DIBRUGARH UNIVERSITY
(SYLLABUS)

**Broad outline of the Syllabus for the Post Graduate Diploma in Tea Technology and Plantation Management (PGDTTPM) course recommended in the 4th BOS meeting held on 19/05/2015, approved in the P.G. Board Meeting held on .....and meeting of the Academic Council held on .....**

**FIRST SEMESTER**

**COURSE No. TTPM-10100: - Introduction to Tea and Young Tea Management**

**COURSE No. TTPM-10200: - Agro-technology for Mature Tea**

**COURSE No. TTPM-10300: - Principles of Tea Manufacturing**

**COURSE No. TTPM-10400: - Organic Tea Cultivation and Speciality Tea Production**

**COURSE No. TTPM-10500: - Tea Cultivation (PRACTICAL)**

**COURSE No. TTPM-10600: - Tea Manufacturing (PRACTICAL)**

**SECOND SEMESTER**

**COURSE No. TTPM-20100: - Principles of Management**

**COURSE No. TTPM-20200: - Budgeting and Accounting in Tea**

**COURSE No. TTPM-20300: - Tea Economics and Marketing Management**

**COURSE No. TTPM-20400: - Personal Management and Industrial Management in Tea Industry**

**COURSE No. TTPM-20500: - Productivity and Quality Management**

**COURSE No. TTPM-20600: - Advance Tea Technology and Skill Development**

**MARKS DISTRIBUTION IN EACH PAPER:**

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|---|---|
| **End Semester Examination:** | **70 marks** |
| **In Semester:** | **30 marks** |
| **Total:** | **100 marks** |

**Note: Practical will be mostly field based and students shall have to visit Tea gardens on frequent intervals and shall have to collect data on the assigned subject. Report, presentation on practical etc. shall have to be submitted /presented by students individually**

# FIRST SEMESTER

## COURSE NO. TTPM-10100: INTRODUCTION TO TEA AND YOUNG TEA MANAGEMENT

1. Introduction to tea culture – early history, place of origin, distribution of tea areas in the world; cultivation of tea and its impact on economy.
2. Soil and climatic requirements for tea cultivation − climate of tea areas, tea soils and their management(composition of soil, soil texture, soil structure, soil profile, soil depth, soil pH, soil tilth, soil temperature, soil moisture, effects of climate on soil, organic matter management, soil testing and fertility management) and water management(drainage, irrigation and drought management) in tea.
3. Different methods of tea propagation, types of planting materials, vegetative propagation of clones(raising of mother bushes and clone nursery), propagation by seed(seed bari and seed nursery), silviculture of shade trees(importance of shade trees, selection of varieties and raising of shade tree nursery). Planning and cost computation for tea and seed nursery
4. Land preparation for extension and replanting, rehabilitation of uprooted areas, planting of tea under various planting designs and their comparative efficiency, layout of drainage system and cost computation for land preparation and drainage.
5. Young tea management and infill management in mature tea. Cost computation.

## COURSE NO. TTPM-10200: AGROTECHNOLOGY FOR MATURE TEA

1. Tipping and plucking of tea – principles of plucking, plucking standard in practice, plucking system, plucking rounds and their influence on crop and quality; mechanical plucking – type of plucking aids used and their merits and demerits.
2. Mineral nutrition in tea − essential plant nutrients, soil fertility and crop productivity, nutrient availability, need for fertilizer application, deficiency symptoms, ground application of fertilizers, foliar nutrition and improvement of soil fertility; steps to taken for tea soil conservation. Cost computation of tea nutrition.
3. Plant protection in tea − important tea pests, time of occurrence, nature of damage, control of tea pests(physical control with specified field management practices, chemical control, control with bio-agents and integrated pest management strategies); important tea diseases, time of occurrence, nature of damage, control of tea diseases(cultural control with specified field management practices, chemical control, control with bio-agents and integrated disease management strategies); control of pests and diseases in shade trees and green crop; weed control in tea, choice of herbicides and efficient weed control schedules. Cost computation for pest and weed management in tea and **Plant Protection Code (PPC) implemented by Tea Board on use of Plant Protection Formulation(PPF)**
4. Pruning and skiffing of tea, types of pruning and skiffing, effect pruning and skiffing on crop and quality, pruning cycle and their choices in different agro climatic conditions; rejuvenation pruning of old tea, cost computation of pruning. Cold weather practices.
5. Spraying equipment and their operations and maintenance, effective spraying techniques; use and abuses of agrochemicals with particular reference to pesticide residue in tea, Good Agricultural Practice(GAP)in the use of pesticides, MRL regulations and compliance.

**COURSE NO.TTPM-10300: PRINCIPLES OF TEA MANUFACTURING**

1. Bio-chemical constituents of green leaf and its changes during processing; introduction to different tea characteristics; ideas about CTC and Orthodox tea.
   Kinds of made tea: black tea, green tea, Oolong tea, instant tea.
2. Withering – introduction, importance, mechanism of withering, chemical withering, withering techniques, factors affecting withering.
3. Processing- Orthodox – rolling, importance, the rolling table & mechanism of rolling, factors affecting, period of rolling, and numbers of rolls. CTC – preconditioning, rotorvane, CTC machine and its functioning.
4. Fermentation – introduction, rate and period of fermentation, factors affecting fermentation. Drying – technology, factors affecting drying, different types of dryers.
5. Sorting and grading, storage and packing.

**COURSE NO.TTPM-10400: ORGANIC TEA CULTIVATION AND SPECIALITY TEA PRODUCTION**

1. Benefits and impact of agriculture on trade and industrial development, crop production and yield, Nature of soil fertility
2. Importance of microorganisms in agriculture, organic matter, decomposition cycles of matter in nature, biological nitrogen fixation, Vermi-compost and biofertilizer
3. Organic manure for tea plantations: Types, green manure, farm yard manure (FYM), farm compost, urban waste compost, rural waste compost, compost preparation. Merits and demerits of organic farming.
4. Machinery for micro and mini factories to process green tea, orthodox, CTC and specialty tea (Green tea, white tea Olong tea etc.), units and dimension, RPM, concept and operation of fixed-tray dryers.
5. Use of Solar energy in tea manufacture, tie up with solar energy unit for tea manufacture. Creation of motivation level to become future entrepreneurs in producing speciality tea

## COURSE NO.TTPM-10500: PRACTICAL ON TEA CULTIVATION

1. Introduction to different types of tea varieties: study and identification of different clones, and bi-clonal seed stocks in tea cultivation.
2. Nursery preparation for both seed and vegetative propagation. Study and work out the costing.
3. Land survey and land preparation, staking and planting operations of tea, study the drainage system followed in a tea estate. Work out the costing.
4. Identification of different fertilizers applied in tea cultivation. Prepare manuring program based on soil test report and yield. Work out the costing.
5. Identify different types of pruning and skiffing. Practice center out, re-centering out, level of skiff, light skiff, medium skiff, deep skiff, light prune, medium prune and rejuvenation prune.
6. Different types of plucking and plucking technique followed in tea. Practice a)black plucking, b) fine plucking, c) standard plucking, d) coarse plucking with breaking back and without breaking back, e) fish leaf and f) plucking over one leaf and study the composition of pluck shoots. Study plucking cost in a commercial tea estate.
7. Identification of temporary and permanent shade trees, green crops and rehabilitation crop.
8. Identification of different pests and diseases in tea field with its techniques of control along with the method used. Study pest and disease control costing in a commercial tea estate. Prepare a weed control schedule for young tea and mature tea with costing.
9. Sampling of soils for testing, soil testing for pH, organic carbon content, nitrogen, phosphorus, potash and Sulphur.

## COURSE No. TTPM- 10600: PRACTICAL ON TEA MANUFACTURING

1. Various methods to determine the quality of the green leaf which arrives in a tea processing unit and the methods to determine the leaf moisture content.
2. Study about different types of machineries used for Withering, Processing, Fermentation, Drying, Sorting and their operations.
3. Study about different types of made tea along with different grades available.
4. Study of the techniques of tea tasting along with the methodology adopted.
5. Factory management.
6. Calculations for various Factory capacities in Withering, Processing etc.
7. Calculations of RPMs of machines and drives.

# SECOND SEMESTER

## COURSE NO. TTPM-20100: PRINCIPLES OF MANAGEMENT

1. Organization structure and design in reference to tea industry.
2. Duties and responsibilities of a professional manager and managerial skills.
3. Planning, controlling, delegation and inter-department co-ordination in a tea estate
4. Manpower planning *'Kamjari'* programme – wage structure in tea,
5. MIS reports – (A) plucking chart; weedicides and pesticides; pruning and manuring programme etc. (B) manufacturing report; green leaf report; stock statements etc. (C) despatch and sales. Computerization.

## COURSE NO.TTPM-20200: BUDGETING AND ACCOUNTING IN TEA

1. Financial Management – nature, scope and objectives, capital structure and sources of finance.
2. Meaning of accounting, its concepts and functions, double entry system, ledger and journal, tribal balance, balance sheet. Accounts – cash book; bank book; ledger (general & party); account statements.
3. Cost concepts: Analysis and behavior, marginal costing and break-even analysis.
4. Budgeting and budgetary control.
5. Stores and inventory – stock statements; stock status; stores ledger; stock valuation etc.

## COURSE NO.TTPM-20300: TEA ECONOMICS AND MARKETING MANAGEMENT

1. Economics of tea production, land utilization pattern in tea estate, costs, cost of production and costing.
2. Recent trend of tea production in Assam and India, Tea Board and its functions, role of national banks in financing tea industry, tea statistics.
3. Factors affecting industrial productivity, tools and techniques used for higher productivity.
4. Different modes of tea marketing and advertisement.
5. Sales management in allied areas.

## COURSE NO. TTPM-20400: PERSONNEL AND INDUSTRIAL MANAGEMENT IN TEA INDUSTRY

1. Industrial relations – introduction, importance and impact; industrial disputes –nature and characteristics, causes and forms of industrial disputes. Basics of human resource management-Standing order, absenteeism, habitual absenteeism, authorized absenteeism & unauthorized absenteeism, Misconduct, strikes and disturbances- a brief introduction
2. Discipline – introduction, nature and characteristics, aims and objectives, disciplinary action, principles of disciplinary action, conciliation process.
3. Trade unions – introductions, nature and characteristics, objectives and functions, advantages and importance. Bipartite and tripartite dispute settlement. Labour welfare –introduction, objectives and importance. labour welfare officer – introduction, duties and functions.
4. Legal Acts related to tea industry- (a) The Plantation Labour Act, 1951, (b) The Factories Act, 1948 (c)The Industrial Disputes Act, 1947 (d) The Bonus Act, 1965 (e) Maternity benefit Act, 1959 (f) Workman compensation Act, 1926 (g) The Payment of Wages Act, (h) The Gratuity Act, (i) The Provident Fund Act
5. Grievance – introduction, nature and characteristics, causes, settlement procedure.

## COURSE NO. TTPM- 20500: PRODUCTIVITY AND QUALITY MANAGEMENT

1. Tea tasting, quality control and tea blending. Concept of quality, quality control in tea production. Recent trends in quality assessment by instrumental techniques.
2. Concept of modern tea processing: Computers in process control – (A) 'Auto weighing' of green leaf and subsequent feed into computers. (B) Computer controlled withering system; processing, fermenting and drying.
3. Energy conservation and integrated energy system for tea manufacture, energy analysis. PC-based monitoring and control system for critical unit operations in tea manufacture and **Energy management to minimize energy consumption in factory**
4. New approaches in Tea Management- Use of remote sensing and Geographic Information System (GIS) for land planning and drainage, soil and water conservation.
5. Tea Machineries – study of all types of tea machinery including Lathes, milling and chasing machines, importance of proper maintenance and off-season overhauling. Basic knowledge of various types of bearings, motors, drives etc.

**COURSE NO. TTPM-20600: ADVANCE TEA TECHNOLOGY AND SKILL DEVELOPMENT**

1. Overview on different aspects of Tea Husbandry and Specialty Tea Production
2. Overview on different aspects of Tea Manufacturing and management
3. Personality development- Meaning of personality; determinates and traits of personality. Meaning of attitude; formation of attitude; types of attitude; change of attitude. Meaning of values; types of values. Moods and emotions; felt and displayed emotions.
4. Communication skills- Basic forms and types of communication; verbal and non-verbal communication; formal and informal communication; communication barriers and means of overcoming such barriers; listening skills; audience analysis.
5. Interviews, Group discussion and presentations- Preparing for an interview, guidelines for the interviewer and the interviewee for an effective interview. Importance and characteristics of groups; advantages and disadvantages of groups; groups vs individuals. Meaning of discussion, techniques of group decision making. Definition and purpose of presentations; making an effective presentation.