - Multi-tier cropping - Relay cropping - Mixed farming - Homestead farming.

Integrated Farming System-Concepts -Goals - Components -Mushroom, Vermiconpost, Azolla, Livestock, Poultry, Aquaculture, Biogas Plant - Advantages and disadvantages - Success Stories.

3. Crop production Technology of Field crops

RICE

Climatic requirements - Soil - Season - Varieties (Include Recent varieties and Geographic indexing) - Seed rate - Seed Treatment - Nursery preparation - Wet - Dry - Dapog - Spacing - Fertilizer Recommendation - Common weeds in Rice fields - *Kole*, *Pokkali*, *Kaipad* cultivation - Transplanting - IPDM- System of Rice Intensification(SRI) technique - Scope of farm Mechanization in rice cultivation and Post Harvest Handling-Value addition-Current Trends in Rice production(For additional information only)

TAPIOCA

Climatic requirements - Soil - Varieties - Propagation - Mini sett propagation technique - Preparation of Land - Season and Planting - Manuring - Irrigation - Intercropping - Value addition - Pests and Diseases - Biopesticide from Tapioca. Current trends in Tapioca production (For additional information only).

FODDER CROPS

Guinea grass - Hybrid Napier - Congo Signal Grass - Subabul - Agathi - Stylo - Mention Silo, Silage, Haylage-Planting material-Fertilizer recommendations-Harvesting -Yield-varieties.

4. Crop production Technology of Vegetables

Solanaceous vegetables.

Brinjal – Tomato – Chilli, Varieties -Seed rate -Spacing - Manuring - Pest and Diseases

Cucurbitaceous vegetables

Bitter gourd – Snake gourd - Bottle gourd – Ash gourd – Pumpkin – gherkins, Varieties - Seed rate - Spacing - Manuring - Pest and Diseases

Cool Season vegetables

Carrot – Cabbage – Cauliflower, Varieties - Seed rate- Spacing - Manuring - Pest and Diseases.

Amaranthus, Bhindi, Cow pea

Varieties - Seed rate- Spacing - Manuring -Pest and Diseases

Kitchen garden, Terrace Cultivation

Current Trends in Vegetable Cultivation (for additional information only)

5. Crop production Technology of Plantation crops

COCONUT

Scientific name -Soil -Site selection -Important Cultivars /Hybrids - Coconut Nursery Techniques (Mother palm selection, seed nut storage, Coconut nursery preparation and seedling selection) - Cultivation practices - Land Preparation - Planting - Spacing - Planting systems - Time of Planting - Irrigation – different techniques – drip irrigation- Weeding - Intercropping - Drought management - Husk burial - Mulching - Cover crops and green manure crops - Manuring. Plant protection - Pests – Rhinoceros beetle, Redpalm weevil, Black headed Caterpillar, Eriophid mite, Nut crinkler. Diseases-Bud rot, Stempleeding, Rootwilt, Tanjore wilt - Management with special emphasis on Biocontrol. Value addition - Different products made out of coconut-Current trends in coconut cultivation(for additional information only)

b. RUBBER

Scientific name - Soil - Site selection - Important varieties/Clones - Nursery - Cultivation practices - Land Preparation - Planting clones – Planting distance, Pitting and refilling, Type of planting - Cover cropping and Mulching – Manuring - Weeding - Use of rainguard - Tapping -Plant protection - Pests, Diseases - Abnormal leaf fall, Powdery mildew, Pink disease-Value addition - Different

products made out of Rubber -Current trends in Rubber and allied industries (for additional information only)

PEPPER

Scientific name - Soil- Site selection - Important Varieties -Selection Of mother plants - Raising rooted cuttings -Cultivation practices - Land Preparation - Planting vines- Spacing - Planting methods - Time of Planting - Irrigation - Weeding-Under planting - Manuring-Bush pepper. Plant protection - Pests - Pollu beetle, Marginal gall thrips - Diseases - Quick wilt, Anthracnose, Slow decline. Value addition - Different products made out of Pepper - Current trends (for additional information only)

6. Crop production Technology of Fruits

BANANA

Scientific name - Soil - Site selection - Important Varieties - Sucker selection and preparation of suckers for planting - Cultivation practices - Land Preparation - Planting suckers - Spacing - time of Planting - Irrigation - Weeding - Intercropping - Manuring -Tissue culture techniques in Banana -Leaf Banana cultivation. Plant protection - Pests – Pseudostem weevil, Rhizome weevil, Aphids, mealy bugs, skipper butterfly- Diseases Bunchy top, Banana bract mosaic (Kokkan) - Sigatoka - Rhizome rot-Panama wilt. Value addition- Different products made out of Banana current trends in banana cultivation (for additional information only)

MANGO

Scientific name - Soil -Season - Site selection - Propagation - Important Varieties - Cultivation practices - Land Preparation - Planting - Spacing -Time of Planting- Irrigation-Weeding- Intercropping - Manuring - High Density Planting in Mango. Plant protection - Pests – Stem borer, Mango Hopper, Nut weevil, Fruit fly- Diseases-Powdery mildew, Anthracnose, Die back - Physiological disorders -Value addition - Different products made out of Mango -Current trends in Mango cultivation (for additional information only)

PINE APPLE

Scientific name - Soil - Site selection - Important Varieties - Sucker selection and preparation of suckers for planting - Cultivation practices- Land Preparation - planting suckers - Spacing - Time of Planting - Irrigation - Weeding - Flowering induction - Manuring -Plant protection - Pests –Mealy bug - Diseases – Leaf spot - Value addition-Different products made out of Pineapple.

7. Crop Production Technology of Flowers

ANTHURIUM

Varieties - Propagation - Planting and Potting media preparation - Fertilizer recommendation - Inter cultural Operation - Plant Protection - Harvesting.

ORCHID

Varieties - Propagation- Planting and Potting media preparation- Manuring - Intercultural Operation - Plant Protection - Harvesting.

ROSE

Classification –Varities-Propagation - Planting and Potting mixture preparation - Manuring – Pruning- Plant protection -Harvesting - Packing and Marketing - Value added product – Rose oil.

JASMINE

Soil - Climate- Important Cultivars and varieties - Propagation – Rooting Hormone - Land preparation - Spacing - Manuring - Irrigation - Pruning - Intercultural operation - Weed control - Pest and diseases - Value added products - Jasmine oil.

8. Importance of Medicinal Plants in Kerala

Introduction – Common medicinal plants cultivated in Kerala with their common name, parts used, scope of medicinal plant cultivation in Ayurveda.

AGRICULTURE - CROP HEALTH MANAGEMENT

MODULE - 1

AGRI FIELD TECHNIQUES

1. Introductory Agriculture

Agriculture-definition, branches, milestones in agriculture development in India, Major crops in India and Kerala, Area, production and productivity of major crops in Kerala, Important Agricultural Institutions- teaching and research institutions, extension centres, agri based government and semi government organisations.

2. Agrometeorology

Meteorology-agricultural meteorology-definition, weather and climate, microclimate, meteorological observatory and instruments to measure weather elements, automated weather stations, weather forecasting, Crop seasons in India and Kerala, Monsoons in Kerala

3. Soil health management

Soil profile, physical properties-soil structure and texture, Soils of Kerala-problem soils of Kerala, Soil acidity- liming materials, soil alkalinity and its amelioration, Soil erosion-definition, types of erosion-water erosion- Wind erosion- Soil and water conservation-agronomic measures- mulching, contour farming, strip cropping, alley cropping, multitier cropping, mixed cropping, intercropping, crop rotation, grass/fodder cultivation, cover cropping, zero tillage, biofencing/vegetative fencing. Engineering measures- Percolation pits/ soak pits, contour bunding, making basins around trees, trenches, bench terracing, check dams, gabions, inward and outward terracing, brushwood check dams, gabion checkdams, artificial water holding structures and renovation of existing bunds, weirs, sidewalls, geotextiles. Soil pollution- causes, practices to maintain soil health, Soil quality monitoring- Soil health card, Remote Sensing and GIS.

Tillage-definition and objectives, types and effects of tillage in soil- zero tillage, minimum tillage, primary and secondary tillage implements, and small farm machinery

Plant Nutrition- Essential elements-macro and micro, Functions, Deficiency and toxicity symptoms of N, P, K. Manures and fertilizers-classification, Organic manures- bulky and concentrated- FYM, compost, different composting methods, green manuring. Chemical fertilizers-straight, complex, mixed fertilizers, biofertilizers- examples and use. Integrated Nutrient Management, Methods of fertilizer application, Calculation of fertilizer requirement, KAU Fertulator, Soil fertility evaluation- soil testing, plant tissue analysis-DRIS methods, critical levels in plants, rapid tissue test, indicator plants, biological methods of soil fertility evaluation, Soil based plant nutrient management information system. Organic farming and sustainable agriculture- Component of organic farming and their role

in sustainable crop production, nutrient management in organic farming, disease and pest management in organic farming.

4. Irrigation technology

Irrigation-definition, methods of irrigation- surface, subsurface, micro irrigation, special methods (drip, sprinkler, mist, bubbler, pivot), fertigation, chemigation, quality of irrigation water and its management, drainage- importance in crop production, Rainwater harvesting-techniques and structures-ferrocement tank, percolation pits(emerging innovative models)

5. Plant propagation techniques

Types of propagation-sexual propagation-seed- definition, qualities of good seed, classes of seed, sowing methods, seed propagation- seed bed preparation, hybrid seed propagation, vegetable seedling production, portray seedling production. Seed testing- methods of testing germination percentage. Asexual propagation methods - cutting, layering, budding, grafting, tissue culture, vegetable grafting

6. Crop Pest management

Pest-definition, classification with examples, plant disease-common symptoms and pathogens, weeds-uses and harmful effects, dryland and wetland weeds, Plant protection methods, Biopharmacy, plant protection chemicals and different formulations (emphasis to new generation pesticides), plant protection equipments, weed management, E- Crop Doctor, Crop diagnostic centres.

MODULE – 2

CROP PRODUCTION TECHNOLOGY

1. Agronomic classification of crops:

Cereals - Pulses - Millets - Oil seeds -Tuber crops - Fruits - Vegetables - Spices and Condiments - Plantation crops - Medicinal and aromatic plants -Fibre crops - Sugar crops - Fodder crops - Narcotic crops - Green Manure crops.

2. Farming system

Concept and different types of farming system with examples

Their merits and demerits - Monocropping - Crop rotation - Inter cropping - Mixed cropping - Ratoon cropping - Multi-tier cropping - Relay cropping - Mixed farming - Homestead farming.

Integrated Farming System-Concepts -Goals - Components -Mushroom, Vermiconpost, Azolla, Livestock, Poultry, Aquaculture, Biogas Plant - Advantages and disadvantages - Success Stories.

3. Crop production Technology of Field crops

RICE

Climatic requirements - Soil - Season - Varieties (Include Recent varieties and Geographic indexing) - Seed rate - Seed Treatment - Nursery preparation - Wet - Dry - Dapog - Spacing - Fertilizer Recommendation - Common weeds in Rice fields - *Kole*, *Pokkali*, *Kaipad* cultivation - Transplanting - IPDM- System of Rice Intensification(SRI) technique - Scope of farm Mechanization in rice cultivation and



Post Harvest Handling-Value addition-Current Trends in Rice production(For additional information only)

TAPIOCA

Climatic requirements - Soil - Varieties - Propagation - Mini sett propagation technique - Preparation of Land - Season and Planting - Manuring - Irrigation - Intercropping - Value addition - Pests and Diseases - Biopesticide from Tapioca. Current trends in Tapioca production (For additional information only).

FODDER CROPS

Guinea grass - Hybrid Napier - Congo Signal Grass - Subabul - Agathi - Stylo - Mention Silo, Silage, Haylage-Planting material-Fertilizer recommendations-Harvesting -Yield-varieties.

4. Crop production Technology of Vegetables

Solanaceous vegetables.

Brinjal – Tomato – Chilli, Varieties -Seed rate -Spacing - Manuring - Pest and Diseases

Cucurbitaceous vegetables

Bitter gourd – Snake gourd - Bottle gourd – Ash gourd – Pumpkin – gherkins, Varieties - Seed rate - Spacing - Manuring - Pest and Diseases

Cool Season vegetables

Carrot – Cabbage – Cauliflower, Varieties - Seed rate- Spacing - Manuring - Pest and Diseases.

Amaranthus, Bhindi, Cow pea

Varieties - Seed rate- Spacing - Manuring -Pest and Diseases

Kitchen garden, Terrace Cultivation

Current Trends in Vegetable Cultivation (for additional information only)

5. Crop production Technology of Plantation crops

COCONUT

Scientific name -Soil -Site selection -Important Cultivars /Hybrids - Coconut Nursery Techniques (Mother palm selection, seed nut storage, Coconut nursery preparation and seedling selection) - Cultivation practices - Land Preparation - Planting - Spacing - Planting systems - Time of Planting - Irrigation – different techniques – drip irrigation- Weeding - Intercropping - Drought management - Husk burial - Mulching - Cover crops and green manure crops - Manuring. Plant protection - Pests – Rhinoceros beetle, Redpalm weevil, Black headed Caterpillar, Eriophid mite, Nut crinkler. Diseases-Bud rot, Stembleeding, Rootwilt, Tanjore wilt - Management with special emphasis on Biocontrol. Value addition - Different products made out of coconut-Current trends in coconut cultivation(for additional information only)

b. RUBBER

Scientific name - Soil - Site selection - Important varieties/Clones - Nursery - Cultivation practices - Land Preparation - Planting clones – Planting distance, Pitting and refilling, Type of planting - Cover cropping and Mulching – Manuring

- Weeding - Use of rainguard - Tapping -Plant protection - Pests, Diseases - Abnormal leaf fall, Powdery mildew, Pink disease-Value addition - Different products made out of Rubber -Current trends in Rubber and allied industries (for additional information only)

PEPPER

Scientific name - Soil- Site selection - Important Varieties -Selection Of mother plants - Raising rooted cuttings -Cultivation practices - Land Preparation - Planting vines- Spacing - Planting methods - Time of Planting - Irrigation - Weeding-Under planting - Manuring-Bush pepper. Plant protection - Pests - Pollu beetle, Marginal gall thrips - Diseases - Quick wilt, Anthracnose, Slow decline. Value addition - Different products made out of Pepper - Current trends (for additional information only)

6. Crop production Technology of Fruits

BANANA

Scientific name - Soil - Site selection - Important Varieties - Sucker selection and preparation of suckers for planting - Cultivation practices - Land Preparation - Planting suckers - Spacing - time of Planting - Irrigation - Weeding - Intercropping - Manuring -Tissue culture techniques in Banana -Leaf Banana cultivation. Plant protection - Pests – Pseudostem weevil, Rhizome weevil, Aphids, mealy bugs, skipper butterfly- Diseases Bunchy top, Banana bract mosaic (Kokkan) - Sigatoka - Rhizome rot-Panama wilt. Value addition- Different products made out of Banana current trends in banana cultivation (for additional information only)

MANGO

Scientific name - Soil -Season - Site selection - Propagation - Important Varieties - Cultivation practices - Land Preparation - Planting - Spacing -Time of Planting- Irrigation-Weeding- Intercropping - Manuring - High Density Planting in Mango. Plant protection - Pests – Stem borer, Mango Hopper, Nut weevil, Fruit fly- Diseases-Powdery mildew, Anthracnose, Die back - Physiological disorders -Value addition - Different products made out of Mango -Current trends in Mango cultivation (for additional information only)

PINE APPLE

Scientific name - Soil - Site selection - Important Varieties - Sucker selection and preparation of suckers for planting - Cultivation practices- Land Preparation - planting suckers - Spacing - Time of Planting - Irrigation - Weeding - Flowering induction - Manuring -Plant protection - Pests –Mealy bug - Diseases – Leaf spot - Value addition-Different products made out of Pineapple.

7. Crop Production Technology of Flowers

ANTHURIUM

Varieties - Propagation - Planting and Potting media preparation - Fertilizer recommendation - Inter cultural Operation - Plant Protection - Harvesting.

ORCHID

Varieties - Propagation- Planting and Potting media preparation- Manuring - Intercultural Operation - Plant Protection - Harvesting.

**ROSE**

Classification –Varities-Propagation - Planting and Potting mixture preparation - Manuring – Pruning- Plant protection -Harvesting - Packing and Marketing - Value added product – Rose oil.

JASMINE

Soil - Climate- Important Cultivars and varieties - Propagation – Rooting Hormone - Land preparation - Spacing - Manuring - Irrigation - Pruning - Intercultural operation - Weed control - Pest and diseases - Value added products - Jasmine oil.

8. Importance of Medicinal Plants in Kerala

Introduction – Common medicinal plants cultivated in Kerala with their common name, parts used, scope of medicinal plant cultivation in Ayurveda.

AGRO MACHINERY & POWER ENGINEERING

Basic Engineering and Workshop Technology (340 periods)

Unit 1 - Measuring Instruments (30 Periods)

- 1.1.1 Introduction to measuring Instruments
- 1.1.2 Classification - Precision and non precision.
- 1.1.3 Precision-instruments-Micrometer, Vernier caliper, Gauges,
- 1.1.4 Non Precision-instruments-Steel rule, dividers, depth gauges, Calipers
Inside, out side

Unit 2 - Workshop Technology (140 periods)

- 1.2.1 Introduction, Safety precautions, Classification of Different Processes.
- 1.2.2 Carpentry - Identification and use of different tools, Handling, Practicing, cutting, Planing, boring etc., Learning to make different carpentry joints- Halving, butt, corner, mortise and Tenon joints.
- 1.2.3 Bench Work and fitting - Introduction, study of tools handling, Practicing, Fitting works.
- 1.2.4 Sheet metal - Introduction, study of tools handling, making joints, Making useful articles using sheets like boxes, small bins etc.
- 1.2.5 Metal joining process - Welding, brazing, soldering
Welding - Introduction, Tools - identification, handling. Types of welding, practicing welding to make joints. Making small articles like garden fork, supporting Stands, frames etc.
Brazing - Introduction, Tools handling
Soldering - Introduction, Tools, practice soldering using Soldering iron.
- 1.2.6 Mechanical properties of metals and alloys - Study of different mechanical properties of metals and alloys like tensile strength malleability etc ...Heat treatment processes - Nitriding , annealing, normalizing, tempering hardening

Unit 3 - Electrical Engineering (80 periods)

- 1.3.1 Electricity, Basic Concepts of electricity,
- 1.3.2 Faraday's laws of electro Magnetic Induction,
- 1.3.3 Ohm's law, Voltage, Current, AC and DC, Resistance
- 1.3.4 Flemings Rule
- 1.3.5 Electric Circuits, Different Types of circuits- Parallel and Series
- 1.3.6 Use of ammeter, Voltmeter Measurement of Resistances.
- 1.3.7 Simple wiring practice, gauges of electrical cables .



1.3.8 Generators, Concepts, Different types, working, Field visit.

1.3.9 Transformer - Basic concept, different types, working.

Unit 4 - Renewable Energy resources (60 periods)

1.4.1 Work, power and Energy Introduction to Newton's laws of motion, Concepts - force, work, power and energy, Calculation of energy.

1.4.2 Energy Resources - Introduction, Classification, Renewable and Non Renewable- Solar, wind and Bio Energy and other Resources.

1.4.3 Solar energy, Solar Voltaic, Solar Thermal Devices like Dryers and Solar cooker.

1.4.4 Biogas plants--Study of different types, production of energy from bio waste.-fabrication of models

Unit.5 - Engineering Graphics (30 periods)

1.5.1 Drawing instruments and uses

1.5.2 Lines - Different types and its applications

1.5.3 Lettering and numbering

1.5.4 Dimensioning

1.5.5 Construction of basic shapes-polygon, conic section, spiral curve

1.5.6 Introduction of projection of points, lines, planes

1.5.7 Quadrants and objects in different quadrants

1.5.8 Basic section views

1.5.9 Auxiliary views

1.5.10 Isometric views

1.5.11 Introduction to machine drawing

Module 2

Heat Engines And Farm Power (340 Periods)

Unit 1 - Heat Engine (50 periods)

2.1.1 Thermodynamic System process and cycles.

2.1.2 Engine cycles- Otto and diesel cycles

2.1.3 Introduction to Heat Engines and Classification -IC, EC, SI, CI

2.1.4 Engine parts, functions and materials of construction

2.1.5 Principle and working of SI and CI engines

2.1.6 Performance characteristics of an engine- BHP, IHP, IMEP and efficiencies

2.1.7 Rating of fuels, lubrication system, fuel injection, spark plug

2.1.8 Cooling system Air and water

2.1.9 Modern Engines and parts

Unit 2 - Farm Motors (60 periods)

2.2.1 Introduction, working, principle

2.2.2 D.C motor- Introduction, parts, working

- 2.2.3 A.C motor- Introduction, parts, working
- 2.2.4 Single phase motor-Introduction, parts, working
- 2.2.5 2 phase motor-Introduction, parts, working
- 2.2.6 3 phase motor-Introduction, parts, working
- 2.2.7 Selection of motors-Domestic and industrial purpose
- 2.2.8 Installation, maintenance, and servicing of D.C motor
- 2.2.9 Installation, maintenance, and servicing of A.C motor
- 2.2.10 Identify the complaints and repairing motors

Unit 3 - Power Tiller (70 periods)

- 2.3.1 Concept-Types of tillers-time, power and money saver
Different models, engine specifications, use of power tiller for different works
- 2.3.2 Parts of a power tiller-Functions, material of construction
- 2.3.3 Starting procedure-operating the tiller on road with and without trailer.
- 2.3.4 Clutch and gear system, Side clutches and break system
- 2.3.5 Power tiller attachments Rotovator, hitching practicing, tilling in field for seed bed preparation.
- 2.3.6 Other uses of P/T-Utilizing engine power of power tiller to operate irrigation pumps, winnowers, thresher, milling M/C etc.
- 2.3.7 Garden tiller

Unit 4 - Tractor (70 periods)

- 2.4.1 Tractor-Introduction, different types, models, Classification
- 2.4.2 Transmission system
- 2.4.3 Differential
- 2.4.4 Cooling system
- 2.4.5 Lubrication
- 2.4.6 Steering mechanism
- 2.4.7 Break system
- 2.4.8 Self starter, battery, ignition
- 2.4.9 Tyres and PTO shaft
- 2.4.10 Hitching-Different methods, practicing
- 2.4.11 Cage wheel fitting
- 2.4.12 Driving practice
- 2.4.13 Operation in field using cultivator, rotovator and cage wheel.



AQUACULTURE

Module I

AQUACULTURE FARM MANAGEMENT

- 1.1 Morphology of Teleost fish.
 - Observation and identification
 - Biology of Teleost Fish
- 1.2 Morphology of Penaeid shrimp.
 - Observation and identification
 - Biology of Shrimp
- 1.3 Physico-chemical & Biological Parameters of Water
 - Physical parameters of water
 - Chemical parameters of water
 - Biological parameters of water and familiarization of aquatic organisms
- 1.4 Aquatic Food Web
 - Aquatic food webs and pond ecology
- 1.5 Site selection, design & construction of fish farms
 - Criteria for Site Selection
 - Aqua farms design
 - Legislation
- 1.6 Components and Accessories of an Aquafarm
 - Farm Components
 - Farm Accessories
- 1.7 Management of aqua farms
 - Pre stocking management
 - Process of stocking
 - Post stocking management
 - Harvesting of fish
- 1.8 Familiarization of different aquaculture systems
 - Pond culture
 - Pen culture
 - Cage culture
 - Traditional farming systems
 - Recirculatory aquaculture systems

Module 2

- 2.1 Culture of Carps
- 2.2 Culture of Shrimps
- 2.3 Culture of Fresh Water Prawn
- 2.4 Culture of Genetically Improved Farmed Tilapia (GIFT)
- 2.5 Culture of Pearl Spot
- 2.6 Culture of Sea Bass
- 2.7 Culture of Mullet and Milk Fish
- 2.8 Culture of Air breathing fishes
- 2.9 Culture of Mud Crab
- 2.10 Culture of Mussels
- 2.11 New candidate species in aquaculture
- 2.12 Integrated Multitrophic aquaculture (IMTA)

AUTOMOBILE TECHNOLOGY

MODULE 1 - AUTOMOTIVE CHASSIS

UNIT 1.1 Introduction to Automobiles

Definition of Automobile-History of Automobile-Classification of Automobile-Purpose, Capacity, Fuel used, Number of wheels, Drive of vehicle-Technical Specification of Vehicle

UNIT 1.2 Engineering Drawing

Drawing standards- Lettering and Numbering-Dimensioning-Projection of Points-Projection of Lines-Projection of Planes-Orthographic Projection of Objects-Sectional views-Isometric views

UNIT 1.3 Chassis and Suspension

Layout of Automobile-Basic idea of Automobile systems-Types of Chassis frame and body-Monocoque Structure Tube, Channels and Box-Need and functions of suspension system-Sprung & Unsprung Weight-Classification of Suspension system-Rigid axle -Independent suspension construction and working of McPherson strut- suspension system construction and working of wishbone type suspension system-construction and working of Air suspension-Different types of springs-Leaf spring with helper spring-Coil spring-Torsion bars-Dampers/Shock Absorbers-Classification and Working of Dampers-Pitching, Bouncing and Rolling-Stabilizer bar (Anti-Roll Bar)

UNIT 1.4 Front Axles and Steering

Live axle and Dead axle-Stub Axles-Classification-Elliot, Reverse Elliot and Lemoine-Construction of Reverse Elliot Type-Steering Geometry- Camber, Caster angle, King pin inclination, Toe-in, Toe- out-Study of steering components-steering wheels, steering column, steering Gearbox, tie-rod, track rod arm, steering knuckle, pitman arm ,drag link-Steering gearbox-Construction and working of Rack and Pinion. Steering gearbox- construction and working of Recirculating ball type-Steering gear ratio-Power steering -Hydraulic Power steering, Linkage type power steering , Integral power steering-familiarization of Electronic power steering-Wheel Alignment and Wheel Balancing

UNIT 1.5 Wheels and Tyres

Function of Wheels & tyres-Types of wheels, Wire wheel, Disc wheel, Alloy wheels-Types of tyres, Tubed Tyres, Tubeless tyre-Constructional details of tyres &Comparison, Tubed, Tubeless tyres, Bias ply Radial ply, Merits and demerits-Specification of wheels and tyres-Tyre designation-Over inflation and Under inflation of tyres -Tyre Defects and remedies

UNIT 1.6 Brakes

Functions and Necessity of Brakes-Classification of Brakes-Purpose, Construction, Method of Actuation, Location, Extra Braking Effort-Construction and working of Drum brakes-Types of Disc brake-fixed caliper type, sliding caliper type, swinging caliper type-layout and working of Hydraulic Brake System-Construction and working of Tandem master cylinder-Construction and working of Wheel cylinder-Vacuum Booster- Layout and working of Air Brake-Construction and working of Brake valve-Construction and working of Brake chamber-Brake fluid-Function of Proportionating valve-Advanced brake systems

Concept of ABS (Anti-Lock Brake System) & EBD (Electronic Brake Distribution)

MODULE 2 - AUTOMOTIVE ENGINES

UNIT2.1 Engine fundamentals

IC engine and EC engines-Classification of IC engine-Spark Ignition, Compression Ignition-Engine Terminology-TDC, BDC, Stroke, Bore, Clearance volume, Piston displacement, Compression ratio, Engine capacity, Indicated Horse Power, Brake Horse Power, Frictional Horse Power, Mean Effective Pressure, Mechanical efficiency, Thermal efficiency, Volumetric efficiency-Working of 2 stroke petrol engine-Working of 4 stroke Petrol engine-Working of 4 stroke Diesel engine-Comparison between 2 stroke and 4 stroke Petrol engine-Comparison between Petrol and Diesel engines

UNIT 2.2 Engine constructions

Cylinder block-Cylinder head-Oil sump-Cylinder liner-Wet liner ,Dry liner-Gaskets-Manifolds-Inlet manifolds, Exhaust manifolds-Mufflers-Piston assembly-Piston, Piston rings, Gudgeon pin-Piston clearance-Gudgeon pin connecting methods-Full floating, Semi floating ,stationery-Connecting rod-Crank shaft-Fly wheel-Ring gear-

Cam shaft-Timing gears, Timing sprocket and chains, Timing pulley and belts-Engine Bearings-Main bearings, Thrust bearing -Valve -Side valve mechanism -Overhead valve mechanism-Valve clearance -Single Over Head Camshaft& Double Over Head Camshaft Mechanisms-Variable Valve Timing mechanisms

UNIT 2.3 Petrol Fuel systems

Types of fuel system-Gravity feed system, Pressure feed system-Layout and working of pressure feed system-Air cleaner, Fuel tank, Fuel filter, Fuel pump, Carburetor, Fuel gauge-Construction and working of Air cleaners-Dry type air cleaners, Oil bath type air cleaners-Types of fuel pumps-mechanical , electrical -Construction and working of electrical fuel pump-Fuel filters-cartridge type fuel filters-Working of simple carburetor-Air fuel ratio-rich mixture, lean mixture, stoichiometric-Layout and working of Multi Point Fuel Injection system (MPFI)-Function of ECU-Name and functions of Sensors



UNIT 2.4 Diesel Fuel system

Layout and working of Individual pump system-working of Distributor type injection pump-Working of Common rail direct injection system (CRDI)-Components of diesel fuel system-Injectors, Nozzles-diesel fuel filters-Governors (concept only)-Mechanical, Pneumatic, Electronic-Glow plugs and De-compressors-Alternate fuel vehicles-LPG, CNG, Electric, Hybrid cars-Turbocharger

UNIT 2.5 Cooling Systems

Necessity and methods of cooling system-Air Cooling, Liquid Cooling-Functions of cooling system-Working of Air cooling system-Working of Pump circulation system-Cooling system components- construction, working and function of Radiator, water pump, Thermostat valve, Pressure cap, Expansion reservoir, Cooling fan-Troubles and remedies of cooling system-Coolant-Additives, Anti-Freeze solution

UNIT 2.6 Lubrication Systems

Necessity and functions of Lubrication system-Grading of Lubricants-SAE grade-Types of lubricating system-petrol system, Splash system, pressure system, Dry Sump System-Working of pressure feed lubrication system-Components of Lubrication system-Oil strainer, Oil pump, Oil filter, Oil gallery -Construction and working of Rotor type oil pump-Oil filtering methods-Full flow system, Bypass flow system.

BANKING & INSURANCE SERVICES

Module I - Banking Services

Unit 1 Fundamentals of banking

Meaning and Importance of Banking
Types of Banks
Banking Regulation Act 1949
Important Provisions of the Banking Regulation Act
RBI and its functions

Unit 2 Functions of Commercial banks

Accepting Deposits
Lending of Funds
Agency services
General Utility Services
Procedure of opening and operation of bank Accounts
Principles of sound lending

Unit 3 Advances and Securities

Specific Loan
Priority sector advances
Security for advances
Types of Securities
Method of creating charges on securities

Unit 4 Banker and Customer

Meaning and concept of relationship between banker and customer
Type of customer
Innovative Banking services

Unit 5 Negotiable instruments

Meaning and type of Negotiable Instruments
Endorsement

Unit 6 Accounting

Accounting



MODULE 2

COMPUTER APPLICATION

Unit 1 Information technology

Introduction to Information Technology - Data processing - Data presented inside a computer - Characteristics of computers - History of computers - Evolution of computers - Classification of computers - Hard wired programming and stored program concept - Computer Organisation - Computer as a data processing machine - Basic computer operations - Functional units - System components - Input/Output ports (I/O ports) - Microprocessor - The Memory - Memory organisation - Types of memory - Advanced portable storage devices - Memory hierarchy - Input /Output Devices - Computer Software - Software - Classification of software - Malicious Software - Copyright - Software piracy Licensing - Free software philosophy - Application of information Technology - Communication - Business - Medicine and Health care - Entertainment - E-Governance - Education - Engineering manufacturing - Science - IT policy in Kerala state - E-commerce - M-commerce - Online trading - Net-Banking

Unit 2 Computer hardware and operating system

Components of a Personal Computer - Parts of a personal computer - Booting - BIOS - POST - Disk Operating System - Windows 7 OS - Basic file and folder operations - Accessories - Installing and Managing Windows 7 - Steps to install Windows 7 - Hard drive preparation - Formatting - Device Driver - Installing a printer driver - Changing file views in windows7 - Control panel - User creation and rights - Trouble shooting - Creating start-up disk - Sharing files - Internet connection and Firewall - Windows Explorer- Installing MS office- Installing DTP software - Installing Tally - Maintaining Computer Software - Transferring computer data - Maintaining computer software.

Unit 3 Office Automation

Office Automation basics - Concept of office - Nature of work in office - Need for office automation - MS Word - User interface of MS word - Creating a document - MS Excel - Starting MS Excel - User interface of MS Excel - The work sheet - Formula - Sorting - Working with chart - MS Power point - Creating presentation indifferent ways - Inserting a new slide - Adding themes - Saving a presentation - Set up the show - MS Access -Advantages of DBMS - Data Models - Terminologies used in RBDMS - MS Access - Creating a query in the query design option - Creating a form using Form wizard - Reports - Import - MS Outlook

Unit 4 Linux and Open Office

Introduction to Linux -History of Linux - Advantages of GNU Linux - Linux file system structure - Linux Kernel - Login and logout in Linux - Linux command - Open Office writer - Introduction to Open office - Apache Open Office - System requirement Starting Open Office Writer - Advanced features of Open Office

Writer - Character Formatting - Background Colour - Paragraph Formatting - Bullets and Numbering - Indents - Creating an index of a document - Open office calc - Selecting cells - Cell formatting - Inserting Rows/Columns - Built in functions - Charts in Calc - Addressing Cells - Data Range - Work sheet - Auto fill - Filter - Data Sorting - Totals and sub totals - Protection - Open office impress - Important features of impress - Bringing different objects into slides - Adding Text - Different views - Adding New Slides to Your Presentation - Background - Slide Transition - Animating objects in a slide - Watching slide show.

Unit 5 Internet and Malayalam Computing

Introduction Computer Networks - LAN Topologies - Protocols - Connectivity devices - Windows 7 Firewall Settings - Internet and Email - History of the Internet - Connecting Computer to Internet Connection - World Wide Web (WWW) - Web Browser - Search Engines - Email (Electronic mail) - Creating and using free email account with Gmail - Types of Internet Web page Designing - HTML - Starting with HTML - Attributes of <HTML> tag

Malayalam Computing - Malayalam through Computers - Free Software and Language Computing - Malayalam and Technology - Malayalam digital Technology - Unicode - Malayalam Using Transliteration - Malayalam Word Processing - Downloading and Installing Malayalam Fonts - Installing Fonts in Windows - How to enable Malayalam in Web Browsers? - Malayalam in UBUNTU - Malayalam keyboard and Typing - Ethical and Social Issues in Information Systems.



BASIC NURSING AND PALLIATIVE CARE

MODULE 1:

INTRODUCTION TO BASIC NURSING AND FIRST AID (340 Periods)

1.1 INTRODUCTION TO NURSING (20 Periods)

Health, Illness and Health Care Delivery System

- Health
- Illness
- Health Care Delivery System - Hospitals, primary care centres, ambulatory care centres and clinics, home health care, long term care facilities, specialized care centres and settings

Hospital

- Hospital
- Types
- Roles and functions of hospital
- Major departments
- Health Team
- Patient

Introduction to Nursing

- Brief history
- Definition
- Qualities of a nurse
- Roles of a nurse
- Scope of nursing
- Etiquettes of a nurse
- Ethics
- Communication
 - Concept and types of communication
 - Importance of communication
 - Essentials of communication process
 - Essentials of good communication
 - Barriers of communication
 - Interpersonal relationship (IPR)
 - Concept of IPR
 - Principles of IPR

Introduction to Nursing Process

Overview of Nursing Process - Assessment, Planning, Implementation, Evaluation

Nursing Care Plan

1.2 ANATOMY AND PHYSIOLOGY (50 Periods)

Introduction to Anatomy and Physiology

- Definition of terms - Anatomy, Physiology
- Language of Anatomy - Anatomical position - Medial and Lateral, Internal and External, Superficial and Deep, Anterior and Posterior, Proximal and Distal
 - Cell - structure and function, Tissues - Type, location and function, Membranes - Types and functions, Glands - Types and functions
 - Body cavities- boundaries and contents
 - Blood
 - Composition of Blood
 - Functions of blood
 - Coagulation of blood
 - Blood groups
 - Blood Disorders(Haematologic Diseases) - Anaemia, Leukemias, Hemophilia, Thrombocytopenia, Erythroblastosis Faetalis

The Musculoskeletal System

- Bones
 - Functions
 - Classification
- Axial Skeleton - Skull, Vertebral column, Thoracic Cage
- Appendicular Skeleton - Pectoral Girdle and Pelvic Girdle
- Joints- classification and function
- Location of important muscles of the body -Deltoid, Biceps, Triceps, Quadriceps, Gluteal, VastusLateralis
- Disorders of Musculoskeletal System - Myasthenia gravis, muscular dystrophy, tetany, arthritis, osteoporosis and gout
- Body Mechanics
 - Definition
 - Purposes
 - Importance
 - Principles of body mechanics
 - Complications of improper body mechanics

The Cardiovascular System

- Heart
 - Position
 - Structure
 - Conducting System
 - Functions



Cardiac cycle
 Electrocardiograph(ECG)
 Heart sounds
 Pulse
 Blood Pressure
 Blood supply to heart
 Circulation of blood
 Pulmonary circulation
 Systemic Circulation

- Blood Vessels - Arteries, Arterioles, Vein, Venules
- Lymphatic System - Lymph, Lymphatic Circulation, Lymph nodes and Spleen
- Disorders of Cardiovascular system - Hypertension, Angina pectoris, Coronary artery disease, Heart failure

The Respiratory System

- Respiratory Organs - Nose, Pharynx, Trachea, Bronchi, Bronchioles, Alveoli, Lungs - Structure and functions
- Respiratory Muscles - Inter costal muscles, Diaphragm
- Mechanism of Respiration - Inspiration , Expiration, Pause
- Respiratory volume and capacities
- Disorders of respiratory system - Asthma, Emphysema, Occupational respiratory disorders

The Endocrine System

- Endocrine glands
- Pituitary gland- Parts, hormones and functions
- Thyroid gland - Structure, hormones and functions.
- Parathyroid glands - Hormones and functions
- Adrenal glands - Parts , hormones and functions
- Pancreas - Structure, hormones and functions
- Pineal body and Thymus glands hormones and function
- Ovaries and Testes - Hormones and function
- Disorders of Endocrine System- Gigantism, Dwarfism, Diabetes Insipidus, Hypothyroidism, Hyperthyroidism, Cushings Syndrome, Addison's Disease, Diabetes Mellitus

The Digestive System

- Alimentary Canal - Parts, Structure and Role
 Mouth, Tongue, Teeth, Pharynx, Oesophagus, Stomach, Small Intestine, Large Intestine, Rectum, Anal Canal
- Digestive Glands - Structure and function - Salivary glands, Gastric glands, Liver, Pancreas and Intestinal glands

- Digestion of food
- Absorption of digested products
- Disorders of Digestive system - Anorexia, Nausea, Vomiting , Hiccups, Appendicitis, Constipation, Diarrhoea, Malena, Jaundice

The Nervous System

- Neuron
- Brain
- Meninges
- Cerebrospinal fluid (CSF)
- Cranial Nerves
- Spinal Cord
- Lumbar puncture
- Disorders of Nervous system- Hydrocephalus, Dementia, Meningitis, Stroke

The Sensory Organs

- Structure and functions of Eye
Disorders - Myopia, Hypermetropia, Cataract, Conjunctivitis, Stye
- Structure and functions of Ear
Disorders - Otitis media
- Structure and functions of Skin
Disorders - Acne Vulgaris, Dermatitis or Eczema, Albinism, Scabies, Vitiligo, Sebaceous cyst
- Structure and functions of Tongue
Disorders - Glossitis
- Structure and functions of Nose
Disorders - Epistaxis, Rhinorrhea,

The Urinary System

- Structure and functions - Kidney, Ureters, Urinary bladder and Urethra
- Structure and functions of nephron
- Urine Formation
- Micturition
- Terms - Anuria, Oliguria, Polyuria, Dysuria, Haematuria, Proteinuria, Glycosuria

The Reproductive System

- Male reproductive system
Structure and function of scrotum, testes, epididymis and vas deferens, spermatic cord, seminal vesicles, prostate glands and penis
- Female reproductive system
Structure and function of - vulva, vagina, uterus, uterine tubes and ovaries
Menstruation



- Terms - Menarche, Amenorrhea, Dysmenorrhea, Menorrhagia, Menopause, Infertility.

1.3 MICROBIOLOGY (20 Periods)

Microbiology

- Microbiology - Brief History and Definition
- Characteristics of Micro organisms
- Taxonomic groups - Bacteria, Virus, Fungi, Protozoa and Algae
- Factors influencing growth of micro organism
- Uses of micro organism
- Common diseases caused by pathogenic micro organisms

Infections

- Infections - definition, Incubation period, period of communicability, sources of infection, Cross infection, health care associated infection, prevention of health care associated infection (HAI)
- Infection process cycle - Infectious agent, reservoir, portal of exit, mode of transmission, portal of entry, susceptible host

Disinfection and Sterilization

- Concept of disinfection and sterilization
- Methods
Disinfection: Boiling, chemical disinfectants, antiseptics and cleansing agents
Sterilization -
- a) Physical Methods- dry heat, moist heat, filtration and radiation.
- b) Chemical Methods - alcohols, aldehydes, dyes, halogens, phenols, gases
- Disinfection of wards
- Disinfection of operation theatre

Immunity

- Types - Innate, active and passive
- Vaccines
- National Immunization schedule

Bio-Safety and Waste Management

- Introduction to biomedical waste
- Importance to biomedical waste
- Generation and segregation of waste
- Collection and storage of waste
- Transportation of waste
- Treatment of Waste
- Disposal of Waste

1.4 MEDICAL AND SURGICAL ASEPSIS (40 Periods)

Medical and Surgical Asepsis

- Concept of Asepsis- Medical and Surgical Asepsis
- Medical aseptic practices
 - Medical hand hygiene
 - Donning of gown
 - Face masks
 - Wearing and removing clean gloves
 - Personal protective equipments
- Surgical aseptic practices
 - Principles of surgical asepsis
 - Surgical hand washing
 - Sterile gloving
 - Opening sterile package
 - Pouring of sterile solutions

Standard Precautions and Isolation Techniques

- Standard precaution
- Transmission based precaution
 - Airborne precaution
 - Droplet precaution
 - Contact precaution
 - Isolation technique - Barrier Nursing, Reverse Barrier Nursing

Cleaning of Instruments and Articles

- Cleaning of instruments including sharps
- Care of Rubber items
 - Mackintosh
 - Rubber tubes and catheters,
 - Hot water Bag, ice Caps and air cushion
 - Gloves
 - Rubber air/water mattress and pillows
 - Ambu bag with face mask
 - Aquathermia pads
- Care of Glass items
- Care of Medical Equipments
- Care of Stainless steel items
- Care of Plastic and Poly Vinyl Chloride Items
- Care of Enamel wares
- Care of Linen
- Care of Blankets

1.5 INTRODUCTION TO PSYCHOLOGY AND SOCIOLOGY (10 Periods)

Psychology



- Definition of Psychology
- Psychology - Importance in nursing
- Mental health-
- Definition
- Characteristics of a mentally healthy person
- Emotions
- Emotional reaction to diseases
- Defense mechanisms
- Personality

Sociology

- Definition of Sociology
- Sociology- Importance in nursing
- Influence of culture on health and disease.
- Family, marriage and their influence on health and health practices
- Effects of illness on family
- Social problems - Poverty, unemployment, illiteracy, housing, food, prostitution, substance abuse, child labor, child abuse, rights of Children, Problems of women, elderly and handicapped, Crime and juvenile delinquency, HIV/AIDS

1.6 PATIENT CARE UNIT (40 Periods)

Maintenance of Patient Unit

- Patient Unit - definition
- Common articles/equipments
- Purposes of maintenance of patient unit
- Patient safety
- Taking care of patient's unit
- Bed making
- Definition
- Purposes
- Types
- Procedure - Open bed, Closed bed and Occupied bed

Providing Comfort Devices and Positions

Comfort devices

- Bed cradle
- Bed blocks
- Back rest
- Air cushion
- Cotton rings
- Foot board

Pillows
 Sponge rubber pad
 Doughnuts/heel and elbow rings
 Wedge pillow
 Trochanter roll
 Sand bags
 Cardiac table

- Positions
- Supine
- Dorsal recumbent
- Lateral or side- lying position
- Prone position
- Fowler's position
- Trendelenberg
- Lithotomy

1.7 FIRST AID AND EMERGENCY CARE (160 Periods)

First Aid and Emergency Care

- First Aid
- Aims and objectives of first aid
- Principles of first aid
- Qualities of a first aider
- Golden rules of first aid
- First aid box

Action at an Emergency

- First aid at an emergency
- Telephoning for help
- Multiple casualties
- Road accidents
- Fires
- Electrical injuries
- Rescue from drowning
- Stress

Basic Life Support (BLS)

- - Adult BLS
 - Chest compression
 - Airway
 - Breathing
 - Automated External Defibrillator (AED)



- Demonstration of AED use
- Child & infant BLS
- One rescuer CPR sequence
- Choking
 - Adult choking
 - Infant choking
- Two rescuer CPR sequence
- Recovery position

Wounds and Haemorrhage

- Wound
- Type of wounds
- Wound with foreign body
- First Aid for wounds
- Types of haemorrhage
- Epistaxis
- First aid for Haemorrhage and Epistaxis

Fractures

- Causes
- Types
- Classification
- Signs and symptoms
- First aid for Fracture

Poisoning

- Routes of taking poisons
- General Signs and symptoms
- First Aid for
- Acid poisoning
- Alkali poisoning
 - Common Indian plant poisons - Castor oil plant, Yellow oleander, Datura, Abrus seed (kunnikuru), Nux vomica, Cannabis, Atropa Belladonna, Tobacco, Opium, Poisonous mushroom, Cerbera odollam (Suicide tree)
 - Drugs - Phenobarbitone
 - Metal poisoning
 - Organic chemical poisons
 - Food poisoning

Medical Emergencies

- First aid in Medical emergencies
 - Shock

- Stroke
- Drowning
- Asphyxia
- Heat and sun stroke
- Epilepsy
- Abdominal pain

Burns and Scalds

- Assessing a burn
- Minor burns and scalds
- Severe burns and scalds
- Special types of burns - burns to the airway, electrical burns, chemical burns, chemical burns to eye and sun burn
- First aid in burns and scalds

Bites and Stings

First Aid for

- Animal Bites
- Insect bites
- Snake bites

Foreign bodies

First Aid for

- Foreign bodies in skin
- Foreign bodies in eye
- Foreign bodies in ears
- Foreign bodies in nose
- Swallowed foreign bodies
- Foreign body aspiration
- Inhaled foreign bodies

Bandaging, Splints and Slings

- Bandaging
- Purposes
- Types - Roller and Triangular
- Principles of bandaging
- Techniques - Simple spiral, Reverse spiral, Figure of eight, Spica
- Splints and Slings

Handling and Transport

- Handling and transport of casualties
- Manual moves
- Moves using equipment
- Stretchers



MODULE. 2 BASIC NURSING PROCEDURES (340 Periods)

2.1 ADMISSION AND DISCHARGE PROCEDURES (10 Periods)

Admission and Discharge Procedures

- Admission of patient
- Discharge of patient
- Physical assessment
- Assisting in examination

2.2 DOCUMENTATION (10 Periods)

Documentation

- Purpose and Importance
- Principles of documentation
- 1 Types of documents

2.3 LIFTING, SHIFTING AND TRANSFERRING PATIENTS (25 periods)

Lifting, Shifting and Transferring Patients

- General guidelines and principles of lifting, shifting and transferring
- Moving the helpless patient up in bed (two nurses assist patient)
- Helping the patient to move from one side of bed to the other (one nurse assists)
- Helping the patient turn on his side (one nurse assists)
- Log rolling
- Lifting a semi-helpless patient up in bed (patient can help by pushing with his feet one nurse assists the patient)
- Moving an injured part
- Transferring the patient from bed to stretcher and stretcher to bed
- Transferring the patient from bed to wheel chair and wheel chair to bed

2.4 EXERCISE, REST AND SLEEP (15 Periods)

Exercise

- Importance of Exercises
- Active and passive exercises
- Range of motion exercises
- Breathing exercises

Rest and Sleep

- Beneficial effects of Rest and sleep
- Measures to promote rest and sleep

2.5 VITAL SIGNS (65 Periods)

Vital Signs

- Definition
- Importance

Body Temperature

- Definition
- Factors influencing body temperature
- Thermometer & types
- Sites of taking body temperature
- Measuring body temperature
- Care of patients with fever
- Terms- hypothermia, hyperthermia

Pulse

- Definition
- Characteristics
- Factors influencing pulse
- Sites of taking pulse
- Assessment of pulse
- Terms - bradycardia, tachycardia, arrhythmia, weak/thready pulse

Respiration

- Definition
- Characteristics
- Factors influencing respiration
- Assessing Respiration
- Terms- Eupnoea, tachypnoea, bradypnoea, apnoea, orthopnoea, dyspnoea, cyanosis, anoxia, hypoxia hypoxemia,
- Care of patients with dyspnoea

Blood Pressure

- Definition
- Factors influencing blood pressure
- Instruments - sphygmomanometer and stethoscope (types and parts)
- Measurement of blood pressure
- Terms - systolic and diastolic pressure, hyper tension and hypotension

2.6 PERSONAL HYGIENE (80 Periods)

Oral Hygiene

- Problems of neglected mouth,
- Assisting a patient for oral hygiene,
- Mouth care for unconscious patient
- Care of dentures

Care of Skin

- Importance of skin care
- Instructions for skin care
- Helping with bathing
- Giving a bed bath



- Grooming and dressing

Pressure Sores

- Definition
- Causes
- Signs and symptoms
- Stages of pressure sores
- Areas prone to develop pressure sores in various positions
- Risk factors of pressure sores
- Prevention of pressure sores
- Back care/rub

Care of Eyes, Nails, Feet and Hair

- Care of eyes
- Care of nails
- Care of feet
- Care of hair -
- Combing and brushing
- Hair wash/shampooing,
- Pediculosis treatment

Care of Perineum

- Perineal care - male and female

2.7 MEETING THE NUTRITIONAL NEEDS (30 Periods)**Nutrition**

- Importance of nutrition in health and illness
- Factors affecting nutritional status and appetite
- Therapeutic diet -
- Diet modification - modification in consistency, modification in nutrient content
- Diet in diabetes mellitus, hypertension, renal diseases, peptic ulcer

2.8 ASSISTING THE ELIMINATION NEEDS (35 Periods)**Assisting in Elimination Needs**

- Care of patients with retention of urine
- Offering and removing of bed pan
- Intake output chart
- Indwelling Catheter care
- Applying a condom catheter
- Care of patients with Constipation
- Rectal Suppositories
- Enema
- Administering a Cleansing Enema - soap and water enema and commercially

available enemas

2.9 HOT AND COLD APPLICATIONS (40 Periods)

Hot and Cold Applications

- Classification
- Effects of applying heat
- Effects of applying cold
- Principles
- General instructions
- Application of heat
 - Hot water bag
 - Hot fomentation
 - Sitz bath
 - Steam inhalation
- Application of cold
 - Ice cap
 - Tepid sponge

2.10 COLLECTION OF SPECIMEN (30 Periods)

- Specimen
- General instructions
- Collection of specimen - urine, sputum, stool
- Urinalysis - Sugar, albumin, acetone, bile salts, bile pigments (conventional and urine strip method)



BIOMEDICAL EQUIPMENT TECHNOLOGY

Module 1

1.1 Basic Electronics

1.1.1 Basic Electricity

Voltage - Definition, Unit, Current - Definition, Unit, Resistance - Definition, Unit, Relationship between V, I and R (Ohm' Law)

1.1.2 Electronic Components

Resistor - Resistance - Unit -Laws of resistance - Series and Parallel connections - Uses, Capacitor - Capacitance - equation of Capacitance - Unit - Uses, Inductor - Inductance - Unit - Uses, Diode - Semiconductor - Doping - PN Junction - PN Junction diode - Biasing - Applications, Transistor - Basic structure - Types - Applications, FET - Basic structure - Types , MOSFET - Basic structure, IC - Basic concept - idea about types of integration

1.1.3 Rectifiers

Half wave Rectifier - Circuit - working - output wave, Full wave Rectifier - types - circuit - working - output wave, Filter circuits - Concept and need of filtering - type - circuits - ripple factor

1.1.4 Amplifiers

Amplification - Gain - Frequency response - Band width, OP Amplifiers - Basic concept - Types - Circuit - working, Instrumentation Amplifier - Circuit - working - CMRR -Advantages - Applications

1.2 Measuring Instruments

1.2.1 Measuring Instruments

Multimeter - Digital and Analog Multimeter - Uses, Cathode Ray Oscilloscope - CRT - Introduction to Digital and Storage C R O - Uses, Safety Analysers - Basic modules -Types - Uses

1.3 Biomedical Recording System

1.3.1 Bioelectric Potentials

Cell membrane - Resting membrane potential, Action potential - Depolarisation - Repolarisation

1.3.2 Transducers

Defenition - Classification , Pressure transducer - working - examples and Uses, Temperature transducer - Functioning - examples and uses, Piezo electric transducer - Basic principle - examples and uses

1.3.3 Biomedical Recording system

Electrodes - Block Diagram -working

1.4 Health care Delivery system

1.4.1 Levels of Imparting Health care delivery system

Functions of a Hospital, Primary (PHC, CHC) - Level of Services, Secondary (District Hospitals) - Level of Services, Tertiary (Medical colleges)- Level of services

1.4.2 Important department in a hospital

Name and functions of various departments in Hospitals

1.5 Power distribution in a hospital

1.5.1 Transformers

Mutual Induction - Types of transformers - Step Up , Step Down, E H T and Power Transformers - Functions, Single phase and three phase connections - Differences - Need - Merits and Demerits

1.5.2 Motor, Generator and Stepper Motor

Applications in Hospitals

1.5.3 Circuit Breakers (CB)

Molded case CB (MCCB), Earth leakage CB (ECCB), Residual current CB (RCCB), Miniature CB (MCB) - Functions, Control Panel - Basic idea, UPS - Need - Functioning, Batteries used in Hospitals - Types - Uses

1.6 Computer applications in medical field and Embedded System

1.6.1 Computers in Medicine

Uses of computers in hospitals and Biomedical equipment

1.6.2 Introduction to Embedded System

Basic Architecture - types - applications of Embedded system in Biomedical Equipment

Module - 2

2.1 Electro Cardiology

2.1.1 Structure of Heart

Position of Heart - Structure of heart - - Conduction mechanism of heart - Electrical activity of heart - Electrocardiogram

2.1.2 ECG Lead System

Electrodes - Electrode placement - Bipolar Leads - Unipolar Leads, Recording of ECG

2.1.3 Modular block diagram of Modern ECG Machine

Analog to Digital Converter - Basic Blocks of Digital ECG Machine - Multi Channel ECG machine

2.1.4 Introduction to advanced Cardiology equipment

TMT, Holter Monitor, Echo Cardiology, Angiography - Basic Working - Functions

2.1.5 Clinical application of ECG



2.2 Blood pressure measurement

2.2.1 Indirect BP Measurement

Basic Physiology of BP - Stethoscope - Sphygmomanometer - Auscultatory Method - Digital BP apparatus - Importance of Mercury free BP measurement

2.2.2 Direct BP Measurement

Percutaneous Insertion, Catheterisation, Implantation - Basic idea - uses

2.2.3 Clinical relevance of BP measurement

2.3 Temperature Measurement

2.3.1 Mercury free Thermometers

Alcohol Thermometer - Basic principle - Advantages, Digital Thermometers - Basic Blocks - advantages

2.4 Specialised Equipment

2.4.1 Multi Parameter Monitor

Modular Block diagram - Working - Applications

2.4.2 Introduction to Specialised Equipment

Defibrillator - Basic blocks - Functions, Pacemaker - Parts - Types - Functions, Pulse Oximeter - Blocks - function, Catheterisation lab - Basic Idea - Functions

2.5 EEG

2.5.1 EEG

Basic Physiology of Brain, EEG Rhythms, Electrodes, Electrode placement system (10 - 20 system)

2.5.2 Modular block diagram of EEG Machine

Blocks of EEG Machine (Including software), Evoked potentials

2.5.3 Applications of EEG

2.6 EMG Machine

2.6.1 EMG

Basic details of muscular potential, EMG Electrodes, Modular block diagram of EMG Machine (including software)

2.6.2 Nerve Conduction Velocity (NCV) Measurement

Introduction to Stimulator - Functions, Nerve Conduction Velocity measurement

2.6.3 Clinical relevance of NCV studies in Clinical Neurology

CIVIL CONSTRUCTION TECHNOLOGY

MODULE I ADVANCED SURVEYING

Unit 1 Chain Surveying	25 periods
Chain Surveying	3 periods
Linear measurements (Chain/ Tape)	4 periods
Instruments used	3 periods
Ranging out survey lines (Direct method)	2 periods
Calculation of area (Triangulation only)	6 periods
Divide a given area into plots	3 periods
Read and locate position of a plot from litho map	4 periods
Unit 2 Levelling	37 periods
Instruments used	2 periods
Temporary adjustments	4 periods
Methods of levelling- Simple levelling & Differential levelling	5 periods
Reduction of levels (HI/ HC method only)	7 periods
Contouring - Contour Interval - Horizontal equivalent - Characteristics of contour lines - Uses - Locating contours - interpolation of contour lines	10 periods
Longitudinal sectioning and cross sectioning / Profile levelling	9 periods
Unit 3 Total Station & GPS	40 periods
Parts and accessories of total station	2 periods
On board calculation	3 periods
Field operation	5 periods
Errors and rectification	8 periods
Precautions to be taken for using total station	4 periods
Advantages of total station	2 periods
Uses of total station	2 periods
Global Positioning System (GPS) - method of using handheld GPS	9 periods
Practical - Advanced Surveying	
Unit 1 Chain Surveying	25periods
Familiarisation of chain survey instruments	
Preparation of site plan and computation of area of a given plot	
Preparation of site plan, computation of area, division into plots of suitable area with road access	

**Unit 2 Levelling****93 periods**

Study of instruments
 Temporary adjustments of Dumpy Level
 Taking reading from Staff
 Simple levelling
 Differential levelling
 Contouring - preparation of contour plan
 Longitudinal sectioning
 Cross sectioning

Unit 3 Total Station & GPS**120 periods**

Study of instruments
 Setting up of total station
 Measurement with total station
 Preparation of computer drawing
 Height and distance
 Calculation of area
 Verticality of a tower
 Measurement with handheld GPS

TOTAL- 340 periods**Module II****CIVIL CONSTRUCTION & DRAUGHTSMANSHIP****Unit 1 Building Materials****35 periods**

Stones:- qualities - uses - dressing 3 periods
 Bricks:- qualities, field tests, substitutes for brick (concrete block & interlocking bricks only) 10 periods
 Sand:- Sources - types - qualities - bulking 4 periods
 Cement:- Ingredients- field tests - types - grade 5 periods
 Timber:- seasoning, structure of tree - defects in timber - qualities 5 periods
 Steel:- Market forms (angles, channels, Tee, I, square bar, ribbed bar, MS, HYSD & TMT) - sizes - properties of mild steel and HYSD. 8 periods

Unit 2 Advanced Construction Materials**20 periods**

Plywood - laminated board - particle board - fibre board - gypsum board - rubber wood (treated) 8 periods
 Aluminium:- advantages - uses 3 periods
 Stainless steel 2 periods
 Glass:- forms 3 periods

Wall putty	2 periods
Ferro-cement	2 periods
Unit 3 Building Construction	47 periods
Types of buildings (List the names as in KMBR & KPBR only)	1 period
Parts of a building	1 period
Selection of site	1 period
Setting out of building	1 period
Foundation:-bearing capacity of soils - bearing capacities of different soils - methods of improving bearing capacity - types of foundation - shallow & deep foundations - open trench foundation (wall footing) - isolated footing - continuous footing - raft foundation - pile foundation (description only) - causes of failure of foundation.	4 periods
Masonry:- Stone Masonry: types- Ashlar fine only - random rubble - coursed rubble - dry rubble - masonry in cage (Gabbion)	4 periods
Brick masonry:- technical terms - bond - stretcher - header - arrises - bed - course - lap - closer - bat	4 periods
Types - English bond and Flemish bond - sketches (1 brick and 1 ½ brick thick walls only) - comparison of English bond and Femish bond.	5 periods
Doors, Windows & Ventilators:-- Doors:- Technical terms - types - framed and panelled - glazed - collapsible - revolving - rolling shutter - sliding - automatic sliding only	3 periods
Windows & Ventilators:- types - panelled & glazed - skylight - Common sizes of doors, windows & Ventilators	3 periods
Lintels & sunshades:- functions and construction details	1 period
Concrete:- PCC - Ingredients - qualities (brief description only) - water cement ratio - concrete mixing - types of mixing - ready mix concrete (RMC) - proportioning of concrete ,their strength and uses of M10 to M25 mixes - admixtures - different methods of curing	4 periods
RCC:-Ingredients - Supervision of concrete works	1 period
Cement Mortar:- Ingredients - proportion for different uses - Preparation	1 period
Vertical Transportation:-Stair - technical terms - types based on shape only - requirements of a good stair -ramp - lift - escalator (brief descriptions).	3 periods
Roof & roof Covering:-Types and suitability of roof - Types and uses of roof covering materials	2 periods
Flooring :-Types- choice of flooring - cement concrete - tile - timber - marble - granite - glass	1 period
Finishing works:-plastering - white washing - colour washing - distempering - painting (brief description only - methods of providing DPC - termite proofing - water proofing	4 periods
Cost-effective & eco-friendly building materials	2 periods
Repair & Maintenance of buildings:-Common building defects and their	



symptoms - rectifications 2 periods

Practical- Building Drafting & Construction

Engineering Graphics 30 periods

Drawing Standards

Lettering, Numbering and Dimensioning

Projection of Points

Projection of Lines

Projection of planes

Orthographic projection of objects

Sectional views

Auxiliary views

Isometric views

Drawing of building parts 30 periods

English bond and Flemish bond (1 brick and 1½ brick thick walls only) right angled corner to a height up to 1m, with elevation

Isolated footing

Panelled door

Lintel with sunshade

Dog legged stair-plan & section

Building Drawing 70 periods

Single roomed building (Hall)

Single bed roomed residential building

Two bed roomed building

Three bed roomed building

Two storeyed residential building with three bed rooms

Village office building

Commercial building

Computer Aided Drafting - 2D 70 periods

Introduction - commands

Preparation of drawings already specified in Building Drawing

Computer Aided Drafting - 3D 18 periods

One simple exercise only

Setting out a building 20 periods

Single bed roomed residential building

Two bed roomed building

Three bed roomed building

Total 340 periods

COMPUTER SCIENCE & INFORMATION TECHNOLOGY

Module 1 : Computer Hardware maintenance and Networking

Unit No. : 1.1- Computer Fundamentals

Role of computers, Characteristics of Computers, Evolution of Computers, Generations of Computer, Classification of computers, Organization of computers, Hardware Devices-(Input Devices, Output Devices, Memory Devices), Number system, Number conversion, Representation of: integer, floating point numbers, characters, Different coding schemes, software, Types of Software, Operating system, Functions of Operating system, Examples of operating system platforms-(WINDOWS, LINUX, MAC, Android), E-Waste Handling, Green computing

Unit No. : 1.2 - Computer Installation & Maintenance

PC assembling, Basic electronic components in a PC-(IC chip, Diode, Resistors, Transistors, Capacitors), Identifying major Components of a PC-(Motherboard, Processor, Cooling Fan, RAM, Hard disk, DVD Drive Switch Mode Power supply (SMPS)), Steps for assembling a PC, Attaching Input output devices, Lap top servicing, Software installation(Various types of OS installation), Trouble shooting

Unit No. : 1.3 - Network Configuration

Networking Concepts, Relevance of n/w, Needs of N/W, Types of N/W(LAN, MAN, WAN, Public N/w, Private N/w), Transmission Media-(Guided Media, Unguided Media), Networking Devices-(Modem, Switch, Hub, Router, NIC), N/W topology-(Bus, Star, Ring, Mesh, Hybrid), Networking Protocol-(TCP, UDP, FTP), IP addressing, IPV4/IPv6 addressing, IP address configuration, Subnet mask, Types of network configuration(Peer-Peer configuration, Client-Server Configuration), LAN configuration tools, Network Cables and connectors, Cable crimping and testing, Network interface devices(Ethernet card, Switch, Modem), Network configuration in windows OS, Network configuration in Linux OS, Trouble shooting

Unit No. : 1.4- Security System (CCTV) Configuration

Video Surveillance Systems, Selection of CCTV Camera, Indoor & Outdoor CCTV cameras, Peripherals used-(Switch, DVR/NVR, Cables, IP Cams), Types of Transmission Media, CCTV Installation, Initial CCTV configuration, Network configuration of CCTV, trouble shooting



Module 2

DTP, GRAPHIC DESIGNING AND VISUAL COMMUNICATION

Unit No. : 2.1 - Visual Communication

Introduction to Visual Communication, Need and importance of Visual Communication, Advantages & disadvantages of visual communication, Communication process, SMCR model of communication, Characteristics and functions of mass media communication, Types of visual aids, Applications of visual communications, Word processing package, Spread sheet package, Presentation package.

Unit No. : 2.2- DTP- Package

DTP package basics, Conventional Publishing and DTP, WYSIWYG, Document Planning, DTP working Environment, Editors, Layout Editor, Story Editor, Formatting Text, Changing Font, Aligning Text, Frames & Threads, Working with graphics, Style sheet, Applying style, Libraries, Working with column, Table, Master Pages, Creating master page, TOC & Index, Document Preparation - Malayalam, Different Malayalam typing software, ISM Malayalam software, Keyboard Layout, Steps for preparing document in ISM, Managing and Printing a Publication

Unit No. : 2.3 - CorelDraw

CorelDraw basic, Images, CorelDraw Working environment (Title Bar, Menu Bar, Standard Tool Bar, Work area and Printable Area), Property Bar, Drawing Basic Geometric Figures - (Freehand lines, Joining free hand line, Bezier lines, Ellipse and circle, Rectangle and squares, Polygons) Views, Tool box, Selecting objects, Adding Effects - (Perspective Effect, Extrusion, Drop Shadow, Distortion, Transparency), Working with Text, Text Tool, Formatting Text, Text Editor, Working with images - (Importing, Resizing, rotating and skewing, Cropping, Adding effects, 3D effects, Art stroke, Blur, Colour transform, Distort, Noise, Sharpen, Exporting files to another application), mini project - news paper creation

Unit No. : 2.4 - Graphics editing package

Photo editing software, Colour Modes, changing colour modes, Graphics editing package program window (Title Bar, Menu Bar, Image Window, Image Title Bar, Status bar, Rulers, Palette, Tool box), Working

with Image Selection Tools, Transforming selection, Drawing and retouching tools, Painting tools, Drawing tool, Retouching tool, Working with text, Layers, Filters (Blur filter, Brush stroke filter, Distort filter, Noise filter, Lighting effects, Sharpen filter, Sketch filter), Printing, mini project - photo album design

COMPUTERISED OFFICE MANAGEMENT

Module 1

OFFICE MANAGEMENT WITH COMPUTER WORD PROCESSING - (340 periods)

1.1 OFFICE AND ITS FUNCTIONS - (30)

- 1.1.1 Introduction to office
- 1.1.2 Concept of office - General, Traditional, Modern
- 1.1.3 Purpose of an Office
- 1.1.4 Role and Importance of office
- 1.1.5 Functions of an Office - Basic or Primary functions - Secondary or Auxiliary functions
- 1.1.6 Changing Office Scenario - Office yesterday- today-tomorrow
- 1.1.7 e-office- Meaning - importance- objectives- comparison with traditional office
- 1.1.8 Departmentation - Different sections in office and their functions

1.2 COMPUTER FUNDAMENTALS - (40)

- 1.2.1 History and generation of computers
- 1.2.2 Application and usage of computers
- 1.2.3 Classification of computers
- 1.2.4 Input - output - memory units
- 1.2.5 Block diagram
- 1.2.6 Hardware and Software (Including virus and antivirus software)
- 1.2.7 Memory devices - Primary and secondary storage devices - Data backup
- 1.2.8 Computer languages
- 1.2.9 Operating systems

1.3 COMPUTERISED TYPING (ENGLISH AND MALAYALAM) - (100)

- 1.3.1 Drill exercise of words, practicing alphabets.
- 1.3.2 Typing sentences and paragraphs. Speed practice, at the end of this module, the learner should acquire a speed of 25 w.p.m in English and 15 w.p.m in Malayalam (Unicode / Inscript key board layout is to be used for Malayalam Typing)
- 1.3.3 Fonts



- 1.4 WORD PROCESSING- Ms Word/Open Office. - (100)**
- 1.4.1 Advantages of word processing
 - 1.4.2 Getting started with word-Creating, saving, editing and formatting a document- working on a new document, formatting texts, templates, incorporating and formatting table, Formatting Page, Typing specimens, mail merge Printing the document, etc.
- 1.5 OFFICE MANAGEMENT - (20)**
- 1.5.1 Meaning and definition of office management
 - 1.5.2 Functions of office management
 - 1.5.3 Elements of Office Management
 - 1.5.4 Office Manager - Meaning
 - 1.5.5 Functions of office manager
 - 1.5.6 Qualifications of office manager
 - 1.5.7 Position of office manager
 - 1.5.8 Role and importance of office manager
 - 1.5.9 Qualities of a good Office Manager
- 1.6 OFFICE SECRETARY - (10)**
- 1.6.1 Meaning
 - 1.6.2 Qualifications of a secretary
 - 1.6.3 Qualities of a secretary
 - 1.6.4 Duties and responsibilities of a secretary
 - 1.6.5 Types of secretary
- 1.7 OFFICE MANUAL - (20)**
- 1.7.1 Meaning
 - 1.7.2 Purpose of office manual
 - 1.7.3 Contents of office manual
 - 1.7.4 Procedure of office work
 - 1.7.5 Advantages of office manual
 - 1.7.6 Organizational Chart - Types
 - 1.7.7 Advantages and limitations of organization chart
- 1.8 FRONT OFFICE MANAGEMENT - (20)**
- 1.8.1 Meaning
 - 1.8.2 Purpose of front office management
 - 1.8.3 Functions of Front Office
 - 1.8.4 Meaning of customer
 - 1.8.5 Types of customers

- 1.8.6 Customer need and satisfaction
- 1.8.7 Public relation meaning, importance and functions
- 1.8.8 Advantages of public relation
- 1.8.9 Interpersonal relationships in office

Module 2

OFFICE AUTOMATION - 340 Periods

- 2.1 OFFICE AUTOMATION - (30)**
 - 2.1.1 Introduction
 - 2.1.2 Objectives
 - 2.1.3 Merits and limitations
 - 2.1.4 Office machines and its uses - Computer, Fax, Photocopier, Modem, Telephone, Printer, Scanner, Dictating machine, Multi functional equipments
 - 2.1.5 Local Area Network
- 2.2 DATA MANAGEMENT - (90)**
 - 2.2.1 Data and Information
 - 2.2.2 Data Processing and its types
 - 2.2.3 Computers in data processing
 - 2.2.4 Spread sheets for office works (Excel/Open Office Calc)
 - 2.2.5 Relational Data Base Management (RDBMS) applications in office (MS Access/Base)
- 2.3 OFFICE FORMS - (40)**
 - 2.3.1 Office forms - Definition, meaning, purpose
 - 2.3.2 Forms management - Cycle
 - 2.3.3 Form design - Principles, Steps
 - 2.3.4 Types of forms - Paper forms and electronic forms
 - 2.3.5 Submission of online forms
- 2.4 REPORT PREPARATION AND PRESENTATION - (40)**
 - 2.4.1 Report - Meaning and importance
 - 2.4.2 Types of report
 - 2.4.3 Format of Report
 - 2.4.4 Report Writing - steps in Report writing
 - 2.4.5 Report presentation (MS Power point / Open office Impress)
- 2.5 RECORDS MANAGEMENT AND RTI ACT - (30)**
 - 2.5.1 Records - Definition, meaning and importance
 - 2.5.2 Objectives of records management
 - 2.5.3 Records management process



- 2.5.4 Classification of records
- 2.5.5 Filing - Meaning, importance and methods
- 2.5.6 Digital filing - merits and demerits
- 2.5.7 Centralised and decentralised filing
- 2.5.8 Indexing
- 2.5.9 RTI Act 2005 - Introduction - Objectives - Information to be disclosed - Responsible Officials - Application, Fees, Penalties, Appeal, etc.
- 2.6 COMPUTERISED TYPING (ENGLISH & MALAYALAM) - (80)
 - 2.6.1 Speed practice, At the end the learner should acquire a speed of 30 w.p.m in English and 20 w.p.m in Malayalam
- 2.7 COMMUNICATION AT WORK PLACE - (30)
 - 2.7.1 Self Introduction by Students
 - 2.7.2 Greeting a Person
 - 2.7.3 Know more about each other
 - 2.7.4 Talking About One's Family
 - 2.7.5 Tell about each other
 - 2.7.6 Introducing Oneself
 - 2.7.7 Telling the Time
 - 2.7.8 Describing Someone
 - 2.7.9 Asking Simple Questions.
 - 2.7.10 Likes and Dislikes
 - 2.7.11 Strengths and Weaknesses
 - 2.7.12 Talking about Aspirations, Influences, Values, Favorite Things
 - 2.7.13 Inviting Someone

COSMETOLOGY & BEAUTY THERAPY

Module - 1

Skin care

1.1 Skin

1.1.1 Introduction

1.2 Cosmetics and Equipments

Importance of sanitation and sterilization

1.3 Cosmetic science

1.4 Introduction of skin

- a) Structure
- b) Glands
- c) Functions
- d) Types of skin
- e) Skin disorders
- f) Skin care

1.5 Health, Nutrition and physiology

- a) Health, Nutrition
- b) Physiology of the head, face, neck, hands, feet, lowerarm

1.6 Facial mask and pack

Introduction, Ingredients, Mixing, application and use

1.7 Facial treatments

1.7.1 Importance of massage, Benefits, massage strokes

1.7.2 Facial for dry skin

Almond facial
Banana facial
Choco facial
Mixed fruit facial

1.7.3 Facial for oily skin

Papaya facial
Glycolic facial
Galvanic facial

1.7.4 Facial for normal skin

Vitamin E facial
Fruit facial
Golden facial

1.7.5 Pimple treatment



- Veg. peel
- Sebum control facial
- Saline facial
- High frequency

1.7.6 Pigmentation treatment

- Diamond facial
- Thermo herb
- Anti tan
- Pearl facial
- Platinum facial

1.7.7 Spa treatments

- Skin whitening spa facial

1.7.8 Treatment for under eye dark circle

- Eye spa treatment

1.8 Bleaching

- Introduction
- Importance of patch test
- Ingredients
- Application
- Advantages and disadvantages
- After care

1.9 Nail and Nail disorders

- Introduction
- Structure
- Purpose
- Composition
- Shape

1.10 Nail disorders

- Split nails
- Hang nails
- Brittle nails

10. Nail care

- Manicure/French manicure
- Pedicure/Fish pedicure
- Nail Art
- Artificial nail fixing

Module II

Hair care

1. Hair

Introduction
 Composition
 Layers of hair
 Life and density
 Types of hair

2. Hair disorders and treatments

Dandruff, split ends, Falling hair
 Treatments
 Hot oil treatment
 Henna treatment

3. Hair care

Shampooing
 Conditioning
 Pro-keratin
 Spa-treatment
 Protein treatment

4 Hair setting

Smoothing
 Straightening
 Blow drying
 Ironing
 Hair colouring

5. Hair cutting and styling

Straight cut	Petals	French plait
U- cut	Butterfly	Grapes
V-Cut	Pineapple	Fishbone
Feather cut	Pea cock	Apple pony
Hayer cut	8 knot	
Blunt cut	Frenchroll	Trendy hair styles

6. Hair removal methods

Threading
 Waning
 Depication and epitation



CRECHE AND PRE SCHOOL MANAGEMENT

Module:1

EARLY CHILDHOOD : DEVELOPMENT SUPPORT AND ASSESSMENT

(340 Periods)

1.1 Growth and Development (104 periods)

- Growth and Development: Meaning, Difference, Principles, Stages and Areas of development
- Factors affecting development - Role of Heredity and Environment on development
- Physical development: Meaning, Dimensions, General pattern, Importance of Growth monitoring
Motor development: Meaning, Sequence of development of major motor skills – Milestones up to 6 years, Assessment of Motor Development
- Cognitive development: Meaning, Dimensions(Perception, Memory, Reasoning, Problem solving and Creative thinking), Concept formation(size, shape, weight, number), Assessment of Cognitive development
- Social development: Meaning, Sequence, Characteristics of Social development , Assessment of Social Development
- Language Development: Meaning, Course of Language development, increase in the size of vocabulary in relation to age, Assessment of Language Development
- Aesthetic development: Meaning, Methods of expression, Activities for the development of Aesthetics
- Moral development: Meaning, Role of environment in moral development, activities for facilitating Moral Development
- Development Delay: Causes, Remedies, Designing activities to improve development in different areas

1.2 Handling children who are different (81 periods)

- Exceptional children-Meaning, classification, special needs, care and assistance
- Children with behaviour problems - Enuresis, encoprecis, thump sucking, nail biting, pica, phobias. Behaviour vaccines-role of life skills
- Learning disability- (Dyslexia, dysgraphia, dyscalculia, mixed learning disorder)- Remedial Education for LD: Basics
- Children with speech and articulation problems - stammering, stuttering, vocal tic - Speech Therapy-Basics

- ADHD(Attention Deficit Hyperactivity Disorder)-Class room activities to help the situation - Attention Enhancement Activities
- Habit disorders- Methods to break bad habits, CD (Conduct disorder), ODD(Oppositional Defiant Disorder)-Behaviour Therapy, Parent Management Training: Basics
- Other problems like IDD(Intellectual Developmental Disorder), cerebral palsy, Autism Spectrum Disorders(ASD)
- Importance of maintaining a good communication link with parents - Positive ways of communication, conflict resolution, breaking bad news, do's and don'ts in communication 70

1.3 Child care and support (65 periods)

- Needs of children (0 to 6 years)
- Physical care of the baby-feeding, bathing, washing, clothing and napping
- Feeding schedule-breast feeding, artificial feeding, supplementary feeding
- Safe guarding and welfare requirements for a child care centre (child protection, staff – qualities and qualifications, training, support and assessment)
- Preparing the environment for physical, motor, emotional social and cognitive development
- Personality building-some positive personality traits-environmental effects on the personality pattern

1.4 Nutrition and Health (90 periods)

- Health-Meaning and Dimensions, Inter relationship between Nutrition and Health
- Nutrition - Definition: Food, Nutrition and Nutrients, Classification of Nutrients, RDA (Recommended Dietary Allowance), Meal planning, Sources, Deficiency Diseases
- Methods of enhancing nutritive value of foods
- Healthy ways of cooking
- Principles and methods of nutrition extension
- Common Childhood diseases and its prevention-infections, seizures
- Immunization
- Minor ailments and home remedies
- Common accidents and first aid-wound, burns, fractures, drowning, poisoning, electric shock, choking, foreign body ingestion
- Procedure of conducting awareness programmes-organising, communicating with groups, clarifying doubts, preparing pamphlets



Module : 2

PRESCHOOL EDUCATION METHODS (340 Periods)

2.1 Preschool education— An Overview (110 periods)

- Education- Definition and Types
- Preschool Education – Significance, Need and Nature
- Historical and Philosophical Perspectives of Preschool Education - Global perspective (Froebel, Maria Montessori, John Dewey, Bruner) National perspective (Swami Dayanand, Swami Vivekananda, Rabindranath Tagore, Sri. Aurobindo Ghosh, Mahatma Gandhi)
- Pre-primary Education and Modern Psychologists -Arnold Gasell, J.B. Watson, Jean Piaget, E.H. Erikson
- National Policy on Education - Early Childhood Care and Education(ECCE), Important Commissions and Recommendations
- Role of International Agencies in Child Education and Care - UN, UNICEF, FAO, WHO
- Preschool environments in Kerala

2.2 Psychological foundations of preschool education (116 periods)

- Educational Psychology-Significance of Educational Psychology to the teacher in understanding the child, organising the curriculum and assessment
- Learning and Learning Theories—What is Learning, different learning theories (Behaviourism, Constructivism, Social Constructivism and Multiple intelligence)
- Social Development in Preschool years- importance of play, types of play
- Attention - Ways to improve attention, memory and forgetting.
Motivation- ways to enhance motivation
- Childhood Interests - discovering children's interests
- Habit Formation- ways, how to break bad habits
- Discipline - Types of discipline, disciplining children
- Character formation- Guiding the individual child, Meaning, Value, setting limits, importance of limits, limits with reason, setting age- appropriate limits, development of values, attitudes and commitments
- Inclusive education- Benefits

2.3 Preschool Teaching Practices (68 periods)

- Teaching Practices-Past and Present Preschool teaching practices in India,

Directions in NCF and KCF, Position papers, Curriculum suggested by Department of Women and Child Development, ICDS (Integrated Child Development Scheme)

- Kerala Preschool Curriculum-Chief characteristics, approach, learning experiences, learning environment, learning process, learning outcomes, other curricular activities
- Famous Methods of Preschool Education-The Kindergarten method, Montessori method, The Early Years Foundation Stage (EYFS) Method
- **Preschool Education in Different Countries**-Germany, Italy, Japan, UK, USA

2.4 A study of famous Preschool Education Methodologies (46 periods)

- The Kindergarten method - Origin and Development, Philosophy of Kindergarten, Froebel gifts, Learning through play, Today's kindergarten practices and deviations, case studies, syllabus and teaching methods, Evaluation, suggestions for improvements
- The Early Years Foundation Stage (EYFS) Method
- The seven areas of child development, curriculum planning, learning centers, activities, thematic integration, evaluation methods
- Montessori method -Dr. Maria Montessori and her work, Educational principles underlying the philosophy of Montessori
- An overview of the similarities and differences between the methods



CUSTOMER RELATIONSHIP MANAGEMENT

1. CUSTOMER CARE OPERATIONS

1.1 Fundamentals of CRM

1.1.1 Introduction to CRM (10)

- 1.1.1.1 Customer Relations
- 1.1.1.2 Concept of CRM
- 1.1.1.3 History of CRM
- 1.1.1.4 Purpose of CRM
- 1.1.1.5 Components of CRM

1.1.2 CRM Cycles & Phases (20)

- 1.1.2.1 Collection of information
- 1.1.2.2 Creating Customer Value
- 1.1.2.3 Building Loyal Customers
- 1.1.2.4 Acquisition of new Customers
- 1.1.2.5 Working towards increased profitability
- 1.1.2.6 Acquiring new relationship
- 1.1.2.7 Enhancing existing relationship
- 1.1.2.8 Retaining customer relationship

1.1.3 Steps to improve CRM (20)

- 1.1.3.1 Build a data base
- 1.1.3.2 Analyse, define types, profitability
- 1.1.3.4 Customer Selection
- 1.1.3.5 Activities to delight customers
- 1.1.3.6 Analyse again to see how we are doing

1.1.4 Steps in CRM Success (10)

- 1.1.4.1 Vision
- 1.1.4.2 Willingness to change
- 1.1.4.3 Willingness to share
- 1.1.4.4 Management Support

1.2. Customer Needs

1.2.1 Consumer VS Customer (5)

- 1.2.1.1 Meaning of Consumer
- 1.2.1.2 Meaning of Customer

1.2.2 Factors influencing customer needs (10)

- 1.2.2.1 Basic needs of customer
- 1.2.2.2 Factors influencing customer needs

1.2.3 Customer Behavior (15)

- 1.2.3.1 Identifying different customer types
- 1.2.3.2 Developing customers
- 1.2.3.3 Managing customers
- 1.2.4 Customer Types (10)
 - 1.2.4.1 Platinum
 - 1.2.4.2 Gold
 - 1.2.4.3 Iron
 - 1.2.4.4 Lead
- 1.2.5 Effective customer service (10)
 - 1.2.5.1 Factors satisfying customer needs
 - 1.2.5.2 Customer Behaviour
 - 1.2.5.3 Effective ways of dealing customers
- 1.2.6 Responding to customer needs (10)
 - 1.2.6.1 Customer questions and requests
 - 1.2.6.2 Information and advice to customers
 - 1.2.6.3 Recognize the problems of Customers
- 1.3 CRM in different Sectors**
- 1.3.1 CRM in Hotel Industry (20)
 - 1.3.1.1 Strategy adopted in hotels
 - 1.3.1.2 Attributes to implement CRM
 - 1.3.1.3 Guest Relation
- 1.3.2 CRM in Tourism Industries (20)
 - 1.3.2.1 Introduction
 - 1.3.2.2 CRM in Travel & Tourism
 - 1.3.2.3 CRM & Transport Agencies
 - 1.3.2.4 CRM in Tourism Intermediaries
- 1.3.3 CRM in Hospitals (10)
 - 1.3.3.1 Introduction
 - 1.3.3.2 Strategies for building relation ship
 - 1.3.3.3 CRM types
- 1.3.4 CRM in Banking Sector (10)
 - 1.3.4.1 CRM Application
 - 1.3.4.2 Benefits of implementing CRM
 - 1.3.4.3 Delivering Quality Service
- 1.3.5 CRM in Insurance Sector (10)
 - 1.3.5.1 Advantages of Implementation
 - 1.3.5.2 CRM as a customer centric Process
 - 1.3.5.3 Insurance Ombudsman



1.3.6 CRM in BPO/Call Sectors (10)

- 1.3.6.1 Customer service management in BPO/Call Centres
- 1.3.6.2 Customer relationships
- 1.3.6.3 Essentials of relationship
- 1.3.6.4 Components of Success
- 1.3.6.5 Categorisation of CRM in BPO/Call centres

1.4 e-CRM

1.4.1 Introduction to e-CRM (5)

- 1.4.1.1 Meaning
- 1.4.1.2 Importance
- 1.4.1.3 Features

1.4.2 e.CRM Process(5)

- 1.4.2.1 Basic requirements
- 1.4.2.2 e- CRM soft wares
- 1.4.2.3 Application of e-CRM

1.4.3 Benefits of e-CRM (5)

- 1.4.3.1 Direct Benefits to Business
- 1.4.3.2 Indirect benefits to Business
- 1.4.3.3 Benefits to Customers
- 1.4.3.4 Continuity
- 1.4.3.5 A contact point
- 1.4.3.6 Personalization

1.4.4 Implementation of e-CRM (10)

- 1.4.4.1 Customer Relation ship
- 1.4.4.2 Develop a Plan
- 1.4.4.3 Focus on Customers
- 1.4.4.4 Save money
- 1.4.4.5 Service and Support

1.4.5 Technologies in e-CRM (15)

- 1.4.5.1 Data warehousing
- 1.4.5.2 Customer profiling
- 1.4.5.3 Decision support
- 1.4.5.4 Voice Portal
- 1.4.5.5 Web phones
- 1.4.5.6 BOTs

1.4.6 Role of Social media in CRM (10)

- 1.4.6.1 Meaning and Importance of Social Media
- 1.4.6.2 Various Social Media Sites
- 1.4.6.3 Use of Social Media

- 1.4.6.4 Interacting with social media
- 1.4.6.5 Combating negativity in social media

1.5 Communication for Customer relations

- 1.5.1 Soft skills – Personality Development (30)
 - 1.5.1.1 Grooming
 - 1.5.1.2 Behavior
 - 1.5.1.3 Combat stage freight
 - 1.5.1.4 Professionalism
- 1.5.2 Communication Techniques – Methods: (30)
 - 1.5.2.1 Verbal
 - 1.5.2.2 Non Verbal
 - 1.5.2.3 Body Language
 - 1.5.2.4 Eye contacts
 - 1.5.2.5 Postures
- 1.5.3 Communication Techniques – Channels & Importance (30)
 - 1.5.3.1 Sender
 - 1.5.3.2 Receiver
 - 1.5.3.3 Purpose
 - 1.5.3.4 Oral and Group communication
 - 1.5.3.5 Presentation
 - 1.5.3.6 Speech
 - 1.5.3.7 Dialogue

Module 2

COMPUTER APPLICATION

2.1 Information technology

- 2.1.1. Introduction to Information Technology
- 2.1.2. Data processing - Data presented inside a computer
- 2.1.3. Characteristics of computers
- 2.1.4. History of computers - Evolution of computers
- 2.1.5. Classification of computers
- 2.1.6. Hard wired programming and stored program concept
- 2.1.7. Computer Organisation
- 2.1.8. Computer as a data processing machine
- 2.1.9. Basic computer operations - Functional units
- 2.1.10. System components
- 2.1.11. Input/Output ports (I/O ports)
- 2.1.12. Microprocessor
- 2.1.13. The Memory - Memory organisation - Types of memory
- 2.1.14. Advanced portable storage devices



- 2.1.15. Memory hierarchy
- 2.1.16. Input /Output Devices
- 2.1.17. Computer Software - Software - Classification of software - Malicious Software - Copyright - Software piracy Licensing - Free software philosophy
- 2.1.18. Application of information Technology
- 2.1.19. Communication - Business
- 2.1.20. Medicine and Health care - Entertainment
- 2.1.21. E-Governance - Education
- 2.1.22. Engineering manufacturing
- 2.1.23. Science
- 2.1.24. IT policy in Kerala state - E-commerce - M-commerce - Online trading - Net-Banking

2.2 Computer Hardware and Operating System

- 2.2.1 Components of a Personal Computer (5)
 - 2.2.1.1 Parts of a personal computer
 - 2.2.1.2 Booting
 - 2.2.1.3 BIOS
 - 2.2.1.4 POST
- 2.2.2 Disk Operating System (5)
 - 2.2.2.1 Microsoft Disk Operating System (MS-Dos)
- 2.2.3 Windows 7 OS (10)
 - 2.2.3.1 Windows 8
 - 2.2.3.2 Basic file and folder operations
 - 2.2.3.3 Accessories
- 2.2.4 Installing and Managing Windows 7 (20)
 - 2.2.4.1 Installing windows7
 - 2.2.4.2 Steps to install Windows 7
 - 2.2.4.3 Hard drive Preparation
 - 2.2.4.5 Formatting
 - 2.2.4.6 Device Driver
 - 2.2.4.7 Installing a printer driver
 - 2.2.4.8 Changing file views in windows7
 - 2.2.4.9 Control panel
 - 2.2.4.10 User creation and rights
 - 2.2.4.11 Trouble shooting
 - 2.2.4.12 Creating start-up disk
 - 2.2.4.13 Sharing files
 - 2.2.4.14 Internet connection and Firewall
 - 2.2.4.15 Windows Explorer
 - 2.2.4.16 Installing MS office

- 2.2.4.17 Installing DTP software
- 2.2.4.18 Installing Tally
- 2.2.5 Maintaining Computer Software (10)
 - 2.2.5.1 Transferring computer data
 - 2.2.5.2 Maintaining computer software

2.3 OFFICE AUTOMATION

- 2.3.1 Office Automation basics (10)
 - 2.3.1.1 Concept of office
 - 2.3.1.2 Nature of work in office
 - 2.3.1.3 Need for office Automation
- 2.3.2 MS Office (20)
 - 2.3.2.1 Starting MS word
 - 2.3.2.2 User interface of MS word
 - 2.3.2.3 Creating a document
 - 2.3.2.4 Insert header and footer
 - 2.3.2.5 Changing rows height and columns width
- 2.3.3 MS Excel (20)
 - 2.3.3.1 Starting MS Excel
 - 2.3.3.2 User interface of MS Excel
 - 2.3.3.3 The work sheet
 - 2.3.3.4 Formulae
 - 2.3.3.5 Sorting
 - 2.3.3.6 Working with chart
- 2.3.4 MS Power Point (10)
 - 2.3.4.1 Launching MS power point
 - 2.3.4.2 Creating presentation indifferent ways
 - 2.3.4.3 Inserting a new slide
 - 2.3.4.4 Adding themes
 - 2.3.4.5 Saving a presentation
 - 2.3.4.6 Set up the show
- 2.3.5 MS Access (10)
 - 2.3.5.1 Advantages of DBMS
 - 2.3.5.2 Data Models
 - 2.3.5.3 Terminologies used in RBDMS
 - 2.3.5.4 MS Access
 - 2.3.5.5 Creating a query in the query design option
 - 2.3.5.6 Creating a form using Form wizard
 - 2.3.5.7 Reports
 - 2.3.5.8 Import



2.4 LINUX AND OPEN OFFICE

2.4.1 Introduction to Linux (10)

- 2.4.1.1 History of Linux
- 2.4.1.2 Advantages of GNU Linux
- 2.4.1.3 Linux file system structure
- 2.4.1.4 Linux Kernel
- 2.4.1.5 Login and logout in Linux
- 2.4.1.6 Linux commands

2.4.2 Open Office writer (10)

- 2.4.2.1 Introduction to Open office
- 2.4.2.2 Apache Open Office
- 2.4.2.3 System requirement
- 2.4.2.4 Starting Open Office Writer

2.4.3 Advanced features of Open Office Writer (10)

- 2.4.3.1 Character Formatting
- 2.4.3.2 Background Colour
- 2.4.3.3 Paragraph Formatting
- 2.4.3.4 Bullets and Numbering
- 2.4.3.5 Indents
- 2.4.3.6 Creating an index of a document

2.4.4 Open office calc (10)

- 2.4.4.1 Open office Calc
- 2.4.4.2 Selecting cells
- 2.4.4.3 Cell formatting
- 2.4.4.4 Inserting Rows/Columns
- 2.4.4.5 Built in functions
- 2.4.4.6 Charts in Calc
- 2.4.4.7 Addressing Cells
- 2.4.4.8 Data Range
- 2.4.4.9 Work sheets
- 2.4.4.10 Auto fill
- 2.4.4.11 Filter
- 2.4.4.12 Data Sorting
- 2.4.4.13 Totals and sub totals
- 2.4.4.14 Protection

2.4.5 Open office impress (10)

- 2.4.5.1 Important features of impress
- 2.4.5.2 Bringing different objects into slides
- 2.4.5.3 Adding Text

- 2.4.5.4 Different views
- 2.4.5.5 Adding New Slides to Your Presentation
- 2.4.5.6 Background
- 2.4.5.7 Slide Transition
- 2.4.5.8 Animating objects in a slide
- 2.4.5.9 Watching slide show
- 2.4.5.10 Saving Your Presentation

2.5 INTERNET AND MALAYALAM COMPUTING

2.5.1 Introduction computer networks (5)

- 2.5.1.1 Network
- 2.5.1.2 LAN Topologies
- 2.5.1.3 Protocols
- 2.5.1.4 Connectivity devices
- 2.5.1.5 Windows 7 Firewall Settings

2.5.2 Internet and Email (10)

- 2.5.2.1 History of the Internet
- 2.5.2.2 Connecting Computer to Internet
- 2.5.2.3 Types of Internet Connection
- 2.5.2.4 World Wide Web (www)
- 2.5.2.5 Web Browser
- 2.5.2.6 Search Engines
- 2.5.2.7 Email (Electronic mail)
- 2.5.2.8 Creating and using free email account with Gmail

2.5.3 HTML (10)

- 2.5.3.1 Starting with HTML
- 2.5.3.2 Attributes of <HTML> tag

2.5.4 Malayalam Computing (20)

- 2.5.4.1 Malayalam through Computers
- 2.5.4.2 Free Software and Language Computing
- 2.5.4.3 Malayalam and Technology
- 2.5.4.4 Malayalam digital Technology
- 2.5.4.5 Unicode
- 2.5.4.6 Malayalam Using Transliteration
- 2.5.4.7 Malayalam Word Processing
- 2.5.4.8 Downloading and Installing Malayalam Fonts
- 2.5.4.9 Installing Fonts in Windows
- 2.5.4.10 How to enable Malayalam in Web Browsers?
- 2.5.4.11 Malayalam in UBUNTU
- 2.5.4.12 Malayalam keyboard and Typing

2.5.5 Ethical and Social Issues in Information Systems (5)

- 2.5.5.1 Ethics and Information Systems
- 2.5.5.2 Ethical Analysis
- 2.5.5.3 Information right: Privacy and freedom in the internet



DENTAL TECHNOLOGY

MODULE I - BASIC CONCEPT OF DENTAL TECHNOLOGY AND DENTAL ASSISTANCE

UNIT 1.1 HUMAN DENTITION

- 1.1.1 Basics of teeth and dentition
- 1.1.2 Basic anatomy of oral cavity
- 1.1.3 Parts of tooth
- 1.1.4 Dental chronology
- 1.1.5 Anatomical landmarks of oral cavity

UNIT 1.2 MATERIALS USED IN DENTAL LAB AND CLINIC (composition, properties and manipulation)

- 1.2.1 Gypsum products
- 1.2.2 Dental waxes
- 1.2.3 Separating medias
- 1.2.4 Denture base materials
- 1.2.5 Abrasives and polishing materials
- 1.2.6 Impression materials
- 1.2.7 Dental cements
- 1.2.8 Teeth materials

UNIT 1.3 SCIENCE OF DENTAL MATERIALS

- 1.3.1 Applied Mechanics
Importance of mechanics in dentistry like stress, strain, permanent deformation, elastic limit, proportional limit, modulus of elasticity, strength, color, force and power of friction.
- 1.3.2 Applied Chemistry
Importance of chemistry in dentistry like physical and chemical changes, mixtures and compounds, electroplating, tarnish and corrosion.
- 1.3.3 Applied Physics
Importance of physics in dentistry like concept of heat transmission, specific density, capillarity, spot-welders, principles of electroplating and elasticity.

UNIT 1.4 ANATOMY OF FACE AND NECK

- 1.4.1 Facial bones and jaw relation - All facial bone, their position, Maxilla and Mandible
- 1.4.2 Nerves, veins and arteries of face - Basic arteries, veins and nerves and their branches
- 1.4.3 Temporomandibular Joint - Bones & Liagements associated
- 1.4.4 Muscles of mastication

1.4.5 Movements of mandible/temporomandibular joint

1.4.6 Deglutition

1.4.7 Muscles of facial expression

UNIT 1.5 DENTAL ANATOMY

1.5.1 Incisors - maxillary and mandibular

1.5.2 Canines - maxillary and mandibular

1.5.3 Pre-molars - maxillary and mandibular

1.5.4 Molars - maxillary and mandibular

UNIT 1.6 EQUIPMENT'S USED IN DENTAL LABORATORY

1.6.1 Equipment's and instruments used in dental laboratory

Handling of equipment's in Dental Laboratory - Acryliser, Dental Lathe, Model trimmer and micro motor

UNIT 1.7 DENTAL ASSISTANCE PART 1

1.7.1 Instruments, equipment's and materials used in dental clinics

1.7.2 Sterilization and infection control in dental clinic - Basics in sterilisation, Micro organisms found, Need, Equipments and materials, Use of mask & gloves

MODULE 2

DENTAL MECHANICS - 1

FABRICATION OF COMPLETE DENTURES

UNIT 2.1 INTRODUCTION TO DENTAL MECHANICS

2.1.1. Introduction, Objectives and scope of Prosthodontics

Definition, Classification of Prosthodontics, Objectives of Prosthodontic Appliance, Scope of Prosthodontics

UNIT 2.2 FABRICATION OF COMPLETE DENTURES

2.2.1. Impression Trays

Classification, fabrication and uses of Impression trays

2.2.2. Primary impression and primary cast. Principles and factors affecting impression making - Definition of Primary Impression, Pouring of Primary cast.

2.2.3. Secondary Impression

Special tray fabrication, Border Moulding, Wash Impression, Failures in manipulation of impression.

2.2.4. Casting of secondary impression

Preservation of Impression, Beading and boxing of Impression, Preparation of cast.

2.2.5. Temporary Denture Base

Fabrication of temporary denture base with shellac and acrylic resin, Extension of temporary denture base, Role of Temporary Denture Base

2.2.6. Occlusal Rims

Definition, Role of Temporary Denture Base, Fabrication of Denture Base



- 2.2.7. Jaw Relation
Orientation, Vertical and Horizontal Jaw Relation
- 2.2.8. Articulators and Articulation
Types of Articulators, Procedure of Articulation
- 2.2.9. Occlusion and Teeth Setting
Definition of Occlusion, Familiarisation of terms like overjet, over bite, key of occlusion, occlusal plane, curve of spee, balanced occlusion, centric relation, centric occlusion, Principles of teeth setting of anterior and posterior teeth
- 2.2.10. Finishing of Wax dentures
Waxing up, festooning, shipping, posterior palatal seal, importance of finishing wax dentures, mistakes during wax up
- 2.2.11. Flasking
Dental Flask, Procedure of flasking, Importance of separating media, single pour and double pour techniques, materials used, mistakes of dental flasking procedures
- 2.2.12. Dewaxing
Procedure of dewaxing, importance/role of dewaxing, possible mistakes
- 2.2.13. Packing
Procedure, Manipulation of Resin, Importance of temperature and separating media possible mistakes
- 2.2.14. Curing
Acryliser, procedure of curing, importance of temperature, possible mistakes
- 2.2.15. Deflasking
Procedure of deflasking, possible mistakes
- 2.2.16. Trimming and polishing
Procedure, materials used, mistakes during the procedure.
- 2.3. REMOVABLE PARTIAL DENTURE (RPD)**
 - 2.3.1. Introduction, terminologies, classification
Terminologies used in removable partial denture, classification of removable partial denture and identical arches
 - 2.3.2. Components of removable partial dentures
Parts of removable partial dentures, Maxillary and mandibular major connectors, Minor connectors, Rests - types and uses, Direct Retainers, Reciprocal stabilising components, Indirect Retainers, Denture base types, advantages and disadvantage
 - 2.3.3. Steps in fabrication of removable partial denture
Steps in fabrication (Basic), Surveyor
- 2.4. FIXED PARTIAL DENTURE**

- 2.4.1. Basics of Fixed Partial Dentures
Terminologies, Divisions, Types of fixed restorations
- 2.4.2. Parts of FPD and Types
Parts, classification and Indications of FPD
- 2.5. REPAIR OF DENTURES**
- 2.5.1. Causes of Fracture of teeth
- 2.5.2. Procedure for repairing of completely fractured denture
- 2.5.3. Procedure for replacing fractured or separated Teeth
- 2.6. IMMEDIATE AND OVER DENTURES**
- 2.6.1. Immediate Dentures
Indications and contra Indications, Advantages and disadvantages, Procedure of fabrication of immediate dentures
- 2.6.2. Over Dentures
Indications, Contra indications, Advantages, disadvantages and procedure of fabrication of over dentures.
- 2.7. DENTURE RELINING AND REBASING**
- 2.7.1. Denture relining
Definition, Advantages, Disadvantages, Reasons Procedure of Denture Relining
- 2.7.2. Denture Rebasing
Definition, Advantages, Disadvantages, Reasons and procedure for denture rebasing
- 2.8. NEWLY LAUNCHED PRODUCTS**
- 2.8.1. Bio functional Prosthetic system
Definition, Advantage, Difference between BPS and conventional Acrylic Dentures
- 2.8.2. Flexible Dentures
Definition, Advantages, Materials used, Basic procedure
- 2.9. ORAL AND MAXILLO FACIAL PROSTHESIS**
- 2.9.1. Introduction to Oral and Maxillo facial prosthesis
Definition, Objectives, Types
- 2.10. INTRODUCTION TO DENTAL IMPLANTS**
- 2.10.1. Definition, Identification of Parts, Advantages and disadvantages



DIARY TECHNOLOGY

Module 1 : DAIRY FARM MANAGEMENT

Unit 1 : Introduction to Dairying

- Role of livestock in Indian economy:
- Advantages and disadvantages of dairy farming:
- Body parts of cattle:
- Judging of dairy cattle.
- Common breeds of cattle, buffalo and goat
- Technical terms related to dairy farming

Unit 2 : Design and Construction of Cattle shed

Selection of Site for a Dairy farm:

- systems of rearing – Advantages and disadvantages of:
- Conventional housing system-head-to-head and tail-to-tail.
- Loose housing system
- Free range system.
- Plan and design of cattle shed:
- Floor space requirements of manger, feeding passage, standing space, dung channel, central passage.
- Different types of sheds required in a farm.
- Waste disposal in farms:

Unit 3 : Dairy Cattle Physiology

Digestive system

- Structure of ruminant stomach
- Functions
- Reproductive system
- Structure of male and female reproductive system
- Functions of important organs
- Oestrus cycle
- Heat detection
- Artificial insemination-importance and methods(Speculum method and Recto Vaginal method)

Unit 4 : Dairy Cattle Management

Handling of animals :

- Restraining Equipments.
- Identification methods:
- Different identification methods-Tattooing, Ear tagging and Branding.
- Calf Management:
- Handling of new born calf
- Weaning of calf.

- Colostrum feeding.
- De-horning.
- De-worming.
- Castration.
- Breeding Systems:
- Methods of breeding.
- In breeding.
- Cross breeding
- Grading –up.
- Signs of good health:
- Normal values of temperature, pulse rate and respiration rate.
- Common diseases- Mastitis, FMD, Anthrax, Milk fever and Ketosis.
- Farm records:

Unit 5 : Feeds and Feedings

Introduction:

- Concentrates and roughages.
- Classification:
- Feed stuffs.
- Fodder-Hybrid Napier, Guinea grass, Congo signal, Para grass.
- Fodder Preservation techniques:
Hay and Straw, Silage/ Haylage
- Ration:
- Basic idea of important nutrients.
- Computation of balanced ration.
- Equipments- Introduction to knowledge about, Tractor, Tillers, Harvester, Chaff cutter, Grinder

Module 2 : MILK PRODUCTION, PROCESSING AND QUALITY CONTROL

Unit 1 : Lactation

- Physiology of milk production:
- Structure of udder.
- Let down of milk.
- Influence of hormones.
- Milking:
- Hand milking
- Machine milking
- Milking parlor

Unit 1 : Milk

- Milk:
- Definition.
- Composition of milk.



- Factors influencing the composition of milk.
- Estimation of fat and SNF% in milk.
- Properties of milk:
- Introduction to physical and chemical properties of milk.
- Estimation of acidity, specific gravity and boiling point of milk.
- Factors influencing the physico-chemical properties of milk.
- Common adulterants in milk.
- Neutralizers in milk.
- Preservatives in milk.
- Platform tests.
- Microbiology of milk:
- Basic awareness.
- Common microorganisms present in milk.
- Microbial standard of raw and pasteurized milk
- Effects of microbial action in milk/microbial spoilage of milk
- Clean Milk Production.

UNIT 3 FLUID MILK PROCESSING

Standards:

- PFA standards of cow milk, buffalo milk and goat milk.
- Pasteurization of milk:
- Definition of pasteurization of milk.
- Objectives.
- Methods of pasteurization.

HTST pasteurization:

- Schematic diagram.
- Process detailing.
- Milk standardization.
- Cream Separation of milk.
- Homogenization of milk

Cleaning and Sanitization

- Detergents and sanitizers-desirable characters
- Common detergents and sanitizers used in dairy plant
- Cleaning and sanitization methods-CIP systems

Sterilization:

- Definition
- Methods- In-bottle sterilization, UHT sterilization.

ECG & AUDIOMETRIC TECHNOLOGY

Module 1 : BASICS OF CARDIOLOGY AND ELECTRONICS PRINCIPLES (340 Periods)

1.1 Human anatomy overview

- Anatomy, Physiology, Anatomical Position, Anatomical terms

1.2 Cell

- Structure of a cell and its functions

1.3 Skeletal system

1.3.1 Familiarization of human skeleton

1.3.2 Classification of bones

1.3.3 Thoracic cage

- Sternum, ribs, vertebrae

1.3.4 Mediastinum

1.4 Bioelectricity

1.5 Respiratory system

- Structure, functions and mechanism of respiration

1.6 Cardiovascular system

1.6.1 Position and relations of heart

1.6.2 Layers of heart

1.6.3 Pericardium

1.6.4 Cardiac muscles

1.6.5 Chambers of heart and associated blood vessels

1.6.6 Valves of heart

1.6.7 Circulation of blood

1.6.8 Coronary arteries

1.6.9 Conduction system of heart

1.6.10 Cardiac cycle

1.6.11 Heart sound

1.6.12 Physiological variables associated with cardiac cycle

1.7 Heart disease (Brief awareness only)

- Coronary heart disease
- Cardiac arrhythmias
 - Tachyarrhythmia
 - Bradyarrhythmia
 - Conduction abnormalities



- Structural heart disease
disease of the
 - Myocardium, Pericardium,
 - Valvular heart disease,
 - Septal defects
- Abnormalities in cardiac position
 - Dextrocardia (Situs inversus dextrocardia,
 - Isolated dextrocardia, Mesocardia)
- Miscellaneous
 - Rheumatic fever,
 - Cardiac tumour,
 - Infections of the heart

1.8 Electronics Principles and Practice

- 1.8.1 Ohms law-resistance, resistivity
- 1.8.2 Colour coding of resistors
- 1.8.3 Kirchoff's laws-wheatstones bridge, meterbridge
- 1.8.4 Active and passive transducers
- 1.8.5 Electrodes used for ECG recording
- 1.8.6 Biological amplifiers

Module 2 : CARDIOVASULAR DIAGNOSIS (340 Periods)

2.1 Electrocardiography

- 2.1.1 History of Electrocardiography
- 2.1.2 Basic Principle of ECG
- 2.1.3 Lead system
- 2.1.4 Standardization
- 2.1.5 Damping
- 2.1.6 ECG Paper
- 2.1.7 ECG Machine
- 2.1.8 Procedure of ECG recording
- 2.1.9 Normal ECG waveform
- 2.1.10 Parameters of ECG
- 2.1.11 Artifacts in ECG
- 2.1.12 Common ECG abnormalities
- 2.1.13 ECG Technician
 - Role in recognition of life threatening conditions
 - Non cardiac conditions which can make ECG look abnormal

2.2 Exercise ECG

- 2.2.1 Types of Exercise ECGs

- 2.2.2 Treadmill Test
 - Principle
 - Procedure
 - Uses
- 2.3 Holter Monitoring / Ambulatory ECG
 - Principles of Holter
 - Utility and indications
- 2.4 Cardiac Monitors
 - Instrumentation
- 2.5 Echocardiography
 - 2.5.1 Principle of echocardiography
 - 2.5.2 Instrument, techniques, types and uses
- 2.6 Cardiac Catheterization
(Basic awareness)
- 2.7 Defibrillators
 - 2.7.1 Principle, parts, types, precautions
Implantable Cardioverter Defibrillator(ICD)
- 2.8 Pacemakers
 - 2.8.1 Parts, Classification
- 2.9 Cardiopulmonary resuscitation (CPR)
 - 2.9.1 Basic life support
 - 2.9.2 Advanced life support
- 2.10 Screening of heart disease
 - 2.10.1 Risk factors of heart disease and its management
 - Calculation of body mass index
 - Body composition monitor
 - Automated digital B.P apparatus
 - ECG
- 1.11 Medical Ethics

ELECTRICAL AND ELECTRONICS TECHNOLOGY

Module: 1

BASIC ELECTRICAL & ELECTRONICS TECHNOLOGY

Unit 1 - Fundamentals of Electricity (40 Hrs)

Resistance- Factors affecting resistance- Series and Parallel connections of Resistors- Conductors, Insulators - Properties- Concepts of Voltage & Current- Familiarisation of analog and digital meters- Connection of Ammeters and Voltmeters-Ohm's Law- KCL & KVL.

Unit 2 - Electronic Components and Devices - I (60 Hrs)

Passive components-resistors-colour coding of resistors-capacitors-Types of capacitors-Testing-Inductor-Types-Basics of semiconductor theory-Extrinsic semiconductor-doping-Intrinsic semiconductor-PN junction-Diode-biasing-VI characteristics, testing of diodes. -

Diode as a rectifier-centre tap and bridge rectifier-filter component and their role in reducing ripples.

Unit 3 - Assembling and Repairing of LED Lamps (150 Hrs)

Soldering and De soldering techniques, tools/materials for soldering, soldering procedure, safety precautions in soldering. Soldering of electronic components in PCB

LED construction, working, applications and testing- advantages & disadvantages of LED Lamps. Assembling of LED lamps- Basic circuit-parts & working,

Fault finding and repair of LED lamps - Testing, identifying and rectifying component level faults-testing, identifying and rectifying LED strip level fault.

Unit 4 - House Wiring - I (90 Hrs)

Safety precautions- First aid practice- I.E rules related to house wiring- Kerala Cinema regulation rules-Tools and Accessories- Types of wires- Ratings -Voltage drops in cables- Wire joints- Types of house wiring- PVC Conduit, Casing and capping- Fuses- re-wireable & HRC, MCB, MCCB, ELCB- Earthing- Importance-Functional and Protective earthing-Size of earth electrodes- Pipe earthing and Plate earthing, Earth tester, Measurement of Earth resistance, Relays- Electrical contactor.

Module -2

HOUSE WIRING

Unit 1 - House Wiring - II

(200 Hrs)

Lay out and circuit diagrams- Sub circuit calculation- Design of Distribution board (LDB and PDB) - Wiring Practice- Series, Parallel, Series-parallel- Stair case, Master control, Bell and buzzer-Hospital wiring- Megger, Testing of wiring installation, Wiring of special equipments-Inverter & UPS. Code of conduct and ethics of the wire man.

Estimation of a 2/3 bedroom house wiring as project work

Illumination- Lumen and Efficacy- Incandescent lamps- Fluorescent lamps- CFL lamps- Applications of Neon lamps, Halogen lamps, Sodium Vapour lamps.

Unit 2- Magnetism

(20 Hrs)

Magnets- Types- Properties- Magnetic field, Magnetic flux, Flux density, Permeability- Classification of Magnetic materials- Faraday's Laws of Electromagnetic induction- Self induction- Mutual induction- Lenz's Law, Cork Screw rule, Right hand thumb rule, Eddy current and Hysteresis.

Unit 3 - AC Circuits

(90 Hrs)

Electrical power generation-Types of generating stations - AC sine wave - Time period, Frequency, Amplitude, RMS Value, Average Value, Form factor, Peak factor- Phase- Phase difference- Types of loads- Resistive, Inductive and Capacitive- Impedance- Series circuits (RL, RC and RLC)- Power factor and its importance- Power factor improvement. kW, kVA, kVAR. - Power and Energy- Connection of Watt meter and Energy meter, Calculation of Energy Bill- Methods for saving Electrical energy in domestic installations. Uses of Tong tester and Multi meter.

Three Phase Circuits- Star and Delta connections- Phase and Line values.

Unit 4 - Transformers

(30 Hrs)

Transformer- Working principle- Construction- Core and Shell types- Transformation ratio- Parts of L.V and H.V transformers- Cooling- Rating, Losses and Efficiency- Auto transformer - Functions of substations.

ELECTRONICS & COMMUNICATION TECHNOLOGY

Module 1

BASIC ELECTRONICS AND SOUND ENGINEERING

Unit 1 Introduction to sound Engineering

Sound effect, fundamental units of Audio signal - Intensity, frequency, Pitch. Frequency range of audio signal.

Units of measurement of sound intensity, Decibel , Adverse effects of sound pollution & prevention.

Application of sound - Live - Broadcasting. Microphones and its use, symbol , Moving coil microphone - working , Various types of microphones and its connections (Introduction only). Loud speakers and its use, symbol of loud speaker, Moving coil loud speaker- working. Different types of loud speakers and their identification.(introduction only) Specifications and characteristics of microphones and loud speakers-comparison

Unit 2 Hobby circuits

Identification of components and their symbols in the given circuit.- Resistor, Capacitor, Inductor, Diode, Transistor, LDR, IC, LED. Testing of Diode, Transistor- using multimeter. Colour coding of resistors. Various techniques in soldering, solder and de solder on PCB. Define the terms- Current, Voltage, Resistance and statement of Ohm's Law. Measurement of current, voltage, and resistance-using multimeter Concept of AC and DC, conversion of AC into DC . Block diagram and explanation of Regulated DC Power Supply. Transistor and its applications. Sensors and Modules. MOSFET and IGBT

Unit : 3 Audio Amplifier

Audio Amplifier and its application . Amplifier using Transistor / IC TBA 810 . Gain of Amplifier, Noise . Measurement of Amplitude and Frequency with the help of CRO and Function Generator. Introduction of different types of audio cables and connectors and their applications Classification of cables and connectors

Unit : 4 Audio Effects

Mono and Stereo effects of sound . Setting up of simple Mixer and Equalizer . Different blocks of PA system Installation and testing of Public Address System - -with out noise pollution , Different standards of sound- Noise reduction techniques-Dolby system

Unit : 5 Audio Processing and Recording

Studio Mixer and its operation . Understand Routing and Panning, Phase reversal and Flip .Block diagram of Digital audio work station. Concept of Equalisation , Band width and Gain. Comparison of Graphic, Complementary and Automated Equalizers . Introduce frequency Analyser and Harmonic Generator.

Project : construct a LED lamp or a Solar based lamp

Doppler effect, Nyquist theorem, Sampling theorem. Construction of simple

Equalizing circuits (LPF and HPF). Construction of Audio Bass / Treble board. Live Digital Recording. - Observing. Brief description of Audio Studio schematic . Audio recording room familiarisation . Audio control room familiarisation . Introduce Audio console.

Module 2 : DIGITAL ELECTRONICS, HARDWARE AND NETWORKING

Unit :1 Digital Electronics

Digital and Analog systems-comparison , Binary number system- decimal to binary, binary to decimal, Elements of Digital logic -Logic gates (OR, AND, NOR, NAND, NOT)- Truth table, Encoding, Decoding, Multiplexing, De-multiplexing, Counter, Flip Flop, register. Digital Computers- Study of different parts of a computer system, Block diagram Explanation. SMPS Working with BD,UPS - Working and familiarisation.

Unit : 2 Input/ Output devices

Familiarisation of Basic input devices. Keyboard, Mouse, Audio port, Scanner, Webcam

And other I/P devices and their use. Familiarization of Basic O/P devices. Monitor, Modems Printer, Headset, audio cards -Latest input and output devices- listing

Unit : 3 Mother board and CPU

Familiarisation of parts of a mother board . Interfacing of Mother Board.

different pins, ports, sockets in Mother board Different types of processors -speed , cores and RA. Identify different slots, Fixing and removing RAM on the mother board. Different types of processors -speed , cores and RA. Identify different slots, Fixing and removing RAM on the mother board.

Unit : 4 Memory Device

Role of memory in a computer system , RAM, ROM, PROM, EPROM, comparison ROM and RAM - Comparative study of RAM, DRAM, SRAM, SDRAM, DDRAM. Types of expansion cards CD, DVD, USB, Drives- pen drive, external hard drive, graphics card. Assemble a computer, Safety and security , Trouble shooting of PC. Familiarisation of Lap Top, Note Book.

Unit: 5 Operating System

Operating system , Windows , Linux ,Free Software, UBUNDU Installation Procedure-Different steps in Installation, Mac os . Partitioning of HDD, Trouble shoot a PC. Install different I/P, O/p devices, Identify and use of proper cables .e-waste, ill effects of e-waste , how to minimise e-waste ,dispose e-waste safely

Unit: 6 Computer Networking

Introduction to networking .Need for networking ,Understand different network topologies.-Bus, star, Ring, Tree etc. Introduction to router and switcher, Introduction to LAN ,Compare LAN, MAN, WAN, - Bridge, Gate way, Hub switch, world wide web. Wireless LAN, Wireless node, Wifi , Bluetooth, Bluetooth standards

FASHION & APPAREL DESIGNING

Module I

FUNDAMENTALS OF FASHION AND GARMENT CONSTRUCTION

Unit – I : Basic Concepts of Fashion and Apparel Designing

- Apparel & Clothing – Meaning, Importance and functions
- Fashion Concepts & Terminology – Style, Design, Trend, Classics, Fad
- Fashion Cycle
- Factors Influencing Fashion – Economic, Sociological & Psychological
- Fashion & Apparel Industry
- Career opportunities in the field of fashion and apparel designing.

Unit – II : Sewing Tools & Equipments

- Sewing Tools and Equipments
- Measuring Tools – Measuring tape, rulers, L – Scale etc.
- Marking Tools – Marking chalk, pencils, fabric pens, Tracing wheel, French curve, hip curve, hem gauge etc.
- Cutting Tools – Scissors, Shears, Pinking Shears, Thread cutter, Industrial cutting machines etc.
- Stitching Tools – Sewing machine, Needle & Thread, Thimble, Notcher, bodkin etc.
- Pressing tools – Table, pressing pad, iron box etc.

Unit – III : Sewing Machine

- Types – Single Needle Lock Stitch Machines, High Speed Lockstitch Machines, Double Needle Machine, Over lock / Over Edge Sewing Machine, Button Sewing Machine, Buttonhole Sewing Machine, Fusing Machine
- Parts and functions
- Sewing Machine Operation
- Care and maintenance of Sewing Machine
- Minor problems and their rectification
- Special Attachments in Sewing Machines – Tucker, Binder, Ruffler, Hemmer, Zig-zager, Quilter, Zipper foot, Cording Foot , Cloth Guide & Embroidery Plate

Unit – IV : Basics of Garment Construction

- Basic hand stitches – Constructive stitches (Temporary – Even tacking, Uneven & Diagonal Permanent – Running, back stitch, overcasting, hemming, blanket Stitch)
- Seams – Plain Seam, Flat fell Seam, French Seam, Lapped Seam
- Seam Finishes – Pinked Seam finish, Overcasting, Double Stitch Seam Finish, Herringbone Seam Finish, Edge stitch, Bound Seam Edge Finish

- Introducing fullness in Garments – Darts, Tucks, Gathers, Pleats, Flares & Godets.
- Plackets – Continuous & Two piece
- Fasteners – Buttons & Buttonholes, Show buttons & loops, Hook & Eye, Snaps, Zipper & Eyelet hole & cords
- Neckline finishes – Facing & Binding
- Collars – Shirt Collar, Standing Collar, Peterpan Collar
- Pockets – Patch pockets, Set-in pockets & In-seam pockets

Unit – V : Fashion Figure – Sketching

- Introduction & meaning
- Drawing tools and media
- Object and Design Drawing – Freehand drawing and shading of basic shapes and objects using pencil
- Silhouette Sketching – Freehand drawing and shading of basic garment shapes
- Human Figure Drawing

Unit – VI : Elementary Textile Science

- Fiber – meaning, classification
- Characteristics – Cotton, Linen, Silk, Wool, Rayon, Nylon, Polyester & Acrylic
- Fiber Identification (Physical, Microscopic and Burning Tests)
- Yarns – Types (Staple & Filament, Ply, Doubled & Novelty)
- Yarns – Formation, Properties
- Fabric Formation (Weaving – Process & Structure, Felting, Knitting)
- Fabric Construction
- Fabrics defects – Missing warps or wefts, Knots, Slubs, Float, Gout, Hole, Tear, Broken Pattern, Coloured Flecks & Stains
- Fabric Processing – Singeing, Bleaching, Mercerizing, Calendaring, Waterproofing, Printing & Dyeing

Module II – Garment Ornamentation Techniques

Unit – I : Introduction to Garment Ornamentation

- Garment ornamentation – Meaning, importance and types
- Embroidery – Types (Hand & Machine)
- Embroidery – Tools and equipments
- Design transferring methods – Direct, Carbon, Running, Pricking or Pouncing & Hot iron transferring method.

Unit – II : Hand & Machine Embroidery

- Hand Embroidery Stitches – Classification and Use
- Outline stitches – Running Stitch, Back Stitch & Stem Stitch
- Chain stitches – Chain Stitch, Lazy – daisy & Feather Stitch
- Filling stitches – Satin Stitch, Long and Short Stitch & Fishbone Stitch



- Knot stitches – French Knot & Bullion Knot
- Marking stitches – Cross Stitch & Star Stitch
- Border stitches – Blanket Stitch, Buttonhole Stitch & Herringbone Stitch,
- Machine Embroidery – Parts, functions and operation

Unit – III : Creative Ornamentation Techniques

- Traditional Embroidery of India
- Appliqué work – Overlaid & Inlaid
- Cut work – Simple & Venetian
- Shadow Work
- Scalloping
- Quilting
- Mirror Work
- Smocking – Stem & Cable stitch
- Kamal work
- Kantha work
- Kasauti work
- Zardosi work
- Crochet – Tools & Materials & Stitches

Unit – IV : Fashion Figure – Colouring

- Introduction & meaning
- Painting – Tools and medium
- Colour – Colour Wheel & Colour mixing
- Painting and shading – Basic shapes and objects
- Painting and shading – Silhouette of skirts, sleeves, frocks etc.

Unit – V : Textile Dyeing

- Dyeing – meaning,
- Dyeing Methods – Fiber Dyeing, Yarn Dyeing, Fabric Dyeing & Garment Dyeing
- Dyes and Pigments – Definition
- Dyes and Pigments – Classification, (Natural & Synthetic Dyes.), Advantages and Limitations of Natural & Synthetic Dyes.
- Dyeing of bleached fabric with reactive dye.
 - Materials required
 - Deciding the shade
 - Dye bath preparation
 - Dyeing procedure
 - After treatment

Unit – VI : Textile Printing & Fabric Painting

- Textile printing – Meaning, Distinguishing features.

- Textile Printing – Styles (Direct, Discharge & Resist)
- Textile Printing – Methods (Block, Roller, Duplex, Stencil, Screen, Tie and dye & Batik)
- Block Printing
 - Material required
 - Preparing dye paste
 - Printing process
- Stencil Printing
 - Material required
 - Preparing dye paste
 - Printing process
- Screen Printing
 - Material required
 - Preparing dye paste
 - Printing process
- Tie & Dye
 - Material required
 - Preparing the fabric
 - Preparing dye bath
 - Tying and dyeing process
- Batik
 - Material required
 - Preparing the fabric
 - Preparing dye bath
 - Dyeing process
 - Removing wax
- Fabric Painting – Meaning
 - Materials Required
 - Fabric Painting – Factors to be Considered

Fabric Painting – Methods (Outlining, Filling, Shading, Double Colour Shading, Dot Painting, Stroke painting & Free hand painting)



FOOD AND RESTAURANT MANAGEMENT

MODULE 1

GUEST SERVICE ASSOICATE

Unit No.1.1 - Introduction to Hotel, Food & beverage Industry

Periods: 20

Introduction to catering establishments and hotels.

- Classification of catering establishment
- Types of hotels

Introduction to Restaurants

- Types of restaurants

Introduction to other Catering establishments

- Welfare catering
- Transport catering

Unit No.1.2 Restaurant organizational hierarchy

Periods: 20

Organization of a Restaurant

- Staff hierarchy - English, French & American terminology
- Job description of a steward
- Duties & responsibilities of steward

Attributes of a Steward

- Personal hygiene & grooming
- Other attributes

Coordinating departments

- Front office
- Housekeeping
- F& B Production

Unit No.1.3 - Restaurant layout and service equipment

Periods: 30

Restaurant Layout

Restaurant Equipments

- Restaurant furniture
- Linen
- Equipments

Unit No.1.4 - Types of Menu and cover setup

Periods: 80

Classical French Menu

Types of Menu

- Ala carte
- Table d' hote

- Carte du jour
 - Setting the side station
- Types of Cover and Serviette folding
- Ala carte
 - Table d' hote
 - Serviette folding
- Covers and accompaniments

Unit No.1.5 - Preparation for service

Periods: 90

Mise- en- scene
 Mise-en- place
 Briefing

Unit No.1.6 - Service procedures

Periods: 80

- Restaurant Procedures
- Receive and seat the guest
 - Taking an order
 - Service of food & beverage
 - Clearance of table
 - Deal with guest payment

Unit No.1.7- Communication for Guest Service Associate

Periods: 20

- Communication:
- Self introduction by students
 - Describing someone
 - Asking simple question
 - Greeting a person
 - Know more about each other
 - Talking about one's family
 - Tell about each other
 - Form teams/pairs
 - Telling the time

**MODULE 2
 COMMIS CHEF**

Unit No.2.1 - Introduction to food production

Periods: 30

Introduction to Food production



- Aims and objectives of cooking
- Effect of heat on food

Kitchen Layout

Kitchen staff hierarchy

- Staff hierarchy - English, French
- Workflow in a kitchen

Kitchen Equipments

- Large equipments
- Small equipments

Unit No.2.2 - Food Ingredients and Recipes

Periods: 10

Food Ingredients

Food groups

Food additives

Food adulteration, poisoning and intoxication

Recipes

Unit No.2.3 - Preparation and mixing ingredients

Periods: 20

Preparation of Ingredients

Mixing of ingredients

Unit No.2.4 Methods of cooking

Periods: 30

Methods of cooking food

- Dry methods of cooking
- Moist methods of cooking

Unit No.2.5 - Stocks, Sauces and Soups

Periods: 90

Stock

- White stock
- Brown stock
- Vegetable stock
- Fish stock

Sauce

Mother sauces-hot and cold sauces

Soup

- Thick soup
- Thin soup

Unit No.2.6 Vegetables, Salads and Egg preparations

Periods: 80

Vegetables

- Classification of vegetables
- Vegetable cookery

Salads

- Parts of salads
- Salad dressing

Eggs

- Egg cookery

Unit No.2.7 - Non- alcoholic beverages and Snacks

Periods: 80

Non-alcoholic beverages

- Tea
- Coffee
- Juices/mock tails

Snacks

- Indian snacks
- International snacks

GRAPHIC DESIGN & PRINTING TECHNOLOGY

MODULE 1 GRAPHIC DESIGNING & DTP

1.1 Introduction to Printing

Origin and development of Printing

- Definition of printing
- Brief history of printing
- Developments in printing
- Influence of printing in human development
- Classification of Printing
- Conventional/Impact Printing (with Master)
 - * Relief - Intaglio - Planography - Screen
- Non Impact printing (without Master)
- Electrophotography - ionography - magnetography - Inkjet - Thermography - Photography

Print production work flow

- Idea and Concept
- Creative Production
- Industrial Production
 - * Prepress
 - * produce printing plates
- Printing
 - * select the apt printing process
- Finishing and binding
- foiling, varnishing, lamination cut to size, die-cutting,
 - * perforation and punchingfolding, creasing, binding, glue binding
- Logistics
 - * Distribution of the printed product to the end user
- Division of Printing Industry
- Printing Industry and Allied industry
- Printing Industry
- Allied Industries
 - * Trade Shops or Production Houses
 - * Supplies
 - * Sales and Service
 - * Equipment

* Related Areas

Print Media

- Books
- Magazines
- Brochures
- Newspapers
- Other Printed media
- Future of printing

Size of the Printing Industry**Job Opportunities and Entrepreneurship**

1.2 Computer Basics

Basics of Computer

- Computer Operation
- Software and Hardware
- Operating system/system software Data

Parts of Computer

- Components of computer
- Input device
- Output device
- LAN
- WAN
- MODEM
- Wireless Networks

Printers

- Dot matrix printer
- Ink jet printer
- Large format inkjet printer - Flex printing
- Laser printer

1.2 Typography and Word processing

Typography

- Type/ Font
- Classification of Typeface
- Design of typeface
- Point system
- Word Processing
- Word processing software
- MS Word
- Text file
- RTF / Rich Text Format and its advantages compared to text file



- Formatting of text is possible in RTF

Page Layout Software

- Adobe Pagemaker
 - * Advantages of page layout software over word processing softwares
 - * Text block, Frames
 - * Layers
 - * Mirror images, Flip etc
- Quark Xpress
 - * Advantages of Quark Xpress over Pagemaker

Typography

- Familiarise with fonts
- Familiarise with Point system
- Point, Pica, Leading, kerning, Tracking, Formatting

Type setting

- Modern typesetting
- Input via Keyboard
 - * Data Entry- English, Data Entry- Malayalam
- Modern typesetting
 - * Input via OCR
- Importing of documents / File transfer

1.4 Graphic Designing

- Design
- Principles of Design
- Balance, Dominance/Contrast, Proportion, Unity/Harmony
- Techniques of Design
- Tint, Surprint, Reverse. Bleed

Images for printing

- Types of originals
- Line original, Tone original
- Raster images
- Vector images
- Resolution
 - * DPI, PPI, LPI
- Image manipulation
 - * Cropping , Scaling
- Image editing software - advantages

Image formats

- JPEG, PDF, TIFF, EPS, PSD, PS, ZIP/RAR

3D image and object designing

- Applications of 3D Printing
- Software for 3D designing
- Autocad, Maya, 3D S max, 3D scanner

Publishing

- Book Publishing
- Different types of publishers
- House style
- Copy Editing
- Proof Reading
 - * Proof reading marks, Different types of proofs
- Parts of book
- E-publishing
- Outsourcing

Image Editing Software- Photoshop

Digital Photography

- Choosing the Camera Equipment
- The basics of photography
- Photo composition, Rule of thirds, Pan, Zoom
- Exposure in the camera
- Exposure triangle, ISO in digital photography, Shutter speed, Aperture
- Lighting for photography
- Getting the colour right
- Tips for photographing different subjects
- Introduction to white balance
- Editing your photos in Photoshop
- Introduction to digital camera models

1.3 Colours for Printing

Light and colour

- Electromagnetic Spectrum
- Wavelength of different colours
- Eye and the colour
- Colour Theory
- Additive colours
- Subtractive colours

Colour Psychology

- Warm Colour
- Cool Colour
- Neutral Colour



- Hue, Saturation, Value

Colour Printing

- Spot Colour
- Spot colour systems PANTONE & HKS
- Fake Colour, Duotone, Tritone, Process Colour, Hi Fidelity Printing,
- Colour Models
 - * CMYK, RGB
- RGB to CMYK conversion

Colour Separation

- Basic Colour Separation Theory
- Colour Filters
- Screen Angle
- Electronic Colour Separation
 - * Working of a scanner
- Colour Correction
 - * UCR, GCR

MODULE 2 DIGITAL PRE-PRESS PRINTING

2.1 Page layout and Imposition

- Traditional Image Assembly
- Page Layout
- Planning the job
- Imposition
- Font formats

2.2 Digital Pre press workflow & Output

- Workflow
- Pre-flighting
- Production Proofs
- Digital Pre Press Output
- Output to Film
- Offset Plate Making
- Exposure system
- Processing system

2.3 Computer to Plate

- Basic components of CTP
- Technology of CtP
- Imaging methods

- CtP for different Printing Processes
- Printing plates for Digital imaging
- Quality control in CtP

2.4 Computer to Print (NIP Technology)

- Principles & basic components
- Electrophotography
- Ionography
- Magnetography

2.5 Introduction to Offset Printing

- Principle of offset printing
- Four units of an offset press
- Cylinder configuration
- Operation of four units
- Web Offset

LIVESTOCK MANAGEMENT

Module 1 : BASIC ANIMAL HUSBANDRY PRACTICES

Unit 1 : Introduction to Animal Husbandry (40 periods) (4 scores)

Livestock statistics

- Current population status of cattle, buffalo, goat, sheep, pig, chicken, duck, turkey, quail.

Contribution of livestock to Indian Economy

- Current production status of livestock sector
- Impact of livestock sector on Indian economy

Common terminologies of Animal Husbandry

- Different terms associated with the husbandry of cattle, buffalo, goat, sheep, pig, chicken, duck, turkey and quail

Farming systems

- Farming systems and types of Dairy farming

Livestock farming

- merits and demerits
 - Advantages of rearing animals and birds
 - Disadvantages of rearing animals and birds

Unit 2 : Breeds of Livestock (60 periods) (6 scores)

Introduction to breeds

- Definition of breed , class, variety and strain
- Comparison of Indian and exotic breeds of cattle
- Classification and comparison of breeds according to origin and utility

Breeds of cattle

- Origin, breed characteristics and salient features of Sahiwal, Red Sindhi, Gir, Deoni, Hallikar, Kangayam, Amrit Mahal, Kankrej, Hariana, Tharparkar, Vechur, Kasaragod dwarf, Jersey, Holstein Friesian, Brown Swiss

Breeds of buffalo

- Origin, breed characteristics and salient features of Murrah, Surti, Jaffarabadi and Mehsana, Nili Ravi

Breeds of goats and sheep

- Origin, breed characteristics and salient features of Malabari, Attapady black, Beetel, Jamunapari, barbari, Saanen, Alpine, Boer, Kashmeeri, Marwari, merino etc.

Breeds of pigs

- Origin, breed characteristics and salient features of large white Yorkshire, Landrace, Duroc, Berkshire, Hampshire

Breeds of chicken

- Origin, breed characteristics and salient features of White leghorn, Black Minorca, RIR, New Hampshire, Australorp, Plymouth rock, Cornish, Brahma, Cochin, Aseel, Kadaknath, Naked neck, Austro-white, Gramapriya, Athulya, Giriraja

Breeds of duck, turkey, quail

- Origin, breed characteristics and salient features of Muscovy, White Pekin, Indian runner, Khakhi Campbell, Chara, Chemballi, Broad breasted bronze, Beltsville small white, Japanese quail, Bobwhite quail

Unit 3 : Restraining of Animals (50 periods) (7 scores)

Approaching the animal

- Animal behaviour
- Precautions while approaching the animal

Restraining of head and limbs

- Purpose of restraining
- Method of Restraining of head and neck
- Method of Restraining of fore and hind limbs

Whole body restraining

- Precautions for casting
- Reuff's method of casting
- Alternate method of casting

Instruments used for controlling animals

- Instruments used for controlling head, limbs and whole body
- The method of use of selected instruments like anti-cow kicker, milk man's rope, trevis and mouth gags

Unit 4 : Identification of Animals and Age Determination of Cattle (50 periods) (6 scores)

Introduction to identification of animals

- Purpose of identification
- Comparison of different methods of identification commonly used in animals

Commonly used methods of identification in animals and birds

- Hot iron branding, Chemical branding, Freeze branding, Tattooing, Tagging, Ear notching, Wing/leg bands, wing badges for birds, Electronic chips/transponders



Determination of age in cattle

- Importance of age determination in cattle
- Dental formula in cattle (permanent and deciduous)
- Age determination by looking at dentition
- Age determination by looking horn rings

Unit 5 : Anatomy and Physiology (100 periods) (12 scores)

Basics of anatomy and physiology with special reference to anatomical peculiarities of cattle, goat, pig, dog

- Definitions
- Anatomical Peculiarities (bone, RBC, liver, kidney, spleen, stomach)

Body parts of cattle

- Different body parts (regions, body cavities, joints, bones)

Normal physiological values of animals

- Significance of normal physiological values
- Normal range of values in cattle, buffalo, goat, pig, dog and chicken (temperature, pulse, respiration, age of puberty, rumen motility, gestation period, life span)

Measuring the most important normal physiological values of cattle

- Measuring Pulse
- Recording Respiration
- Recording rectal temperature
- Rumen motility
- Different conditions in which the normal values change

Structure and function of ruminant stomach

- Structure of ruminant stomach
- Process of ruminant microbial digestion

Structure and function of reproductive system of cattle

- Detailed structure and function of bovine female reproductive System
- Detailed structure and function of bovine male reproductive system
- Structure of bovine spermatozoa

Hormonal regulation of reproduction and oestrus cycle

- Hormonal interplay of female reproduction
- Hormonal interplay of male reproduction
- Sexual maturity and puberty
- Estrus cycle and heat signs

Structure and function of mammary gland

- Structure of udder

- Mechanism of milk production
- Hormonal role in lactation
- Peak production and drying up
- Milking methods
- Machine milking

Unit 6 : Rearing and Housing of Livestock (45 periods) (5 scores)

Establishment of livestock farm

- Requirements for dairy and poultry farms
- Systems of rearing for cattle
 - Free range system
 - Intensive system
 - Semi-intensive system
- Systems of rearing for poultry
 - Free range system
 - Intensive system (deep litter and cage system)
 - Semi-intensive system

Housing of cattle and poultry

- Requirements and dimensions of a standard cattle shed and poultry house
- roofing, flooring, sidewalls
- Hi tech dairy farm/ Milking parlour
- Mechanization of cattle farm
- Tail-to-tail system
- Head-to-head system

Manure and waste disposal

- Collection, storage and disposal of manure
- Vermi-composting
- Structure of Biogas plant

Module 2 : DAIRY AND MEAT ANIMAL MANAGEMENT

Unit 1 : Breeding and Reproduction in Animals (80 periods) (15 scores)

Basic concepts in breeding

- Genotype and phenotype

Selection and breeding methods

- Random selection, Individual selection, Family selection, Pedigree selection, Progeny testing, In-breeding, Out-breeding, Methods of cross breeding

Artificial insemination (A.I) in animals

- Purpose of A.I



- Semen collection and examination
- Semen extenders and preservation
- Familiarization of equipment used for A.I
- Heat detection
- Technique of A.I in cattle (Recto vaginal method)
- Speculum method for small animals

Pregnancy and parturition

- Basic concepts of gestation period, fertilization and placentation
- Pregnancy diagnosis
- Stages of parturition and signs of calving
- Difficult calving (dystocia)
- Involution of uterus, service period, inter-calving period, dry period

Embryo transfer technology

- Uses of embryo transfer technology
- Method of embryo transfer Technology

Infertility in cattle

- Concepts of infertility and sterility
- Causes of infertility

Unit 2 : Care and Management of Cattle

(50 periods) (7 scores)

Care and management of new born calves

- Importance of colostrum feeding
- Artificial respiration
- Cutting of umbilical cord
- Weaning
- Feeding of calves
- Dehorning
- Deworming
- Castration

Effect of climate on animals

- Homeostasis
- Critical temperature
- Summer management

Herd replacement

- Culling and replacement
- Methods of culling and replacement

Unit 3 : Principles of Feeding (50 periods) (4 scores)

Important nutrients required for animals -

- Water, Protein, Carbohydrates, Lipids, Vitamins, Minerals

Important concepts of feed formulation

- Proximate principles like Digestible crude protein (D.C.P), metabolizable energy (M.E), total digestible nutrients (T.D.N) etc.
- B.I.S specifications of feed
- Feed mixing

Different feed ingredients and preservation of fodder

- Concentrate feed ingredients
- Roughages
- Unconventional feed stuff
- Leguminous fodder (cow pea, subabul)
- Cultivation details of different fodder grasses (Guinea, Napier, para, congo signal)
- Preserved fodder (Silage, Hay, Straw)
- Nutrient enrichment of straw using urea
- Commercial feed for cattle (TMR feed, by pass protein feed)

Thump rules for feeding animals

- Maintenance ration for each category of animals
- Production ration for lactating animal
- Pregnancy ration
- Ration for draught animals

Unit 4 : Health Care (80 periods) (7 scores)

Health assessment

- Definition of health and disease
- Signs of health

Natural defense mechanisms

- Functions of different body parts in preventing disease

Routes of infection and classification of diseases

- Different ways in which micro-organisms enter animal body
- Types of diseases

Common diseases of animals

- Etiology, Important symptoms and control measures of
 - Bacterial diseases
 - Viral diseases



- Metabolic diseases
- Parasitic diseases
- Phyto and chemical toxicity in cattle

Control of diseases

- Treatment
- Disinfection
- Vaccination
- Quarantine
- Disposal of dead animals

Unit 5 : Husbandry of Goats (40 periods) (4 scores)**Introduction to goat rearing**

- Advantages of goat rearing

Care and management of different age groups of goats

- Housing requirements of goats
- Feeding of goats
- Care and management of kids
- Care and management of does and bucks
- Care and management of pregnant does
- Care and management of lactating does

Breeding and selection of dairy goats

- Selection methods
- Breeding methods

Diseases of goats

- A brief awareness on common bacterial, viral, metabolic diseases of goats and control measures

Unit 6 : Swine Husbandry (40 periods) (3 scores)**Introduction to swine rearing**

- advantages and disadvantages of pig farming

Housing requirements of swine

- general guidelines of housing
- space requirements for housing piglets, boar, sow, breeding animals

Age wise management of pigs (breeding boar, sow and piglets)

- Selection criteria for breeding boar
- feeding and management of boar
- feeding and management of female pigs (gilts, pregnant sows, farrowing sow)
- feeding and management of piglets

MARINE FISHERIES AND SEA FOOD

Module I FISHING TECHNOLOGY

- Unit 1.1: **Marine fishery resources of India**
Marine environment, Commercially important fishery resources
- Unit 1.2: **Fishing crafts and gear**
Fishing craft, Fishing gear and its operation, Fish finding devices and FAD's
- Unit 1.3: **Deep sea fishing**
Scope and opportunities of deep sea fishing, deep sea resources
- Unit 1.4: Navigation and seamanship
Navigational equipments and aids, Life saving appliances
- Unit 1.5: Conservation of fishery resources
Responsible fishing, Marine legislation.

Module II FISH PROCESSING TECHNOLOGY

- Unit 2.1: Nutritive values of fish
Proximate composition of fish- fish protein, fish lipids, vitamins & minerals, NPN compounds, importance of fish as food material
- Unit 2.2: Fish spoilage
Post mortem changes in fish, sensory evaluation
- Unit 2.3: Fish handling
Onboard and onshore fish handling, icing/chilling, cold chain
- Unit 2.4: Fish preservation methods
Basic aspects of fish preservation, traditional processing methods
- Unit 2.5: Fish drying
Principle of fish drying, solar/mechanical driers, common defects found in dried fish
- Unit 2.6: Freezing technology
Principle of freezing, different types of freezers; freezing of fish, prawn, cephalopods & crabs; common defects found in freezing

MARINE TECHNOLOGY

Module I

MARINE WORKSHOP PRACTICE

1.1 OPERATIONAL SAFETY AND PRECAUTIONS.

Introduction-Basic safety - Need for safety in Marine workshop.

Safety or general precautions to be observed in the floor shop

Study of personal protective equipments used in marine plant

1.2 BASIC WORKSHOP DRAWING.

Fundamentals of workshop drawing (lettering, numbering , dimensions)

Projection of points - Projection straight line -Projection plane

Orthographic projection objects Isometric and sectional views of solids.

1.3 MARINE FITTING WORKSHOP

Measuring Tools - Steel rule, try square, vernier calipers, micrometer (inside & outside), transfer calipers (inside & outside), feeler gauge.

Marking tools - V block, surface plate, scribe, dot , prick centre and hole punch.

Cutting tools -Theory regarding files, nomenclature, types. Care and handling of file and methods of filing Hack saw -Nomenclature of hack saw, types of hack saw frame (fixed frame and adjustable frame), types blades. Hack saw cutting practice (MS rod) Chisel, types of chisel - its uses.

Striking tools- Nomenclature, different types and its uses - handling.

Holding devices - bench and pipe vice -Other holding devices -combination plier, nose plier, cutting plier and circlip plier- handling, V cutting square cutting on MS flat as per drawing.

General purpose tools- screw driver, spanner- double end open mouth and ring, tubular socket or box Combination, adjustable spanners and handling. Thread cutting tools - Taps and dies.

Special purpose tools- Piston ring compressor and extractor, torque wrench, pipe wrench, bearing extractor or puller, magneto puller.

1.4 INTRODUCTION OF MARINE ENGINES

Introduction - Marine engines

Thermodynamics system - Definitions of thermodynamic system, open closed and isolated Thermodynamic properties - Definition of thermodynamic properties

(Intensive and extensive) - temperature, pressure, volume, entropy, heat, density, work, energy, enthalpy Thermodynamic process - isobaric, isochoric, isothermal, adiabatic and polytropic.

Thermodynamic cycle - Otto, Diesel cycle

IC engines - Fundamentals of IC engine- heat engine classification -external combustion, internal combustion engine-based on ignition, stroke and number of cylinder. IC engine terminology - TDC, BDC, Stroke length, Swept volume, Clearance volume, Total cylinder volume, Compression ratio, engine power-IHP,BHP,FHP, and Mechanical efficiency.

Module 2

OUT BOARD MOTOR SERVICING

2.1 SPARK IGNITION ENGINE

SI engine description - working of 2 stroke SI engines, working of 4 stroke SI engines. SI engine parts - cylinder block- cylinder head- Piston-connecting rod-crank shaft - crank case-oil sump- piston pin -cam shaft- valves- flywheel - Timing gear Classification of SI engines - Differentiates between 2 stroke and 4 stroke engine parts

2.2 OUT BOARD MOTOR

Out Board Motor - General description -its external parts

OBM installation

OBM fuel system - functions - parts(carburetor, fuel tank, fuel lines, fuel pump, reed valve and hand squeeze pump) - it's working - Carburetor and fuel pump servicing

OBM ignition system - function - parts (Stator coils, rotor, CDI unit, ignition coils, ignition switch and spark plug) - its working

OBM cooling system - function - parts (strainer, cooling water pipe lines, and pump) -it's working

OBM lubrication system -Petroleum system - 4 stroke OBM pump lubrication system - function - parts (oil filter, strainer, oil lines and pumps) - its working - overhauling of lube oil pumps- lube oil changing

OBM transmission system - function - parts (bevel gears, dog clutch, clutch rod, gear shifter, push rod, transmission shaft) - its working- gear oil changing - Overhauling of OBM transmission system

2.4 OUT BOARD MOTOR MAINTENANCE

OBM Maintenance - Need for OBM maintenance

Type of maintenance - Daily, periodical, breakdown

OBM Overhauling -skill for decarburization, measure cylinder wear and its



rectification (cylinder reboring), connecting rod bend checking, crankshaft run out measurement, Compression Pressure Checking & valve lapping.

2.5 OUT BOARD MOTOR FAULT DIAGNOSIS AND RECTIFICATION

Related to engine starting 1.Failure of the starter 2.Failure of ignition system 3. Failure of the fuel system 4. Engine struck due to (a. piston pin circlip, jumps out, b. cooling system failure, c. lubrication system failure and d. main bearing seizure)

Engine starts but stops suddenly a. Fuel system failure b. Ignition system failure

Engine starts but irregular idling speed a. CDI unit failure b. faulty carburetor c. valve clearance not set correctly/ valve leakage for 4stroke engines only

Engine starting but does not achieve speed - the causes and remedies of a. fuel system failure b. Ignition system failure

Troubles related to cooling system - Engine over heating a. cooling pump not working b. strainer block c. cooling water passage block or leakage

Problems related to combustion a. Black smoke b. White smoke c. Blue smoke (4 stroke engines only) c. Low mileage d. Knocking

Related to transmission system - a. gear shifting hard b. gear shifting not possible c. Humming noise

MARKETING & FINANCIAL SERVICES

Module - I

MARKETING AND SELLING

Unit 1 Fundamentals of Marketing and Selling (30)

Marketing—meaning and importance—functions—market—concepts—features—classification—selling—meaning—difference between marketing and selling.

Unit 2 Understanding Customers (40)

Customer—meaning and importance—classification—customer relations—meaning and importance—customer service—consumer behavior—factors influencing consumer behaviour—Market segmentation—bases of segmentation—target marketing—Market positioning.

Unit 3 Marketing Mix strategies (90)

Basic elements of marketing mix—Product—features—classification—Product mix—Branding—types—essentials—trade mark—Packaging—functions and types—Standardization—importance—approved agencies—Product Planning and development.

Price—objectives and importance—factors affecting pricing—Procedure and methods of pricing-

Supply chain -need and importance—storage and warehouse—functions and types—transportations—types and choice of transportation .

Channel of distribution—types—mode of selection of channel- Sales promotion—Meaning- importance -consumer, dealer,sales force promotion- Advertising—Meaning and importance—advertisement copy—values of a good advertisement copy - Media—Media selection

Personal Selling - Salesmanship—qualities of a good salesman—Personal grooming and hygiene.

Unit 4 Technique of Selling (90)

Selling Process—Prospecting—Methods—Pre approach—approach—methods—presentation and demonstration—handling objections—methods—closing the sale-sales talk—essentials of a good sales talk—sales reporting.

Unit 5 Communicating with Customers (60)

Role of communication in marketing—Mode of communication—Direct personal and written communication—Managing communication for effective marketing.



Unit 6 Recent trends in Marketing (30)

Event Marketing—importance—types of events—steps in event Marketing-
Social media Marketing—Meaning -Features—Applications— Viral
Marketing- Green Marketing—meaning and importance- Ethics in
Marketing.

Module - II

COMPUTER APPLICATION AND E-COMMERCE

Unit 1 Information Technology (30)

Introduction to Information Technology - Data processing - characteristics of computers - Evolution of computers - Classification of computers - Hard wired programming and stored program concept - Computer Organisation - Computer as a data processing machine - Basic computer operations - Functional units - System components - Input/ Output Ports (I/O Ports) - Microprocessor - The Memory - Memory organisation - Types of memory - Advanced portable storage devices - Memory hierarchy - Input /Output Devices - Computer Software - Software - Classification of software - Malicious Software - Copyright - Software Piracy Licensing - Free software philosophy - Application of Information Technology - Communication - Business - Medicine and Health care - Entertainment - E-Governance - Education - Engineering manufacturing - Science - IT policy in Kerala state.

Unit 2 Computer Hardware and Operating System (50)

Components of a Personal Computer - Parts of a personal computer - Booting - BIOS - POST - Disk Operating System - Windows 7 OS - Basic file and folder operations - Accessories - Installing and Managing Windows 7 - Steps to install Windows 7 - Hard drive preparation - Formatting - Device Driver - Installing a printer driver - Changing file views in windows7 - Control panel - User creation and rights - Trouble shooting - Creating start-up disk - Sharing files - Internet connection and Firewall -Windows Explorer- Installing MS office- Installing DTP software - Installing Tally - Maintaining Computer Software - Transferring computer data - Maintaining computer software.

Unit 3 Office Automation (90)

Office Automation basics - Concept of office -Nature of work in office - Need for office automation - MS Word- User interface of MS word - Creating a document - MS Excel - Starting MS Excel - User interface of MS Excel- The work sheet - Formulae - Sorting - Working with chart - MS Power Point - Creating presentation in different ways - Inserting a new slide - Adding themes - Saving a presentation- Set up the show - MS Access -Advantages of DBMS - Data Models - Terminologies used in RDBMS - MS Access - Creating a query in the query design option - Creating a form using Form wizard - Reports - Import - MS Outlook

Unit 4 Linux and Open Office (40)

Introduction to Linux -History of Linux - Advantages of GNU Linux - Linux file system structure - Linux Kernel - Login and logout in Linux - Linux command - Open Office Writer - Introduction to Open office - Apache Open Office - System requirement Starting Open Office Writer - Advanced features of Open Office Writer - Character Formatting - Background Colour - Paragraph Formatting - Bullets and Numbering - Indents - Creating an index of a document - Open office calc -Selecting cells - Cell formatting - Inserting Rows/Columns - Built in functions - Charts in Calc - Addressing Cells - Data Range - Work sheet -Auto fill – Filter - Data Sorting - Totals and sub totals - Protection - Open office Impress - Important features of Impress - Bringing different objects into slides - Adding Text - Different views - Adding New Slides to your Presentation – Background - Slide Transition -Animating objects in a slide -Watching slide show.

Unit 5 Internet and Malayalam computing (80)

Introduction Computer Networks - LAN Topologies – Protocols - Connectivity devices -Windows 7- Firewall Settings - Internet and E-mail - History of the Internet - Connecting Computer to Internet Connection - World Wide Web (WWW) - Web Browser - Search Engines - Email (Electronic mail) - Creating and using free email account with Gmail - Types of Internet Web page Designing – HTML-Starting with HTML - Attributes of <HTML> tag

Malayalam Computing - Malayalam through Computers - Free Software and Language Computing - Malayalam and Technology - Malayalam digital Technology – Unicode -Malayalam Using Transliteration - Malayalam Word Processing - Downloading and Installing Malayalam Fonts - Installing Fonts in Windows - How to enable Malayalam in Web Browsers? - Malayalam in UBUNTU - Malayalam keyboard and Typing - Ethical and Social Issues in Information Systems.

Unit 6 Marketing and e-commerce (50)

Introduction to e-commerce - Meaning and Concepts - e-business and e-commerce - EDI – Importance, features and benefits of e-commerce- Impact, challenges and limitation of e-commerce - e-commerce structure - Business models of e-commerce - Business to Business - Business to Customers - Business to Government - Government to Society (e-governance) - Designing of website for e-commerce - Components of website - Concepts and designing website for e-commerce - Corporate website – Portal – Search engine - Internet Advertising - Emergence of the internet as a competitive advertising medium - Models of internet advertising- Mobile commerce - Electronic payment system - Online payment system - Prepaid and post paid payment system – e-cash e-cheque, smart card, credit card, debit card, electronic purse - Security issues and solutions on electronic payment system - Biometrics and type of biometrics - Digital signature- digital certificate -Encryption, Description, public key and private key.

MEDICAL LABORATORY TECHNOLOGY

MODULE 1

ANATOMY, PHYSIOLOGY AND PHLEBOTOMY - 340 periods

Unit No.	Name of Units	Periods
1.1	Basic Anatomy and Physiology	100
1.1.1	Organisational Structure of human body <ul style="list-style-type: none"> • Familiarisation of cell, Tissue, Organ and Organ system, Definition & their relationship, Tissue types - Epithelial, Muscular, Connective, Nervous (Name only), Organ system (Name only) • Familiarisation of common terms - Anatomy, Physiology, Cytology, Histology, Pathology, Anatomical position, Anterior, Posterior, Medial, Lateral, Proximal, Distal, Central & Peripheral 	
1.1.2	Systemic Anatomy <ul style="list-style-type: none"> <i>Skeletal system</i> <ul style="list-style-type: none"> - Functions - Bones of Axial & Appendicular skeleton (Name only) - Terms-Cartilages, joints, Osteology, Arthrology <i>Circulatory System</i> <ul style="list-style-type: none"> - Cardio vascular system - Difference between artery, vein and capillary - Structure of heart in brief Chambers, Valves & Blood vessels (Name only) - Systole, Diastole & Cardiac cycle - Measurement of BP and Pulse - ECG-definition and importance - Lymphatic system in brief - Familiarize Lymph <i>Respiratory system</i> <ul style="list-style-type: none"> - Overview (Name of Parts & function) - Types of respiration - Respiratory rate (Definition & Normal value) - Spirometry - Use - Vital capacity-Definition & Normal Value - Clinical importance of Sputum <i>Digestive system</i> <ul style="list-style-type: none"> - Overview (Name of Parts & function) - Liver and Pancreas-Importance, Secretions 	

- (Name only) & function
- Clinical importance of Faeces
- Excretory system*
- Modes of excretion (specify names)
- Urinary system - Parts and function
- Formation of urine (name of steps only)
- Normal Constituents of Urine
- Clinical importance of Urine
- Nervous system*
- Name of Parts & function-CNS & PNS
- CSF and its Clinical importance
- Reproductive system*
- Parts & Function of Male reproductive system
- Parts & Function of Female reproductive system
- Clinical importance of Seminal Fluid
- Endocrine system*
- Overview
- Mention endocrine glands
- Mention Hormones of clinical importance and their functions (Pituitary, Thyroid, Adrenal, Pancreas & Gonads)
- 1.2 Diagnostic laboratory 140**
- 1.2.1 Introduction to Diagnostic laboratory
 - Significance of Medical Laboratory Technology
 - Role of Laboratory
 - Types of Laboratories
 - Sections of a Laboratory
- 1.2.2 Common Laboratory Glass wares & Lab Equipments
 - Common Laboratory Glass wares*
 - Common glass wares and its uses
 - Cleaning of glass wares
 - Preparation & use of Chromic acid solution
 - Common Laboratory Equipments*
 - Use, parts, working and maintenance of Microscope, Centrifuge, Colorimeter, Chemical Balance, Micropipette & Water bath
- 1.3 Introduction to Blood & Phlebotomy 105**
- 1.3.1 Blood
 - Introduction - Formation of Blood
 - Definition of Erythropoiesis, Leucopoiesis & Thrombopoiesis
 - Composition and functions of blood
 - Plasma & Formed elements



- Plasma-composition
- Formed elements RBC, WBC & Platelets
- Blood coagulation
 - Definition, Name coagulation factors
 - Major steps
 - Difference between Plasma & Serum
- Anticoagulants
 - Definition, common anticoagulants, colour coding
- Preparation of EDTA Anticoagulant bottle
- 1.3.2 Phlebotomy
 - Definition
 - Methods-Capillary puncture, Arterial puncture and Venous puncture
 - Sites of blood collection-capillary and venous
 - Requirement, Procedure of capillary & venous blood collection
 - Precautions for blood collection
 - Complications during blood collection-hematoma, syncope, Excess bleeding
 - Pediatric blood collection
- 1.3.3 Familiarization of Blood cells
 - Preparation of Thin blood smear
 - Ideal smear characteristics
 - Factors affecting smear preparation
 - Leishman's stain-staining technique
 - Blood cell types-RBC, WBC, Platelets
 - Identifying Characters & Normal range
 - Classification of White blood cells
 - Other staining methods-Fields, Giemsa, Wrights (Name only)

MODULE 2

Haematology & Blood banking techniques - 340 periods

Units	Name of Units	Periods
2.1	Haematology	240
2.1.1	Introduction to Haematology <ul style="list-style-type: none"> - Haematology-Definition - Role of haematological techniques in diagnosis 	
2.1.2	Hemoglobin estimation <ul style="list-style-type: none"> - Introduction - Methods 	

- Cyanmethaemoglobin estimation in detail
- Clinical significance
- 2.1.3 Total Cell Count
 - Introduction
 - Counting chamber - Improved Neubauer
 - Total Cell counts-RBC , WBC, Platelet, Absolute eosinophil
 - Diluting fluid, procedure, calculation, normal value, clinical significance
 - Reticulocyte count - brief description
- 2.1.4 Examination of Blood Smear
 - Differential Leucocyte Count
 - Thin blood smear Preparation, staining
 - Counting and reporting
 - Peripheral Smear Examination
 - Abnormal RBC - size, shape, colour
 - Abnormal WBC - general characteristics of Immature cells
 - Platelets - arrangement
 - Inclusion bodies - RBC, Parasites
- 2.1.5 Packed cell volume
 - Methods
 - Wintrobe's method - procedure, normal value, clinical significance
 - Red cell indices
 - MCV, MCH, MCHC,
 - Clinical Significance
- 2.1.6 Erythrocyte Sedimentation Rate (ESR)
 - Methods
 - Westergren's method - procedure, Normal value, clinical significance
 - Stages of ESR
 - Factors affecting ESR
 - Mention Automated ESR
- 2.1.7 Test for coagulation
 - Introduction - relevance, enlist various coagulation tests
 - Bleeding Time -methods, clinical significance
 - procedure, Normal value of Duke's method
 - Clotting Time-methods, clinical significance
 - procedure, Normal value of Capillary tube method
 - Prothrombin Time - brief description
 - APTT - brief description



- 2.1.8 Automation in Haematology
 - Introduction - need and advantage
 - Working principles
 - light scatter, laser, electrical impedance
 - Parts of analyser
 - Reagents - Diluent, Lyse, Rinse
 - Methodology
 - Parameters
 - Familiarization of terms - haemogram, histogram, CBC
- 2.2 Immunohaematology & Blood Banking Techniques 100**
 - 2.2.1 Introduction
 - Immunohaematology - Definition, Historical Aspects
 - Blood group antigens & Antibodies
 - Blood group system
 - ABO & Rh System in detail
 - Other blood group systems - Name only
 - Bombay blood group
 - Inheritance of Blood group
 - Haemolytic disease of Newborn
 - 2.2.2 Blood Grouping techniques
 - Cell grouping & Serum grouping
 - Slide & Tube method - Procedure
 - Mention Tile method
 - 2.2.3 Blood collection for Transfusion
 - Transfusion-Definition, Need
 - Donor, Recipient - Definition
 - Donor screening
 - Donor selection criteria
 - History of Donor & Medical examination
 - Blood collection Technique-Familiarize
 - Blood bag, Anticoagulants
 - Screening tests for Transfusion transmitted diseases
 - Storage - Blood bank refrigerator
 - Blood Components
 - Mention components name & its storage, use
 - 2.2.4 Compatibility Testing & Issue of Blood
 - Coomb's Test- Direct & Indirect
 - Cross matching
 - Major & Minor - mention 3 phases
 - Issue of Blood
 - Transfusion reactions - Name only

PHYSICAL EDUCATION

MODULE - I HEALTH AND PHYSICAL EDUCATION

1. Basics and History of Physical Education
2. (a) Philosophical Basis of Physical Education
(b) Themes of Play
3. Learning
6. Anatomy and Exercise Physiology
5. Teaching Methodology
(7) Kinesiology & Bio mechanics
7. Gymnastics
8. Track and Field - 1
9. Football
10. Volleyball
11. Specialization

MODULE - II ORGANISATION AND ADMINISTRATION IN SPORTS

1. Equipments and Facilities for Physical education
2. Organisation and Administration of Tournaments
3. Qualification and qualities of pe teacher and coaches.
4. General principles of officiating various sports and games
5. Play day (national, state, school sports day celebrations)
6. Kabaddi
7. Hockey
8. Basketball
9. Intramural
10. Specialization
11. Practice teaching (ojt) - 10 days



MODULE - III . HEALTH CLUB MANAGEMENT

1. Basics of sport psychology
 - i. growth and development
 - ii. personality, motivation
2. Recreation and minor games
3. Physical fitness and wellness
4. Sports training
5. Drugs and doping
6. First aid and sports injury management
7. Gym management and weight training
8. Aerobics (mass exercise)
9. Tae kwon do
10. Track and field-2
11. Badminton
12. Specialization
13. Practice teaching (ojt) - 10 days

MODULE - IV. HEALTH AND YOGIC SCIENCES

1. Fundamentals of yoga
2. Health education and personal hygiene
3. Posture
4. Nutrition
5. Yoga
6. Intramural
7. Cricket
8. Kho- kho
9. Handball
10. Specialization
11. Practice teaching (OJT) - 10 DAYS

PHYSIOTHERAPY

MODULE 1

BASICS OF HUMAN ANATOMY AND PHYSIOLOGY

UNIT 1.1 INTRODUCTION TO ANATOMY AND PHYSIOLOGY

- 1.1.1 Define Anatomy and Physiology
- 1.1.2 Define Anatomical Position,
- 1.1.3 Locate Regions and cavities of human body
- 1.1.2 Define Relationship of parts of the body
 - Proximal And Distal,
 - Superficial And Deep,
 - Ipsilateral And Contra Lateral.
- 1.1.4 Differentiate Directional terms-
 - Superior
 - Inferior
 - Anterior
 - Posterior
 - Medial
 - Lateral

UNIT 1.2 OSTEOLOGY

- 1.2.1 Define skeleton and explain the functions of skeleton
- 1.2.2 Classify of skeletal system-
 - Axial.
 - Appendicular
- 1.2.3 Classify of bones
 - Short bones
 - Long bones
 - Flat bones
- 1.2.4 Identify and describe the upper and lower limb bones
- 1.2.5 Define joints and classify the joints
 - Structural -cartilaginous, fibrous and synovial with examples
 - functional -movable, Immovable and partially movable with examples

UNIT 1.3 MYOLOGY

- 1.3.1 Name the Muscles of upper extremity, lower extremity and trunk
- 1.3.2 Identify the Nerve supply and Actions of upper, lower and trunk muscles

UNIT 1.4 BLOOD AND CARDIO VASCULAR SYSTEM

- 1.4.1 Name the Components and list out the functions of blood
- 1.4.2 Draw and label the Structure of Heart



- 1.4.3 Describe Systemic and pulmonary circulation
- 1.4.4 Define Cardiac cycle
- 1.4.5 Define and Detect Pulse and Blood Pressure
- 1.4.6 Explain Effects of exercise on cardiovascular system

UNIT 1.5 RESPIRATORY SYSTEM

- 1.5.1 Name the parts of Upper and lower respiratory tract.
- 1.5.2 Draw the Structure and list out the functions of Lungs
- 1.5.3 Define Inspiration and Expiration
- 1.5.3 Describe Lung volumes and capacities .
 - Tidal volume
 - Inspiratory reserve volume
 - Expiratory reserve volume
 - Vital capacity
 - Inspiratory capacity
 - Expiratory capacity
 - VO₂ max
- 1.5.4 Explain the Effects of exercise on respiratory system

UNIT 1.6 NERVOUS SYSTEM

- 1.6.1 Classify Nervous System
 - Central nervous system
 - Peripheral nervous system
- 1.6.2 Draw the Structure and list out the functions of Brain and Spinal cord
- 1.6.3 List out Cranial nerves and spinal nerves
- 1.6.4 Define Reflex action
- 1.6.5 Describe Motor and sensory pathway
- 1.6.6 Differentiate LMN and UMN lesion

UNIT 1.7 BASIC PATHOLOGY

- 1.6.1 Define pathology
- 1.6.2 Describe Normal cell and cellular adaptations
- 1.6.3 Define Cell injury
- 1.6.4 Differentiate Acute and Chronic inflammation
- 1.6.5 Define and classify diseases
- 1.6.6 Differentiate the types of Immunity
- 1.6.7 Define Basic pathological terms
 - Necrosis
 - Gangrene
 - Thrombosis
 - Embolism
 - Anemia
 - Shock
 - Hemorrhage

POLYMER TECHNOLOGY

Basic Polymer Processing (340 periods)

Unit 1 - Introduction to Polymers (15 periods)

Basic concepts of monomers and polymers

Define - Monomers, Polymers, Functionality of monomers, repeating units, Polymerisation, Addition and condensation Polymerisation

Classification and applications of polymers

Classification of polymers - Natural, Synthetic, organic, inorganic, homo polymer, copolymer, linear and branched polymers, thermosets and thermoplastics, Rubbers, Plastics, Fibres etc,

Molecular weight of polymers

Molecular weight of polymers - Concept of Average Molecular weight, Degree of Polymerisation, Molecular Weight Distribution, Practical significance of polymer molecular weight and molecular weight distribution

Unit 2 - Properties of Polymers (40 periods)

Characteristics of polymers

Characteristics of polymers such as Low Density, Low coefficient of friction, Good corrosion resistance, electrical insulation, surface finish, processibility, Economical, Poor tensile strength, Low mechanical properties, Poor temperature resistance, Attractive colours, Comparison with metals, wood etc

Structure and properties of polymers

Structure and properties of polymers Effect of Chain length, Side groups, Branching and crosslinking on the physical properties of polymers

Thermal and mechanical behaviour of polymers

Thermal behaviour of polymers Glass Transition Temperature T_g, Factors affecting T_g, Melting Point. Mechanical properties of polymers - stress, strain, modulus, toughness Creep and Stress relaxation

Unit 3 - Polymer Materials (120 periods)

Thermoplastic Materials

Production, Properties, grades, and applications of Thermoplastics such as PE, PP, PS, PVC, PMMA and PET

Thermoset plastics

Production, Properties, grades, and applications of thermoset resins like Phenol Formaldehyde, Melamine formaldehyde, Urea formaldehyde resins



General purpose rubbers

Production, Properties, grades, and applications of General purpose rubbers such as NR, SBR, Butadiene Rubber, EPDM and Reclaim rubber

Special purpose synthetic rubbers

Production, properties, Compounding and application of, NBR, CR, IIR, CSM, CM, ACM, Flouro carbon rubbers, Silicone Rubbers, and Poly urethane

Fibres

Production, Properties, grades, processing and applications of different fibres such as cotton, glass fibre, nylon, rayon, carbon, aramid and carbon fibres

Identification of polymers

Identification of CR, NBR, Silicone Rubber, Nylon, PVC, PP and PVC through visual inspection, response to heat and flame, elemental analysis and chemical analysis

Unit 4 - Polymer Additives

(50 periods)

Additives for Plastics

Additives for Plastics - Antioxidants, blowing agents, colourants, coupling agents, flame retardants, heat stabilisers, impact modifiers, lubricants, plasticizers, preservatives, UV stabilisers, etc.

Additives for Rubbers

Activators, Co activator, Antioxidants, Antiozonants-staining - non staining, fillers-reinforcing - non reinforcing, process aids, vulcanizing agents, accelerators-different types

Unit 5 - Polymer Processing

(85 periods)

Rubber Processing

Mixing - Mixing Mills, Internal Mixers, Moulding - Compression moulding, Transfer moulding, Injection moulding, Extrusion, Calendaring, Autoclave curing

Plastic Processing

Mixing - Plastic compound mixing, preparation of pellets, Moulding - Injection moulding, Blow Moulding Compression Moulding, Rotational Moulding, Extrusion, and thermoforming.

Unit 6 - Basic Engineering Drawing

(30 periods)

Drawing standards, Lettering and Numbering, Dimensioning, Projection of Points, Projection of Lines, Projection of Planes, Orthographic Projection of Objects, Sectional views, Isometric views

Module 2

Rubber Processing

(340 Periods)

Unit 1 - Natural Rubber

(60 periods)

History and development of Natural Rubber

History and development of Natural Rubber. Role of Columbus, Henry Wickhalm, Joseph Priestly, H.N. Ridley, Charles Goodyear, Thomas Hancock and JJ Murphy. World Production / Consumption statistics, Large Plantations in India, Geographical distribution, Climatic requirements and activities of Rubber board

Harvesting and preservation of Natural rubber latex

Tapping, Tappability, tapping systems, tapping utensils, knives, tapping task, tapping rest, yield stimulants and rain guarding. Puncture tapping, slaughter tapping, Field crops. Composition of latex, spontaneous coagulation. Preservation of latex- ammonia as a preservative, merits and demerits of ammonia. LATZ system

Concentration of NR Latex

Need for concentration of latex, DRC, Different concentration methods, Creaming process - creaming agents, theory, factors affecting the efficiency of creaming Centrifuging, - Process - Machines - skim latex and cenex, comparison of centrifuging and creaming

Preparation of Ribbed Smoked Sheets

Various steps, dosage of chemicals and acids, Same day and next day sheeting, drying in smoke houses, Grading

Manufacture of crepe rubber and technically specified rubber

Manufacture of pale latex crepe and estate brown crepe - processing and machineries Manufacture of TSR - Need for TSR, Comparison of TSR and sheet rubber. Different grades and technical specifications. Manufacturing process - equipment and testing.

Unit 2 - Rubber Compounding

(40 periods)

Rubber compounding

Definition, Objectives of rubber compounding. Sulphur vulcanisation - Different systems. Non sulphur vulcanisation systems

Compounding Ingredients

Vulcanising agents, accelerators - different classes - Amines, Guanidines, Thiazoles, Sulphenamides, Thiurams, Dithiocarbamates, and xanthates, Primary and secondary accelerators.

Activators, Co activators, Anti oxidants/ ozonants - SP, Hindered phenols, TMQ, PBN, 6PPD, IPPD

Fillers - Reinforcing fillers - Carbon blacks and silica Non reinforcing fillers - China



clay, Calcium carbonate, Whiting, Aluminium silicate, barytes etc. Effect of particle size on reinforcement. Process aids - Process oils- aromatic, naphthenic, and paraffinic, Plasticizers -DOP, DBP, CPW, Factice Special purpose additives - Blowing agents, fire retardants, retarders etc.

Design of rubber compounds

Design of rubber compounds with various hardness using NR and different dosages of different fillers Design of NR compound for - good mechanical properties, good heat resistance

Design of good abrasion resistant rubber, Oil resistant compound for oil seals, Weather resistant compound using EPDM, Chemical Resistant Compound using IIR, IIR Compound for Automobile tubes. Design of fire resistant compound, Extrusion compounds using NR and EPDM, Design of FKM and Silicone compounds

Unit 3 - Manufacture of Latex Products

(80 periods)

Latex compounding principles

Preparation of solution, dispersion and emulsions, Ball mills and attritor mills, Factors affecting the efficiency of ball mill. Latex compounding, Wet weight and dry weight.

Manufacture of latex dipped products

Manufacture of dipped goods like Gloves - surgeons, examination, house hold and electricians gloves, Rubber band, Balloons and Finger caps

Manufacture of other latex products

Manufacture Latex thread, latex casting, Latex foam - Dunlop Process, Thalalay process, Latex cements and adhesives.

Unit 4 - Manufacture of Dry Rubber Products

(80 periods)

Rubber moulded goods

Manufacture of different kinds of rubber moulded goods such as Diaphragms, Grommets, O-rings, Oil seals, expanded rubber sheets, footwear soles and other automobile parts

Manufacture of Conveyer belt and power transmission belts

Manufacture of Conveyer belt - applications- Different structures and reinforcements. Manufacture methods, Vulcanisation - step cure and Rotocure. V belts - Applications- Advantages Different types - Components of V belt, Manufacturing method, Vulcanisation

Manufacture of rubber hoses and cables

Manufacture of Garden hoses, Automobile hoses - Radiator hoses - components - tube, reinforcements and cover, Manufacturing methods - curing - lead cutting, autoclave curing, braided hose. Cables - Manufacturing process - Cross head dual

extrusion - Classification of cables, steam vulcanisation

Manufacture of rubber to metal bonded products

Rubber to metal bonding - Ebonite bonding, brass bonding, Adhesive bonding, Surface preparation

Manufacture of Rubber covered Rolls, Rubber lining of chemical tanks

Rubber to metal bonded automobile components - Shock absorber bushes, engine mountings etc

Common defects and remedies in the manufacture of Rubber Products

Shrinkage, Undercure, Sponging and porosity, Over cure, Air trapping, poor knitting or flow cracks, back grinding, tearing on removal from cavity, bloom, Excess flash, Distortion, sticking in cavity, poor registration of mould marks

Unit 5 - Manufacture of Tyres And Tubes (50 periods)

Introduction to tyres

Development of pneumatic tyres and its functions, Tyre components and its functions - Tread, Sidewall, Bead, bead apex, bead flipper, carcass plies, breaker plies, belt plies, chafer strips, inner liner etc Tyre constructions, Tread patterns, and Tyre Markings - Bias tyre, Radial tyre, bias belted tyres Lug Design, Semi lug design, and Rib designs Markings on a tyre and its interpretations

Tyre Building, curing and post cure operations

Preparation of different tyre components and their assembling in tyre building machine to complete the green tyre. Tyre curing and post cure operations

Manufacture of cycle tyres and solid tyres

Manufacture of cycle tyres - monoband building, Manufacture of solid tyres

Manufacture of Automobile Tubes & flaps

Manufacture of Automobile Tubes & flaps Suitable formulations for automobile tubes and flaps, Compound preparation, extrusion, cutting to lengths, valve holing, valve fixing, splicing, and molding

Tyre Retreading

Definition, need for retreading, advantages of retreading, Different methods of retreading - Conventional or hot process, - cold or pre cured process, Retreading process - inspection, buffing, cleaning, solvent application, cushion gum application tread application, vulcanisation and inspection

Unit 6 - Testing and Quality Control in Rubber Industry (30 periods)

Testing and latex and technically specified rubber

Latex testing - DRC, TSC, NH₃ Content, Coagulum content, Sludge content, VFA, MST, Dry Rubber Testing - Dirt content, P₀ -PRI, Ash content, Volatile matter, Mooney viscosity

**Rubber compound testing**

Density - Zinc chloride method, Mooney viscosity, Cure characteristics using rheometer.

Tests on vulcanised Rubber

Test on rubber vulcanisates Hardness, Tensile strength, Modulus, elongation at break, tear resistance, abrasion resistance, Compression set, Flex resistance - crack initiation and crack growth resistance, Rebound resilience,

Quality Management systems

Basic concepts of Quality management systems like Standard operating Procedures, Good manufacturing practices, 5S, Kaizen, ISO9000, QS9000, TS16949, TPM, TQM and ISO 14000

REFRIGERATION & AIR CONDITIONING

MODULE-1

Unit No: 1.1 Introduction to Refrigeration

Evolution of Refrigeration and Air conditioning-Refrigeration in daily life-Methods of refrigeration-Application/use of refrigeration

Unit No: 1.2 Engineering Drawing

Drawing standards-Lettering and Numbering-Dimensioning-Orthographic Projection of Objects-Projection of Points-Projection of Lines-Projection of Planes-Cross Sectional views-Development of Surfaces

Unit No: 1.3 Fitting

Study the application/use of fitting practice-Specification of fitting tools

Unit No: 1.4 Sheet Metal

Study the function, construction, working, use, and application-Specification of Sheet metal tools, instruments and equipment-Developments

Unit No: 1.5 Electronics

Basic electronic components-Basic Principles of semiconductors-Various sensors, remote control

Unit No: 1.6 Welding

Introduction to basic principles of Arc welding-Introduction to Oxy-acetylene welding processes and its regulator-Welding defects

Unit No: 1.7 Basic Refrigeration and Science Behind It

Function, working, use and specifications of refrigeration tools, instruments and equipment-Pressure & its measurements-Conversion table of different units of pressure-Heat and Temperature-Different temperature scales, Thermometers-

Units of heat-Sensible heat, latent heat, super heating and sub cooling-

Effect of pressure on saturation temperature-Vapourisation, evaporation, condensation.

Unit No: 1.8 Types of Refrigeration Systems

Simple flow diagram of Vapour compression refrigeration cycle-Simple flow diagram of Vapour absorption cycle-Ton of Refrigeration, COP, PH Diagram-Working of vapour compression cycle- low side & high side of vapor compression cycle-Applications of vapour compression cycle.

Unit No: 1.9 Refrigerants

Properties of refrigerants; Physical, chemical, thermodynamic-Primary and secondary- Classification of refrigerants-Halocarbon, Azeotrope, Zoetrope, Hydrocarbon, Inorganic-Chemical name and formulae of refrigerants-Designation of refrigerants. Leak detection methods. Alternative refrigerants. ODP, GWP and its

effects on environment

MODULE-2

Unit No: 2.1 Compressor

Function, construction, working, application of Compressor- reciprocating, centrifugal, rotary, scroll, screw type, wobble & swash plate-Wet & dry Compression- Lubrication oil; properties-Synthetic lubricants; Poly basic, poly alkaline-Lubrication Methods; Splash and forced feed.

Unit No: 2.2 Condenser

Function of condensers-Classification and applications of condensers-Air cooled; natural and forced, water cooled, shell and tube, shell and coil, tube within tube, Evaporative-Performance of a condenser; material used for construction, contact area and velocity of cooling medium.

Unit No: 2.3 Cooling Tower

Function and types of cooling towers; natural draft, forced draft cooling towers-Advantages of cooling towers

Unit No: 2.4 Expansion Valve

Functions of Expansion valves and its importance-Types and applications of expansion devices; capillary tube, Hand operated, automatic, thermostatic, float valves, electronic and solenoid valves-Criteria of locating and fixing thermostatic expansion valve; thermal bulb

Unit No: 2.5 Evaporator

Function of evaporators-Classification and applications of evaporators; flooded and dry expansion, bare tube, plate surface, finned, shell and tube, shell and coil-Natural and forced convection evaporator-Performance of an evaporator;Material used for construction, contact area, evaporator temperature.

Unit No: 2.6 Defrosting

Need of defrosting in refrigeration-Different methods of defrosting; manual, electrical, hot gas and reverse cycle.

Unit No: 2.7 Refrigerant Piping and Accessories

Piping materials-suction line-discharge line-liquid line-System accessories; oil separator, accumulator, refrigerant dehydrator, strainers, pressure relief valves, receiver tank-function, importance and application of accessories.

Unit No: 2.8 Common Refrigerating Machine

Domestic refrigerator-water cooler-deep freezer-walk-in cooler-cold storage-display case-ice cube maker-ice candy-ice plant-function and application of each machine.

TEXTILE TECHNOLOGY

MODULE - 1

TEXTILE FIBER

- 1.1 UNIT - 1 Introduction of textile fibers
 - 1.1.1 Definition of Textile Fiber, staple fiber and filament.
 - 1.1.2 Essential properties of Textile Fibers
 - 1.1.3 Classification of Textile Fibers
- 1.2 UNIT - 2 Vegetable Fibers (Cotton)
 - 1.2.1 Identify Cotton varieties and Explain the Cultivation of cotton fiber
 - 1.2.2 Explain the Physical structure and composition of cotton fiber
 - 1.2.3 Explain the physical properties of cotton fiber
 - 1.2.4 Explain the Chemical properties of Cotton fiber
 - 1.2.5 Explain the End uses of cotton Fiber
- 1.3 UNIT - 3 Vegetable fiber (Linen)
 - 1.3.1 Identify Linen varieties and Explain the Cultivation of Linen fiber
 - 1.3.2 Explain the Physical structure and composition of Linen fiber
 - 1.3.3 Explain the physical properties of Linen fiber
 - 1.3.4 Explain the Chemical properties of Linen fiber
 - 1.3.5 Explain the End uses of Linen Fiber
- 1.4 UNIT - 4 Animal Fibers(Silk)
 - 1.4.1 Identify the types of silk and Sericulture
 - 1.4.2 Explain the Extraction of silk filament from cocoon
 - 1.4.3 Describe the Physical structure of silk
 - 1.4.4 List the Physical properties of Silk
 - 1.4.5 Explain the Chemical properties of Silk
 - 1.4.6 Describe the End uses of Silk
- 1.5 UNIT - 5 Animal Fibers (Wool)
 - 1.5.1 Identify the types of wool
 - 1.5.2 Explain the Extraction of wool filament from Sheep
 - 1.5.3 Describe the structure and composition of wool
 - 1.5.4 List the Physical properties of wool
 - 1.5.5 Explain the Chemical properties of wool
 - 1.5.6 Describe the End uses of wool



- 1.6 Unit -6 Manmade fibers(Viscose, Nylon and Polyester)
 - 1.6.1 Manufacturing process of viscose rayon
 - 1.6.2 Physical and chemical properties of viscose rayon
 - 1.6.3 Manufacturing of Nylon
 - 1.6.4 Physical and chemical properties of Nylon
 - 1.6.5 Manufacturing of Nylon
 - 1.6.6 Physical and chemical properties of Nylon
 - 1.6.7 Explain the End uses of Viscose, Nylon and polyester

MODULE - 2

YARN MANUFACTURE

- 4.1 UNIT - 1 Yarn numbering, mixing and blow room process
 - 4.1.1 Explain the yarn numbering systems
 - 4.1.2 Describe English Cotton yarn count Systems
 - 4.1.3 Explain the Cotton quality characteristics and parameters
 - 4.1.4 Describe the Stack mixing methods
 - 4.1.5 Explain Blenders, Openers and cleaners for cotton fibers.
 - 4.1.6 Determine the Hank of Lap
- 4.2 Unit 2 Carding & drawing process
 - 4.2.1 Describe the Carding and stripping process
 - 4.2.2 Explain the revolving flat Carding machines.
 - 4.2.3 Mention the Combing Process.
 - 4.2.4 Explain the Drawing Process
 - 4.2.5 Explain the Drafting Systems in Drawing Frames
 - 4.2.6 Determine the draft & hank of Sliver
- 4.3 Unit - 3 Roving process
 - 4.3.1 Describe the simplex Processing.
 - 4.3.2 Explain the Drafting Systems in Simplex Frames
 - 4.3.3 Determine the hank of roving
 - 4.3.4 Determine the TPI.
 - 4.3.5 Differentiate roving winding
- 4.4 Unit - 4 Ring spinning
 - 4.4.1 Explain the basic concepts of Ring Spinning.
 - 4.4.2 Describe the Drafting Systems in Ring Frames
 - 4.4.3 Explain the functions of Ring ,Travelers and Spindle
 - 4.4.4 Determine the count of yarn
 - 4.4.5 Calculate the TPI
 - 4.4.6 Explain fundamentals of winding

TRAVEL AND TOURISM

UNIT 1 - Introduction to Travel and Tourism Industry

- 1.1 Tourism - Scope, Definition and importance.
- 1.2 Major types and forms of tourism and Emerging Trends.
- 1.3 The basic components and elements of tourism
- 1.4 Role of National Tourism Organisations in promoting tourism.
- 1.5 Tourism Terminology
- 1.6 Fundamentals: Data & Information, Computer Architecture, CPU & Memory Organization, History of Computer, Generation of Computer.

Practicals:

- 1.1 Introduction to use internet
- 1.2 Familiarise various search engines such as ted.org, Wikipedia, Google earth, edutoipa.org
- 1.3 Power Point and Chart preparation of components and elements of tourism.
- 1.4 Chart preparation of NTOs
- 1.5 Tourism Terminology: Visitor, Tourist, Excursionist, Day Tripper, International, domestic, inbound, outbound, Tour Itinerary, Package, Travel Agency, Tour Operator, Airline, Destination, Origin, Configuration, ETA, ETD, Charter flight, Cruise liner, Car rental,
- 1.6 Parts of computer , input , output device. Types of software's, Computer languages and operating systems

UNIT 2. Communication Skills in Travel and Tourism Industry

- 2.1 communications relevant to Tourism Industry
- 2.2 Meet and greet used in Tourism and Travel Industry
- 2.3 Personal Grooming
- 2.4 Sources of Information
- 2.5 Business Communication
- 2.6 Customer Care - meaning and importance
- 2.7 Operating System: DOS , Windows MS Office Word Excel Power Point Access

Practicals:

- 2.1 Audio-video presentation and interpretations, edu sat .com, Ted.com, news paper
- 2.2 Inviting guests, Meeting and greeting



- 2.3 Speech: Self Introduction session Handshakes- demonstration, body language
- 2.4 E- travel magazines, brochure preparation
- 2.5 Role plays- Front Office, TIC
- 2.6 Customer care videos
- 2.7 Key board familiarisation, power point - Report writing

UNIT 3. Destination Management

- 3.1 Types of Tourist Destinations
- 3.2 Local, State Tourist Destinations
- 3.3 Destination Facilitators
- 3.4 Impacts of Tourism: Social, Cultural, Economic, Environmental
- 3.5 Responsible Tourism in Kerala
- 3.6 Tourism Terminologies
- 3.7 Managing files, folders, features of word processing, Information Technology, internet and Web page designing

Practicals:

- 3.1 Field visit to nearby destinations
- 3.2 Picture album on various of tourist destinations, map work for identifying destinations, chart preparation, CD presentation, conduct an exhibition on based on the practical works done by the students.
- 3.3 Meeting tour guides and sharing experiences
- 3.4 Seminars, Case studies, Debates, Chart preparation based on impacts of tourism
- 3.5 Case studies based on responsible tourism in Kerala.
- 3.6 Prepare a tourism glossary
- 3.7 internet and web page designing based on tourist destinations, Procedure of manipulating text and formatting documents.

Module 2 -Travel Assistant

UNIT 1 Travel Essentials

- 1.1 Travel : Definition, Significance meaning
- 1.2 International Travel requirements
- 1.3 Motivation for Travel
- 1.4 Modes and means of Tourist Transport
- 1.5 Kinds of letters and govt.order , Table creation and mail merge, e-

mail Concepts , Basics of Sending & Receiving, E-mail, Free E-mail services

Practicals

- 1.1 Online passport application and formalities
- 1.2 Familiarisation of TIM- visa, health requirements, airport tax -a comparative study
- 1.3 Album preparation- Travel Through the Ages , Motivation for travel
- 1.4 Group discussion/ Debate/Album preparation on means and modes of transport - adv & dis adv
- 1.5 Govt. Letters and govt.order preparation, Table creation and mail merge, e-mail receiving and sending, free e-mail services.

UNIT 2 Travel Geography

- 2.1 Continents and Oceans
- 2.2 Travel Geography of Kerala and India
- 2.3 Major fairs and festivals, events, dance and music forms
- 2.4 Major airlines, airports cities of India and 3 letter codes .
- 2.5 Importance of Signage
- 2.6 Travel terminologies: Gateway, Infrastructure
- 2.6 Purpose and use of spread sheet, manipulating of cells, rows and columns

Practical

- 2.1 Preparation of facts file of Kerala
- 2.2 Map work - identification of districts, major rivers, lakes backwaters, hill stations , WLS, NPS, bird sanctuaries, tiger reserves, beaches, historical monuments, pilgrim centres, national highways, pilgrim centres.
- 2.3 Preparation of Tourist Circuits: prepare a tourist circuits from north to south and south to north. Picture album of major fairs and festivals of India.
- 2.4 Preparation of fact file of India : identification of states, major rivers, lakes backwaters, hill stations , WLS, NPS, bird sanctuaries, tiger reserves, beaches, historical monuments, pilgrim centres, national highways, pilgrim centres, 3 letter code of cities, airports
- 2.5 Identification of signage
- 2.6 Travel Glossary preparation
- 2.7 Chart preparation, Google map search



UNIT 3 Tourist Transport Facilities in India

- 3.1 Air Transport Operations: Charter and Scheduled, Domestic and International, Helicopters
- 3.2 Baggage system: FBA, EBA, Carry on items, Dangerous goods, Customs
- 3.3 Aircraft: wide and narrow body, parts
- 3.4 Sea Transport: Main ports, Passenger Ferries, Cruise ships, Seaplanes, Hovercrafts, Houseboats
- 3.5 Rail Transport: Passenger trains, Tourist Luxury Trains, Mountain trains, High speed trains, Metros, Suburban, Toy trains, Monorail
- 3.6 Special fares: Air, Rail
- 3.7 Road Transport: Tourist coaches, Prepaid Taxis, Car rental, bike hire, Caravans, Bicycle hire
- 3.8 Modern Trends: Airbus A380, Boeing Dream liner, High speed trains
- 3.9 Terminology: Transit Passenger, Stop over passenger, Stand by, Journey : Onaway, Return
- 3.10 Purpose and use presentation soft ware, Searching the Web, HTTP, URLs, Web Servers, Web Protocols. Web Publishing Concepts, Domain Name Registration, . HTML, Design Tools, HTML Editors , Image Editors

Practicals:

- 3.1 PPP in 5 major international airlines , five airports, 5 low cost airlines, Chart preparation on on charter flights
- 3.2 Chart preparation on carry on items and extra baggage allowance of various airlines, customs
- 3.3 Design a model aircraft using thermocol, airport visit
- 3.4 Map work of seaports and ppp of tourist facilities available in cruise ships
- 3.5 PP of various trains ad its facilities, picture album, route map of the luxury trains and heritage train service.
- 3.6 Chart work and news collection of special fares - Air, Rail
- 3.7 Quiz on the major air, rail and sea transport in india.
- 3.8 PPP showing facilities of modern trends in airline industry
- 3.9 Tourism glossary
- 3.10 Purpose and use presentation soft ware, Give a power point presentation related to tourism, Open and close a browser, Go to a web page by using links, enter and save URLs, Print a web page, Differentiate between internet and web.

Module 3 - Tour Escort

UNIT 1 Role and functions of Tour Assistant

- 1.1 Tour Assistant - Definition
- 1.2 Tourist Behaviour
- 1.3 Type of tour
- 1.4 Practicals : Adobe Page maker
 - a. DTP Working
 - b. Visiting card preparation
 - c. Wedding card preparation
 - d. Preparation of advertisement
 - e. Introduction to data base system concepts
 - f. Characteristics of data in data base
 - g. Advantages of different types of database systems.

UNIT 2 Tour Assistant- The Cultural Ambassador

- 2.1 Cultural Ambassador - Meaning
 - 2.2 Duties and responsibilities of Cultural Ambassador
 - 2.3 Skills, interests and Qualities
 - 2.4 Pre-Tour Briefing
 - 2.5 Tourist Ethics
 - 2.6 Recognition of Tour guides
- Introduction to photoshop
- a. Usage of basic tools and edge refinement isolate and edit parts of an image
 - b. Manipulate layers through positioning, scaling, rotation and adjustments.
 - c. Prepare images for web and printout with appropriate sizing and resolution
 - d. Apply painted masks, selection-based masks, gradient mask and blend modes to create image effect.

UNIT 3 Tourist Circuits

- 3.1 Tourist Circuit meaning
- 3.2 Major tourist circuits of Kerala and India
- 3.3 Guided Tour-Types : Guided Walking Tours , Coach Tours, Audio guided tours, Smartphone app tours

Practical:



- a. Introduction to coral draw
- b. Drawing lines, shapes, inserting pictures, objects, tables and tinplates.
- c. Creation of business cards, banners, books, brochure, logos and ID cards.

Module 4 - Online Travel Services and Computer Applications

UNIT 1 GDS

- 1.1 Define CRS
- 1.2 Define GDS
- 1.3 Advantages of GDS both for customers and Suppliers
- 1.4 On line Tourism Suppliers
- 1.5 Traditional brochures and online brochures
- 1.6 Virtual Tour
- 1.7 E-ticket, e-passport, e-visa

Practical

- a. Net working
- b. E-mail creation
- c. Browsing skill
- d. Fundamentals of web designing.

UNIT 2 Promotion and Sale of Travel and Tourism Products

- 2.1 Define Marketing
- 2.1 Importance of Tourism Marketing and promotion
- 2.3 Features of Tourism products and services
- 2.4 Marketing Mix
- 2.5 Promotion- meaning
- 2.6. Important Promotional tools

Practicals :

- a. Familiarise any CRS such as Amadeus, Galileo, Sabre
- b. Computerised Reservation System (Airline ticketing , Hotel reservation system , IRCTC)
- c. Travel portals : Make my trip, Yatra. Com, Travel Advisor.

ENTREPRENEURSHIP DEVELOPMENT

Total Hours 100

1. ENTREPRENEUR AND ENTREPRENEURSHIP

Hours 20

Entrepreneur - Concept - definition-features - significance of Entrepreneurship - function-process-quality of Entrepreneur - mind set of employees v/s entrepreneur- Entrepreneurship - Characteristics entrepreneur Vs Entrepreneurship- Intrapreneur -Myths of Entrepreneurship- Role of entrepreneurship in Economic development, challenges of Entrepreneurship- Social responsibility of Entrepreneurship

2. ENTREPRENEURIAL COMPETENCIES

Hours 20

Introduction – competencies of entrepreneurs-(1) Decision Making (2) Problem Solving (3) Risk Taking (4) Leadership(5) Communication(5) Dealing with customers, Entrepreneurial Values and attitude-motivation- Need Hierarchy Theory of Motivation - David MC lland Need Theory of Motivation- Life Skills - Managing Self and Others, Positive Attitude Creativity, Team Building and motivation

PRACTICAL: 1. Demonstrate and practice of five core life skills (a) Managing self and others (b) Positive Attitude , (c) Creativity (D) Team building (E) Motivation

3. ENTREPRENEURSHIP JOURNEY

Hours 20

Self Assessment of Qualities, Skills, Resources and Dreams

Identify your personality type before starting a business venture – Trailblazers, Go-getters,

Managers, Motivators, Authoritarians, Collaborators, Diplomats - Business Ideas- Generating Ideas- Ways to Generate Ideas- Environment Scanning- Creativity and Creative Problem Solving - Brainstorming- Focus Groups- Feasibility Study- Types of feasibility study- Market Feasibility- Technical Feasibility- Financial Feasibility- Organisational Feasibility- Features of Feasibility Study- Role of society and family in the growth of an entrepreneur- Rural Entrepreneurship- Agri-prenership – Social Entrepreneurship – Women Entrepreneurship- Student Entrepreneurship.

PRACTICALS: Test to assess the Entrepreneurial spirit of learner through questionnaire (Entrepreneurial Self Assessment Tool)



4. ENTREPRENEUR THE INNOVATOR

Hours 20

Innovations leading entrepreneurial ventures - the role of technology for Entrepreneurship development- social media in creating new forms of business organizations - networks and co-operative clusters - Concept of Risk Taking- Types of Risk Taking: Entrepreneurship Development Club - Entrepreneur Support Scheme(ESS). - Business incubation.

PRACTICAL: A SWOT analysis of entrepreneurial opportunity in your locality with reference to the vocational course.

5. ENTREPRENEURSHIP DEVELOPMENT PROGRAMME

Hours 20

Meaning-Objectives-Phases of EDP- steps in EDP-Problems in conduct of EDP-Strategies for Entrepreneurship development. Institutions in aid of Entrepreneurship Development Programme - Management Development Institute(MDI)-The National Institute for Entrepreneurship and Small Business Development(NIESBUD)-Entrepreneurship Development Institute of India(EDII) Science and Technology Entrepreneurship Parks (STEPS) -Use of IT enabled services in entrepreneurship - E Licensing, E filing.

MANAGEMENT

- 1 **Nature and Significance of Management** Management – concept, objectives, importance – Nature of management; management as a science, art and profession – process of management - Levels of Management; top, middle, operational- Scope of Management - Management vs. Administration.

(Periods 30)
- 2 **Evolution of Management Thought** Development of management thought - Classical approach: scientific, administrative, beaurocratic – Behavioural approach: group influence, Maslow’s need theory, theory X and theory Y, Hawthorne studies – Modern approach: system contingency, theory Z and quality management.

(Periods 16)
- 3 **Functional Areas of Management** Financial Management; meaning, importance, functions- fixed and working capital Human Resource Management; meaning and definition- managerial and operative functions. Production Management; meaning, production planning and controlling; stages – routing, loading, scheduling, dispatching, follow up and corrective action Marketing Management; meaning – approaches; production, product, selling, marketing.

(Periods 26)
- 4 **Recent Trends in Management** Strategic management, Strategic Group Mapping, SWOT analysis, BCG Matrix, Porter’s Five Forces Model, Core competency, McKinsey’s 7s framework - Retail management - knowledge process outsourcing - world class manufacturing, Total Productive Maintenance (TPM), Total Quality Management (TQM), Lean Production, Just in Time Production (JIT), Six Sigma, kaizen – Logistics and Supply Chain Management – Management By Objectives (MBO), Management By Exception (MBE).

(Periods 26)
- 5 **Managerial Decision Making** Meaning – types – characteristics – perspectives; integrative, inter disciplinary, interlocking, interpersonal – process of decision making – Economics as a tool for managerial decision making – Statistics for managerial decision making.

(Periods 16)
- 6 **Economics for Managerial Decisions** Meaning of Economics and Managerial Economics – scarcity - Economic principles relevant to managerial decisions - Demand and Supply Analysis - Demand; meaning and significance in managerial decisions- Demand determinants - Law of demand, exceptions to the law of demand - Supply; meaning and significance in



managerial decisions - Supply determinants - Law of supply, exceptions to the law of supply. (periods 36)

- 7 **Pricing Decisions** Price; meaning, price vs. value, pricing, Objectives and importance of pricing - factors affecting pricing decision – types of pricing. (Periods 16)

- 8 **Statistics for Managerial Decisions** Meaning; plural and singular, Scope and Importance. Data collection, Methods: Census and Sampling, sources of data: Primary and Secondary. (Periods 12)

- 9 **Organization and Presentation of Data** Organization of data - Stages in organization of data; Editing, Classification, Tabulation - Presentation of data, diagrammatical presentation of data; one dimensional, line diagram, simple bar diagram, multiple bar diagram, sub divided bar diagram percentage bar diagram, two dimensional; squares, rectangles, circles - three dimensional, Pie diagram - Graphical presentation of data; Histogram, Frequency polygons, Frequency curves, Ogives. (Periods 32)

(Total : Periods 210)