M.TECH. IN ENGINEERING EDUCATION

SCHEME OF STUDY AND EVALUATION
FOR REGULAR AND MODULAR PROGRAMME
2010-11

Education and Educational Management Department,
National Institute of Technical Teachers’ Training and Research,
Sector 26, Chandigarh – 160 019.

March, 2010
# M.Tech. in Engineering Education (Regular) : Scheme of Study and Evaluation  
**2010 – 11**

**Note:**
- A student is required to study 12 courses of study (5 Core and 7 Electives), Preliminary Based Thesis Work and Thesis Work.
- A student can opt for two courses of study (Electives) from the relevant ME Programme offered by the institute as per his/her specialization.
- Coding system is as per the existing rules of Panjab University, Chandigarh (vide their circular No. 8404-63/GM dated 27.07.2004)

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Course of Study</th>
<th>Study Scheme</th>
<th>Evaluation Scheme</th>
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**FIRST SEMESTER**  
**CORE SUBJECTS (COMPULSORY)**
- **MTE 6101** Psychology of Adult Learning: 3 2 - 5 100 50 150
- **MTE 6102** Principles of Management: 3 2 - 5 100 50 150
- **MTE 6103** Performance Evaluation: 3 2 - 5 100 50 150

**ELECTIVE SUBJECTS (TWO OF THE FOLLOWING)**
- **MTE 6104** Instructional Design: 3 2 - 5 100 50 150
- **MTE 6105** Technical & Vocational Education System: 3 2 - 5 100 50 150
- **MTE 6106** Media Design and Development: 3 2 - 5 100 50 150
- **MTE 6107** Career Guidance: 3 2 - 5 100 50 150

**SECOND SEMESTER**  
**CORE SUBJECTS**
- **MTE 6201** Human Resource Development and Training Methods: 3 2 - 5 100 50 150
- **MTE 6202** Research Methodology: 3 2 - 5 100 50 150

**ELECTIVE SUBJECTS (THREE OF THE FOLLOWING)**
- **MTE 6203** Curriculum Development: 3 2 - 5 100 50 150
- **MTE 6204** Multi-Media Design and Development: 3 2 - 5 100 50 150
- **MTE 6205** Web-based Training: 2 - 3 5 100 50 150
- **MTE 6206** Education Project Planning & Management: 3 2 - 5 100 50 150
- **MTE 6207** Entrepreneurship Development: 3 2 - 5 100 50 150

**THIRD SEMESTER**  
**TWO ELECTIVE SUBJECTS AND PROJECT BASED THESIS WORK**
- **MTE 7101** Educational Technology: 3 2 - 5 100 50 150
- **MTE 7102** Organisational Behaviour: 3 2 - 5 100 50 150
- **MTE 7103** Technology Management: 3 2 - 5 100 50 150

**MTE 7151** Preliminary Thesis Work: - - - 15 - 100 100

**FOURTH SEMESTER**  
**MTE 7251** Thesis Work: - - - 25 - 100 100

**Note:**
M.Tech. in Engineering Education: Scheme of Study For Offerings
Modular Programme (2010-11)

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<tr>
<th>Code No.</th>
<th>Course of Study</th>
<th>Study Scheme</th>
<th>Evaluation Scheme</th>
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<tr>
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<tr>
<td>1.1 CORE COURSES OF STUDY (COMPULSORY)</td>
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<tr>
<td>MTE 6101</td>
<td>Psychology of Adult Learning</td>
<td>3  2 - 5</td>
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<tr>
<td>MTE 6102</td>
<td>Principles of Management</td>
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<tr>
<td>MTE 6103</td>
<td>Performance Evaluation</td>
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<tr>
<td>MTE 6201</td>
<td>Human Resource Development and Training Methods</td>
<td>3  2 - 5</td>
<td>100</td>
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<tr>
<td>MTE 6202</td>
<td>Research Methodology</td>
<td>3  2 - 5</td>
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<tr>
<td>1.2 ELECTIVE COURSES OF STUDY</td>
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<td>MTE 6104</td>
<td>Instructional Design</td>
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<tr>
<td>MTE 6105</td>
<td>Technical &amp; Vocational Education System</td>
<td>3  2 - 5</td>
<td>100</td>
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<tr>
<td>MTE 6106</td>
<td>Media Design and Development</td>
<td>3  2 - 5</td>
<td>100</td>
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<tr>
<td>MTE 6107</td>
<td>Career Guidance</td>
<td>3  2 - 5</td>
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<tr>
<td>MTE 6203</td>
<td>Curriculum Development</td>
<td>3  2 - 5</td>
<td>100</td>
</tr>
<tr>
<td>MTE 6204</td>
<td>Multi-Media Design and Development</td>
<td>3  - 2 - 5</td>
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<tr>
<td>MTE 6205</td>
<td>Web-based Training</td>
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<tr>
<td>MTE 6206</td>
<td>Education Project Planning &amp; Management</td>
<td>3  2 - 5</td>
<td>100</td>
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<tr>
<td>MTE 6207</td>
<td>Entrepreneurship Development</td>
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<td>MTE 7101</td>
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<td>Technology Management</td>
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<tr>
<td>MTE 7151</td>
<td>PRELIMINARY THESIS WORK</td>
<td>- - - 15</td>
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<tr>
<td>MTE 7251</td>
<td>THESIS WORK</td>
<td>- - - 25</td>
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</tbody>
</table>

Note:

- A student is required to study 12 courses of study (5 Core and 7 Electives), Preliminary Based Thesis Work and Thesis Work.
- A student can opt for two courses of study from the relevant ME programme as per her/his area of specialization.
- Coding system is as per the existing rules of Panjab University, Chandigarh (vide their Circular No. 8404-63/GM dated 27.07.2004.)
Fig. 1: Mode of Offering M.Tech. in Engineering Education on a Modular Basis.

**Note:**
- Fresh candidates during each spell will study the courses being offered in the running spell.
- A student is required to study 12 courses of study (5 Core & 7 elective subjects), Project Based Thesis Work and Thesis Work.
- A student can opt for two courses of study (Electives) from the relevant ME Programme offered by the institute as per his/her specialization.
- Coding system is as per the existing rules of Panjab University, Chandigarh (vide their circular No. 8404-63/GM dated 27.07.2004)

**SPELL – I**
- MTE 6101 & 6102

**SPELL – II**
- MTE 6201 & ANY ONE OF THE FOLLOWING ELECTIVES: MTE 6203, 6204, 6205, 6206 & 6207

**SPELL – III**
- MTE 6103 & ANY ONE OF THE FOLLOWING:
  - MTE 6104, 6105, 6106, 6107
  - OR
  - ANY ONE OF THE FOLLOWING:
    - MTE 7101, 7102 & 7103

**SPELL – IV**
- MTE 6202 AND ANY ONE OF THE FOLLOWING:
  - MTE 6104, 6105, 6106
  - OR
  - ANY ONE OF THE FOLLOWING:
    - MTE 7101, 7102, 7103

**SPELL – V**
- TWO ELECTIVES ANY ONE OF THE FOLLOWING NOT EARLIER OFFERED:
  - MTE 6104, 6105, 6106
  - AND
  - ANY ONE OF THE FOLLOWING:
    - MTE 6203, 6204, 6205, 6206 & 6207

**SPELL – VI**
- TWO ELECTIVES FROM THE FOLLOWING NOT EARLIER OFFERED: MTE 6203, 6204, 6205, 6206 & 6207
- AND
  - MTE 7251
  - Project Based Thesis (Compulsory)

- AND
  - MTE 7251
  - (Thesis) (Compulsory)
ACADEMIC RULES
FOR M.TECH/ME REGULAR & MODULAR PROGRAMMES

1. Duration of Programmes

i) For Regular M.Tech/M.E Programmes

The normal duration of M.Tech/ME Programmes including Thesis will be 2 academic years (4 semesters). The maximum period of completion of the programme including Thesis shall be 4 academic years (8 semesters). 2 years (4 semester) extension in genuine hardship cases is allowed by the Vice-Chancellor of Panjab University, Chandigarh for submission of thesis.

ii) For Modular M.Tech/M.E. Programmes

The normal duration of Modular M.Tech/M.E Programmes including Thesis will be 3 academic years, (6 spells, each spell of 5 weeks duration including Saturdays & Sundays). The maximum period of completion of programme including Thesis shall be 6 academic years (12 spells). 2 years (4 spells) extension in genuine hardship cases is allowed by the Vice-Chancellor of Panjab University, Chandigarh for submission of thesis.

2. Number of Theory Papers allowed in a Semester/Spell

i) For M.Tech/M.E. Regular Programmes

All students will be required to qualify twelve theory papers during the course. No student will be allowed to qualify more than 5 papers at the end of first semester and not more than 10 papers (including the papers passed in the first semester), at the end of second semester or first year. Two papers will be offered in the 3rd semester.

ii) For M.Tech/M.E. Modular Programmes

All students will be required to qualify 12 theory papers during the course. No student will be allowed to qualify more than two papers at the beginning of 2nd spell and not more than four papers (including the papers passed in the beginning of 2nd spell) at the beginning of 3rd spell and so on.

3. CONDITIONS FOR APPEARING IN END-SEMESTER EXAMINATION

i) Periodic Tests (for M.Tech/ME Regular Programmes)

Every student has to appear in two periodic tests as decided by the Institute and must qualify the same. There will be only one make-up test
for those students who are unable to appear in one or both mid-semester tests due to genuine reasons to the satisfaction of Coordinator.

Students, whose performance in the class-tests/sessionals is not satisfactory, are liable to be detained by the Director from appearing at the University Examinations. The detailed rules of the University Examinations are available at Panjab University, Chandigarh and all students are advised to get the latest copy for guidance and further information.

ii) **Periodic Tests (for M.Tech/ME Modular Programmes)**

Every student has to appear in one periodic test as decided by the Institute and must qualify the same. There will be only one make-up test for those students who are unable to appear in the test due to genuine reasons to the satisfaction of Coordinator.

Students whose performance in the test/sessional is not satisfactory, are liable to be detained by the Director from appearing at the University Examinations. The detailed rules of the University Examinations are available at Panjab University, Chandigarh and all students are advised to get the latest copy for guidance and further information.

4. **EXAMINATION AND RESULT (For M.Tech/ME Programmes both Regular and Modular)**

- Minimum marks to pass examination: 50% in the sessional in each subject and 40% in each theory paper. Both the theory and sessional marks will be considered independent of each other. Aggregate pass percentage will be 50% in each subject.
- Weightage in each subject
  - 50 marks : Sessional
  - 100 marks : Final theory examination
- The students who obtain in first attempt 75% or more of the aggregate marks in both theory and sessionals and also if the thesis has been adjudged to merit distinction are awarded First Division with Distinction. If the thesis has not been adjudged to merit distinction then the students are awarded first division.
- The students who obtain 60% or less than 75% of the aggregate marks in all theory papers and the sessionals are awarded First Division.
- The students who obtain less than 60% of the aggregate marks in all the theory papers and the sessionals but not less than 40% in each theory paper and 50% in the sessionals will be awarded Second Division.

**Preliminary Thesis/Thesis**

Four neatly typed or printed copies of Thesis properly bound, shall be submitted to the University through Guide and Academic Cell of the institute.
# MTE 6101  Psychology of Adult Learning

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>2006-2007</th>
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</thead>
</table>
| 1.     | Learning Theories  
Concept of Learning (Definition, Characteristics and process) and of theory.  
Theories based on mechanistic model of development (EL Thorndike, Ivan Pavlov, John B, Watson; Edwin R, Guthrie; Skinner’s operant learning):  
Theories based on organismic model of development (Edward C, Tolman; Gestalt and Bruner). | L  
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| 2.     | Theory of adult learning, Andragogy  
Theories of adult learning; contributions from social sciences and adult education. Andragogy Vs. Pedagogy, characteristics of Adult Learners.  
Andragogical theory of adult learning | 10 Hrs. |
| 3.     | Learning Cognitive Information  
Learning and organising new verbal information, Meaningful and rote learning;  
New concepts and existing conceptual structures | 10 Hrs |
| 4.     | Learning Cognitive Strategies  
Cognitive Strategies – concept and strategies; The process and phases of problem solving; Reproductive and productive thinking; Plans and control of behaviour, Problem solving and set strategies for productive thought; | 10 Hrs |
| 5.     | Learning Skills  
Nature of skill, Characteristics of skills, phases of skill acquisition/learning.  
Skilled and un-skilled performance; Hierarchical organisation of skills; closed-loop and open-loop control in skilled performance. Learning a skill:  
Information necessary for skill learning, knowledge of results and feedback;  
Transfer of training; The role of skill trainer | 10 Hrs |
| 6.     | Social Learning  
Influence on social behaviour, social groups, Socialisation, Affiliation, values,  
Attitudes and Opinions, Inter-personal attraction; Exchange Theory  
Group Norms: Reference, Groups  
Group structure and processes, Group Cohesion; | 9 Hrs |
### 7. Personality Differences and Cognitive Styles

Individual differences and Adult Learning – Intelligence (concept, theories and individual differences); Personality (concept, theories and individual differences); cognitive style (convergent and divergent thinking; curriculum-bound and curriculum – free learners; Serialist and Holist approach to learning; Field dependence and learning, Impulsivity and reflectivity); Ageing & learning; Motivation (concept, types, approaches and techniques of motivation and its influence on learning); and self concept & its influence on learning.

11 Hrs

### 8. Learning to learn

Concept and Strategies (Concept Mapping, Brain Mapping, Pattern Matching, Mnemonics, The method of loci, imagery, elaboration and paraphrasing, SQ3R, Problem Solving and Time Management Skills

10 Hrs

### 9. Theories of Instruction

Gagne Hierarchical Theory, Ausubel Advance Organiser Theory and Bruner Cognitive Development theory

10 Hrs

### Practice Tasks

- Developing learning structure for a course of study
- Measurement of attitudes and discussion of results
- Measurement of values and discussions of a results
- Measurement of intelligence and discussion of results
- Measurement of personality and discussion of results
- Measurement of cognitive style and discussion of results
- Measurement of motivation and discussion of results
- Measurement of self-concept and discussion of results.

### Recommended/Reference Books

1. Hurlock, EB (201), Personality Developments, New Delhi: Tata McGraw-Hill
<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>2006-2007</th>
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<tbody>
<tr>
<td>1.</td>
<td><strong>Introduction</strong>&lt;br&gt;Importance: need of management in all types of organisations at all levels.&lt;br&gt;Definition of management: its nature and characteristics&lt;br&gt;Evaluation of management thought:&lt;br&gt;Mechanistic approach: Contributions of Taylor and Fayol&lt;br&gt;Humanistic approach: Hawthorne studies Elton Mayo’s findings, Contingency approach: Concept and Significance</td>
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<td>2.</td>
<td><strong>Planning</strong>&lt;br&gt;Importance of planning&lt;br&gt;Nature and types of Plans&lt;br&gt;Models of planning&lt;br&gt;Strategic planning and management</td>
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<td><strong>Organising</strong>&lt;br&gt;Formal and informal organization&lt;br&gt;Organisational division: the department&lt;br&gt;Organisational levels and the span of management&lt;br&gt;Structure and processes of organizing&lt;br&gt;Organisational&lt;br&gt;Line/staff authority empowerment and decentralization&lt;br&gt;Delegation of authority</td>
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<td><strong>Effective Organising</strong>&lt;br&gt;<strong>Staffing</strong>&lt;br&gt;Performance appraisal,&lt;br&gt;and Career strategies</td>
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<tr>
<td>4.</td>
<td><strong>Decision Making</strong>&lt;br&gt;Concept, Types of Decisions – Programmed and Non-programmed, Routine and Non-Routine Decisions, Decision Making models – Classical, administrative and political&lt;br&gt;Steps in Decision Making&lt;br&gt;Increasing participation of employees in decision making – Vroom Jago Model, participative decision making</td>
</tr>
</tbody>
</table>
| 5. | **Communication**  
Importance and role of communication in organisations:  
Purposes of communication Communication process: Elements and Model,  
Flow of communication in an organization - Downward communications,  
Upward communication, Lateral/horizontal communication, Diagonal  
communication,  
Role of Formal/Informal, Verbal/Non-Verbal Communication: Barriers to  
Effective Communication; Increasing communication Effectiveness |
| 6. | **Motivation**  
Concept and types of Motivation – Intrinsic and Extrinsic,  
Content Theories of Motivation – Maslow’s Need Hierarchy, Herzberg’s  
Two Factor Theory, McClelland Three Need Theory.  
Process Theories of Motivation:  
Vroom’s Expectancy Theory and Adam Equity Theory, Porter – Lawler  
Model  
Skinner’s Reinforcement Theory  
Integrated Model of Motivation (Robins) |
| 7. | **Leadership**  
Nature of Leadership  
Leadership vs. Management – Position power, personal power,  
empowerment.  
Leadership Traits – Autocratic vs. democratic leaders, Behavioural  
approaches: Ohio’s State Studies, Michigan Studies, Leadership grid.  
Contingency Approach – Fiedler, Situational approach to Leadership |
| 8. | **Managing Change in Organisational Development**  
Manager as a Change Agent, Forces for Change, Resistance to change,  
Models of planned change, Techniques for managing change  
Concept and Models of OD  
Learning organization – Concept |
| 9. | **Methods and Techniques of Control**  
Types of Controls: Feed Forward Concurrent and Feedback Controls and  
Steps in Control, Characteristics of effective controls  
Gantt of Bar Charts  
PERT AND CPM  
Network development and analysis of CPM  
Total Quality Management Techniques |
<table>
<thead>
<tr>
<th>Practice Tasks</th>
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<tbody>
<tr>
<td>The following practice tasks will be undertaken by students individually or in groups.</td>
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<tr>
<td>• Delineating the functions performed by managers at different levels i.e. Institute, Department and Directorates</td>
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<td>• Study of organizational structure of technical education at the Directorate or Polytechnic level and identify its strengths and weaknesses</td>
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<td>• Critical analysis of cases related to decision making, problem solving, motivation, leadership etc.</td>
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<td>• Determining self leadership style and motivational level</td>
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</table>

**Planning, scheduling and controlling an educational project using bar charts and PERT/CPM**

<table>
<thead>
<tr>
<th>Books Recommended/Reference Books</th>
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<tbody>
<tr>
<td>4. Robbins, SP. Management, UK: Prentice Hall</td>
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<td>Sr.No.</td>
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</table>
Norms Referenced Tests (NRT)
- Evaluation of Practical work: Components and elements of Practical Work (Laboratory, Field, Drawing, Workshop and Project Work)
- Construction of Performance (Practical) Tests  

<table>
<thead>
<tr>
<th>5.</th>
<th>Item Analysis</th>
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<tbody>
<tr>
<td>Concept, item Analysis of CRT and NRT, (Computation of Item Difficulty level, discrimination index and effectiveness of distracters)</td>
<td></td>
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</tbody>
</table>
| Item Banks: Concept and Benefit, Steps in its Construction  
Item Files: Concept |

<table>
<thead>
<tr>
<th>6.</th>
<th>Standardized Tests</th>
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</table>
| Concept, Characteristics of standardized tests,  
Differences between standardized and classroom tests  
Types of standardized tests (Nature and concept), Construction and selection of standardized tests |

<table>
<thead>
<tr>
<th>7.</th>
<th>Interpretation of Test Scores</th>
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</table>
| Methods of Interpreting Test Scores: Criterion referenced Interpretation, Norm Referenced Interpretation)  
Norms: Meaning, differences between norms and standards, judging adequacy of norms, local norms  
Standard Scores: The normal curve and standard deviation unit, Types of Standard scores (z- scores, T-score, Normal curve Equivalent and Stannines) Percentile Ranks Comparison of Score System |

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<th>8.</th>
<th>Credit based system of evaluation:</th>
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<tbody>
<tr>
<td>Concept, Benefits, Features</td>
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Practice Task
- Practice exercises on construction of test items, rating scales, checklists and observation schedules  
- Practice exercises on item analysis and computation of a reliability and validity of test papers  
- Planning and construction of written test and checking its validity and reliability  
- Planning and construction of skill test and checking its reliability and validity  
- Study administration and interpretation of the results of standardized achievement and aptitude tests

Project Work
Construct model sessional test papers for any one of the subjects being taught – Write instructional objectives for the topics to be included in test, Prepare table of Specification, Marking Scheme.

Recommended/Reference Books
1. Assessment of Student Achievement Gronlund, Norman E, 208, Pearson Education (US)
5. Classroom Assessment:What Teachers Need to know by W. James Popham, Allyn & Bacon, 207 ebay.com
<table>
<thead>
<tr>
<th>S.No</th>
<th>2006-07</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Systematic Approach to Instructional Design</strong> – System’s Concept, Components of Instructional System, Steps in Systematic Approach to Instructional Design</td>
</tr>
</tbody>
</table>
| 2.   | **Theories of Instruction** – Salient features and implications of the theories of instruction  
Gagne Hierarchical Theory; Internal and External conditions of learning  
Bruner Cognitive Development Theory  
Ausubel Advance organiser Theory | 12 Hrs |
| 3.   | **Varieties of Learning and Conditions of Learning: Gagne Classifications** | 12 Hrs |
| 4.   | **Instructional Objectives**  
- Concept, Classification and Approaches to Writing Instructional Objectives | 12 Hrs |
| 5.   | **Task Analysis – Concept, Purposes and Procedure for Task Analysis.** | 10 Hrs |
| 6.   | **Instructional Strategies – Methods and Media. Large group methods of Instruction, Small group methods of Instruction and Individualized Methods of Instruction, Media – Concept, Classification, Characteristics, Advantages and Disadvantages.** | 20 Hrs |
| 7.   | **Planning for Classroom Instruction** | 8 Hrs |
| 8.   | **Evaluating Learning Outcomes – Cognitive, Psychomotor and Affective** | 6 Hrs |

**Practice Task**
- Task Analysis for a topic of study to identify different elements of knowledge, skills, theoretical structures.
- General and specific instructional objectives at the course, topic and lesson level.
- Planning alternate sequence of instruction for a subject of study
- Planning instruction for a subject of study including the following:
  - Drawing precedent diagram
  - Structuring content
  - Designing learning experience
  - Designing performance assessment – Pre and Post test
  - Preparing lesson plans for the subjects
<table>
<thead>
<tr>
<th><strong>Recommended/Reference Books</strong></th>
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<tbody>
<tr>
<td>S.No</td>
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</table>
| 1.   | History of Technical and Vocational Education in India  
      Developments  
      National Policy on Education | 12 Hrs |
| 2.   | Educational Organisation  
      Educational System  
      Technical and Vocational Sub-systems  
      Apprenticeship Board, Functions and its act  
      Articulation of Technical Teacher Training and Vocational Education  
      Aims and Objectives of Different level of Technical Education | 15 Hrs |
| 3.   | Policy, Planning and Administration  
      Structural set up for policy making  
      National, Regional, State Statutory and Advisory Bodies  
      Policy Making Process  
      Planning  
      **Administration, Control and Direction** | 15 Hrs |
| 4.   | Technical Education  
      Growth and Development of Technical Education – Ancient India, Medieval India, Pre-independent India and Post-independent India.  
      Vocational Education in India  
      Status of Vocational Education | 16 Hrs |
| 5.   | Major Issues and Challenges in Technical Education | 8 Hrs |
| 6.   | World Bank Assisted Project for Technician Education and Technical Education Quality Improvement Programme. | 10 Hrs |
| 7.   | Emerging Trends in Technical Education System – Curriculum, Management, Instructional Methods, Evaluation, Resources. | 14 Hrs |
**Practice Tasks**

Historical development of Technical Education in India  
Organizational structure of technical and vocational articulation between different sub systems

A study on  
- **Shortcoming of existing technical education system**  
- Future expectations from technical education in view of changed socio-economic scenario;

**Recommended/Reference Books**

1. Chandrakant LS: Polytechnic Education in India, Bombay, DB Tara Porevola Sons and Company (c.,1971),  
5. UNESCO, Studies in Technical and Vocational Education, United Kingdom, Germany, USA and Japan.  
<table>
<thead>
<tr>
<th>S.No</th>
<th>2009-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Instructional Media - Concept, Types (Dales’ Cone of Experience, Print &amp; Non-print, Projected &amp; Non-projected), Selection and uses; Preliminary planning and designing of media</td>
</tr>
</tbody>
</table>
| 2.(a) | Design and Development of Print Material:  
• Text book  
• Laboratory/Workshop Manuals  
• Instructional Sheets  
• Teacher/student Handbook  
• Self learning Modules  
• Information Brochure | 20 HRS |
| (b)   | Design and Development of Non-Print Material:  
• Charts/graphs, photographs and Models  
• Slides/Film-strips  
• Overhead Transparencies  
• Video Films  
• Power-point presentations  
• Multimedia packages  
• Computer Assisted Instruction | 20 HRS |
| ©     | Evaluation of Media (both Print and Non-Print Material as above in 2(a) and 2(b) : Criteria and Preparation of Checklists/Rating Scales | 10 HRS |
| 3.    | Operation and Maintenance of:  
• Overhead Projector  
• Slide/Film-strip Projector  
• LCD Projector  
• Digital Cameras  
• Scanners  
• Photocopiers | 10 HRS |
| 4.    | Project Work: Design and Development of:  
A Multimedia package (CAI) for two topics  
OR  
Video Film on topic  
OR  
Self learning modules for three topics |
<table>
<thead>
<tr>
<th><strong>Practice Task</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Design and preparation of different media instructional for a given learning situation</td>
</tr>
<tr>
<td>• Practice in script writing and production of video film</td>
</tr>
<tr>
<td>• Practice on the use of hardware</td>
</tr>
<tr>
<td>• Practice exercise on photography</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Recommended/Referenced Books</strong></th>
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</table>
MTE 6107: CAREER GUIDANCE

<table>
<thead>
<tr>
<th>S.No</th>
<th>2007</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Career Development – Concept, Stages in Career Development and Theories of Career Development</td>
</tr>
<tr>
<td>2</td>
<td>Career Guidance – Concept, Purposes and Need for Career Guidance</td>
</tr>
<tr>
<td>3</td>
<td>Self Awareness – Concept, Sources of Collecting Information and Purposes of Self Awareness</td>
</tr>
<tr>
<td>4</td>
<td>Career Information – Educational and Vocational – Need Sources of Information, Techniques of Collecting and Disseminating Information</td>
</tr>
<tr>
<td>5</td>
<td>Counselling – Concept, Purposes, Steps in Conducting Counselling Interviews, Skills in Counselling</td>
</tr>
<tr>
<td>6</td>
<td>Providing Job Placement Services – Student Development Activities, Job Development Activities and Maintenance Activities.</td>
</tr>
<tr>
<td>7</td>
<td>Developing Job Seeking Skills – Writing Cover Letters and Resume, Appearing in Job Interviews, Participating/Leading Group Discussions</td>
</tr>
<tr>
<td>8</td>
<td>Development of Generic Skills among Students – Communication, Creativity, Team Building, Decision Making, Time Management</td>
</tr>
<tr>
<td>9</td>
<td>Evaluation of Career Guidance Programme.</td>
</tr>
</tbody>
</table>

Practice Task:
- Identifying needs for Career Guidance in Technical Institutes.
- Designing Career Guidance Programme for Technical Institutes
- Practice in Conducting Counselling Interviews
- Practice in administration, scoring and interpretation of psychological tests – intelligence, interest, aptitude, self-concept etc

Recommended/Reference Books
<p>| | |</p>
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<tr>
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</thead>
<tbody>
<tr>
<td>3.</td>
<td>Roggers, Carl R, Client Centered Therapy, UK : Amazon Book Co.,</td>
</tr>
<tr>
<td>S.No</td>
<td>2006-07</td>
</tr>
<tr>
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</tbody>
</table>
| 1.   | **Introduction to Human Resource Development**  
Evolution: Pre-industrial, Industrial and Information age  
Mission and Purpose  
Components of HRD  
HRD problems and issues related to Indian Industry and technical education  
HRD in the context of new industrial policy. | 10½ Hrs |
| 2.   | **Stages of HRD**  
Initial or Induction Training  
Training for job-related/professional development  
Training for horizontal and vertical mobility of employees | 10½ Hrs |
| 3.   | **Training & Training Strategies**  
Training: Concept, Assumptions – prevailing and alternative, Phases in training, Modalities of training, drawbacks in existing systems of training, benefits of training, Six goals content and process orientation. | 18 Hrs |
| 4.   | **Training Methods**  
Off-the-Job Training Methods – Lecture, seminar, brain storming, case study, role play, projects, group discussions  
On-the-Job Training Methods – Coaching, counseling, mentoring, reflective practices, subject groups, observing classes of seniors/experts etc.  
Characteristics, merits and demerits of training methods | 16½ Hrs |
| 5.   | **Developing Group and Climate**  
Social process: Three facets, Indicators of group development, the training climate: personal and interpersonal dimensions | 7½ Hrs |
| 6.   | **Evaluation of Training**  
Concept, Purposes, types and issues in evaluation; Steps in designing evaluation of training | 10½ Hrs |
| 7.   | **Systematic Approach to Design of Training Programme:**  
Concept of system, benefits of systematic approach to design of training programme, steps in systematic approach – need analysis, task analysis, entry behaviour analysis, resource and constraints analysis, analysis of goals and objectives, Synthesis of criterion tests, synthesis of contents, synthesis of training methods and media, implementation of training, assessment of trainees’ performance, evaluation of training, improvement in training. | 16½ Hrs |
Practice Tasks

- Design tools for need assessment for HRD in polytechnic education/industry
- Identify training needs of working professionals in polytechnic education/industry
- Design appropriate HRD programmes for needs already identified.
- Design tool for evaluating HRD programmes.
- Case Studies of HRD

REFERENCE/RECOMMENDED BOOKS

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<th>S.No</th>
<th>Date</th>
<th>Title</th>
<th>Notes</th>
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<tbody>
<tr>
<td>1.</td>
<td>2006-07</td>
<td><strong>Introduction to Educational Research</strong></td>
<td>Concept, types – basic, applied and action, Need for educational research</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td><strong>Reviewing Literature</strong></td>
<td>Need, Sources – Primary and Secondary, Purposes of Review, Scope of Review, steps in conducting review.</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td><strong>Identifying and defining research problem</strong></td>
<td>Locating, analysing stating and evaluating problem. Generating different types of hypotheses and evaluating them.</td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td><strong>Methods of Research</strong></td>
<td>Descriptive research design - survey, case study, content analysis, Ex-post Facto Research, Correlational and Experimental Research</td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td><strong>Sampling Techniques</strong></td>
<td>Concept of population and sample’ sampling techniques - simple random sampling, stratified random sampling, systematic sampling and cluster sampling, snow ball sampling, purposive sampling, quota sampling techniques. determining size of sample.</td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td><strong>Design and development of measuring instruments</strong></td>
<td>Tests, questionnaires, checklists, observation schedules, evaluating research instruments, selecting a standardized test.</td>
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<tr>
<td>7.</td>
<td></td>
<td><strong>Procedure of data collection</strong></td>
<td>Aspects of data collection, coding data for analysis</td>
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<tr>
<td>8.</td>
<td></td>
<td><strong>Statistical Methods of Analysis</strong></td>
<td>Descriptive statistics: Meaning, graphical representations, mean, range and standard deviation, characteristics and uses of normal curve. Inferential statistics: t-test, Chi-square tests, correlation (rank difference and product moment), ANOVA (one way) Selecting appropriate methods.</td>
</tr>
<tr>
<td>9.</td>
<td></td>
<td><strong>Procedure for writing a research proposal</strong></td>
<td>Purpose, types and components of research proposal.</td>
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</table>
| 10 | **Procedure for writing a research report**  
Audiences and types of research reports, Format of research report and journal articles. | 4 Hrs |
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<tr>
<td>11</td>
<td><strong>Strategies for evaluating, Research</strong> disseminating and utilising research – An Overview</td>
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</table>

**Practice Tasks**
- Define a research problem in polytechnic education/industry after studying problem situation and literature
- Given the purpose, objectives of research, write hypotheses
- Select research designs for the given research objectives
- Identify the measuring instruments for the given research objectives/hypotheses
- Identify the appropriate statistical methods of analysis for the given research proposal.
- Critically analyse the given research reports on various aspects such as hypothesis, design, measuring tools, statistical analysis, interpretation etc. to identify the gaps or weaknesses in the study.

**REFERENCE/RECOMMENDED BOOKS**
5. CPSC: Developing Skills in Technician Education Research Modules 1 to 11 Singapore, Colombo Plan Staff College for Technician Education
# MTE 6203  Curriculum Development

<table>
<thead>
<tr>
<th>S.No</th>
<th>2006-07</th>
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<tbody>
<tr>
<td>1.</td>
<td>Technical Education in India</td>
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<tr>
<td></td>
<td>- Introduction</td>
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<td></td>
<td>- Organizational Structure at National and State Level</td>
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<td>- Examination and Certification Systems, Accreditation</td>
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<td><strong>6 Hrs</strong></td>
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<td>2.</td>
<td>Technical Education in Response to Future Manpower Requirements</td>
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<tr>
<td></td>
<td>- Introduction</td>
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<tr>
<td></td>
<td>- Pattern of Technical Manpower</td>
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<td></td>
<td>- Education and Training Needs for Organised and Un-organised Sectors</td>
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<td></td>
<td>- Planning Considerations</td>
</tr>
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<td></td>
<td>- Educational Implications</td>
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<td><strong>4 Hrs.</strong></td>
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<td>3.</td>
<td>Curriculum Development – An Overview</td>
</tr>
<tr>
<td></td>
<td>- Concept of curriculum and syllabus</td>
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<tr>
<td></td>
<td>- Curriculum rationale by Ralph Tyler (1950) and Hilda Taba (1962)</td>
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<tr>
<td></td>
<td>- Stages of curriculum development process</td>
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<tr>
<td></td>
<td>- Models of curriculum development based on various approaches – Subject specialization, individual needs and social demand, their comparative strengths and weaknesses</td>
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<td></td>
<td>- Schematic representation of various models</td>
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<tr>
<td></td>
<td>- Stakeholders of curriculum development, their perceptions and role</td>
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<tr>
<td></td>
<td><strong>12 Hrs</strong></td>
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<tr>
<td>4.</td>
<td>Need Analysis or Planning Stage</td>
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<tr>
<td></td>
<td>- Introduction</td>
</tr>
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<td></td>
<td>- Factors influencing curriculum decisions</td>
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<td></td>
<td>- Need analysis surveys</td>
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<td></td>
<td>- Areas of employment</td>
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<td></td>
<td>- Assessing current and future manpower needs and its forecast</td>
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<td></td>
<td>- Tools for conducting need analysis surveys – questionnaires, interviews, observation etc.</td>
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<td></td>
<td><strong>12 Hrs.</strong></td>
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</tbody>
</table>
5. **Curriculum Design**  
- Concept of curriculum design and fundamental components of design  
- Identification of objectives of curriculum  
- Data sources for curriculum design-based on students, subjects and society  
- Characteristics of an ideal curriculum for technical education programme  
- Various approaches in curriculum design – scientific, DACUM, Delphi, skill based, competency based, problem based, value based, thinking curriculum etc.  
- Norms and standards for space, infrastructure, equipment, libraries, computer centre, teaching staff, etc.  
- Various modes of curriculum offering e.g. fixed and linear, flexible, sandwich etc.  

6. **Curriculum Implementation**  
- Factors influencing effective curriculum implementation  
- Monitoring of curriculum implementation  
- Curriculum implementation and Teaching-Learning (TL) process  
- Different contexts of curriculum implementation viz. class room, laboratory, library and field experiences and objectives of every context within overall curriculum objectives  
- Role of academic planning for effective implementation  
- Instructional strategies, relative merits and demerits  
- Student evaluation – formative and summative  
- Mode of delivery: formal, non-formal, distance, e-learning, Technology enhanced learning etc.  

7. **Curriculum Evaluation**  
- Concept of curriculum evaluation – definition and purpose  
- Curriculum evaluation – approaches and models  
- Decision facilitation model – CIPP Model of curriculum evaluation, historical perspective, block diagram, purpose, aspects to be evaluated and respondents  
- Planning and execution of curriculum evaluation including time frame  

8. **Aspects of Quality Improvement in Technical Education**  
- Networking with industry and among the institutions  
- Training and re-training of faculty and staff  
- Development of IT enabled Teaching-Learning  
- Establishing State Implementation Monitoring Cell under the State Boards of Technical Education  
- Training and placement cell, career guidance counseling, R&D cell,
consultancy, community services etc.
- Autonomy – its strategic advantages and disadvantages
- Current live issues - stress management, time management, value education, work culture etc.

**12 Hrs.**

**Practice Tasks**
- Analysis of manpower assessment studies made by NTMIS to identify suitable programmes of study for technician engineers
- Job analysis and activity analysis of specific categories of technician engineers working in the industry
- Curriculum design of a Technical Education
- Technician engineer programme with details of curriculum structure, course content, learning experience and resource requirement
- Strategic planning and organization of resources for effective implementation of a curriculum of a technician engineer programme
- Evaluation of a technician programme with due focus on its internal and external validity
- A study of the norms and standards for physical facilities for the effective implementation of a technician education programme

**Recommended/Reference Books**
1. Alberty, HB and Alberty, EJ, Reorganizing the High School Curriculum, New Delhi Light and Life Publishers
2. CPSC, Manila: Aspects of Curriculum Design
4. Finch Curtis, R. and Grunkilton John,R.,(1989); Curriculum Development in Vocational and Technical Education-Planning, Content and Implementation; Allyn and Bacon, Inc; Boston, USA
8. Taba, Hilda, Curriculum Development – Theory and Practice. Harcourt, Brace and World
<table>
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<tr>
<th>Sr.No.</th>
<th>2006 – 07</th>
</tr>
</thead>
<tbody>
<tr>
<td>•</td>
<td><strong>Introduction to Multimedia</strong> – Concept &amp; Components of multimedia, evolution, current state, and future of multimedia design. <strong>10 Hrs</strong></td>
</tr>
<tr>
<td>•</td>
<td><strong>System Components</strong> – Converging technologies, functions and sub-systems. <strong>10 Hrs</strong></td>
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<tr>
<td>•</td>
<td><strong>Multimedia Platform</strong> – PCs, multimedia hardware, systems software, future directions. <strong>10 Hrs</strong></td>
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<td>•</td>
<td><strong>Developmental tools</strong> – Developing applications, commercial tools, standards <strong>10 Hrs</strong></td>
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<tr>
<td>•</td>
<td><strong>Images</strong> – Image capture and compression. <strong>10 Hrs</strong></td>
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<td>•</td>
<td><strong>Audio</strong> – Audio capture and compression <strong>10 Hrs</strong></td>
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<tr>
<td>•</td>
<td><strong>Video</strong> – Video capture and compression <strong>10 Hrs</strong></td>
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<td>•</td>
<td><strong>Storage for media</strong> <strong>10 Hrs</strong></td>
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<tr>
<td>•</td>
<td><strong>Evaluation of multimedia packages</strong> <strong>10 Hrs</strong></td>
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</tbody>
</table>

**Practice Task**

- Practice in Adobe Photoshop, Flash-Basic, web site design, animation, digital video editing, motion graphics and digital effects

**Project Work**

Development of multimedia package for a selected unit from the subject of teaching.

**References/Books recommended**


<table>
<thead>
<tr>
<th>S.No</th>
<th>Contents</th>
</tr>
</thead>
</table>
| 1    | **Introduction to Web based Training and Web Essentials:**  
*• Origins*  
*• Internet Addresses*  
*• Domain Names*  
*• Web Browser*  
*• Web Server*  
*• URL MIME, HTTP Protocol*  
*• Overview of Client-sick, Server side and scripting language*  
*• Search Engines*  
*• Advantages and Disadvantages of WBT**  
| 12 Hrs |}

<table>
<thead>
<tr>
<th>2.</th>
<th><strong>Approach to Web Based Training and Building E-Content</strong></th>
</tr>
</thead>
</table>
|    | • Markup Language  
|    |   - Basic Syntax  
|    |   - Image Formats  
|    |   - Hypertext links  
|    |   - Lists, tables  
|    |   - Form  
|    |   - Frames  
|    | • Cascading style sheets  
|    | • Data base Access through Web  
|    | • Alternatives to WBT  
|    | • Technology Standards  
|    | • Metaphor |

| 3. | **Course Frame Work** — Information to learners, registration of learners, run the course (Welcome Page, Biographies of Learners, Roster Page, Course Home Page, Learner Home Page, Syllabus Page and Teachers’ Guide), Needed Resources (course resource page, search the net page, text book description, class project), gather feedback, add access mechanism  
|    | 12 Hrs |

| 4. | **Organize Learning Sequence** — Lesson Structure (classical tutorial, activity centered, learner customized, knowledge paced, exploratory, generalized lesson), Creating Building Blocks for lessons and Designing Learning Sequence  
|    | 12 Hrs |

| 5 | **Activate Learning** — Learning activity (Web cast, presentation sequence, drill and practice, scavenger hunt, guided research, guided analysis, team design, brainstorming, case study, role playing scenario, virtual laboratory, group critique), converting classroom activities into web based activity  
|    | 12 Hrs |
6. **Simulation**: Classification, Terminology, Physical and Interactive Simulation, Computer Simulation, Digital Life Cycle Simulation, Simulation and Games Role Play Simulation for Teaching and Learning  

10 Hrs

7. **Web Based Test and Exercise Learning**  
   - Planning  
   - Grading  
   - Feedback  
   - Evaluation  
   - Selecting Type of question and sequencing  
     - True/False  
     - Multiple choice  
     - Text input  
     - Matching – List  
     - Click-in-picture  
     - Drag-and-Drop  
     - Simulation  
     - Fill-in-the blanks  
   - Monitor Results and Improve Testing.  

10 Hrs

7. **Planning and Promote Collaboration**  
   - Collaboration Mechanisms and Issues  
     (E.mail, Discussion Groups, Chat, White Board, Screen Sharing, Response Pads, Audio Conferencing, Video Conferencing)  
   - Moderate Discussion Groups  

10 Hrs

8. **Virtual Classrooms- and Digital Library**  
   - Concepts and Consideration for virtual classroom  
   - Conduct live events  
   - Digital libraries and E-Repository  
   - File formats  
   - OCR  
   - Convert Print to Digital Content  
   - Metal data creation  
   - Collection Building with GLI (GSDL)  

10 Hrs
### Practical
1. Build online Web based Tutorials
2. Build online Exam
3. Build digital library using GSDL or D space
4. Convert Print Material to Digital Material
5. Develop online Discussion for using CMS
6. Develop Web casts
   a. Adobe Suite CS3 or latest
   b. Demo-Guilder Professional 6.0 or above
   c. Quick-builder Professional 6.0 or above
7. Develop on-line form for the registration of learners

### References
2) Khan, Badrul Web Based Training. Educational technology Publication, 2000
3) Kevin K Fiedler Web Based training. Southwest Research Institute, 1999
### S.No Contents                                                                                                 2009-10

1. **Introduction**
   - Education Project: Need, Concept and Characteristic,
   - Rules for Managing Projects 12 Hrs

2. **Project Initiation Phase**
   - Identification of project,
   - Specifying goals and objectives of a project,
   - Identifying risks and constraints,
   - Building project team 16 Hrs

3. **Project Planning Phase**
   - Breakdown of Tasks (checkpoints, activities, relationship, time estimates);
   - Project Scheduling: Bar Charts, PERT/CPM,
   - Resource Planning; Budget (Recurring and Non-recurring);
   - Project Proposal 23 Hrs.

4. **Project Implementation Phase**
   - Directing People individually and as a team;
   - Reinforcing commitment and excitement of the project team
   - Keeping everyone connected with the project
   - Build agreement
   - Empower yourself and others and
   - Encourage risk taking and creativity 24 Hrs

5. **Monitoring and Evaluation**
   - Monitoring – Concept, types and Controls,
   - Characteristics
   - Evaluation – Formative and summative
   - Evaluation of projects 15 Hrs

### Practice Task
1. Identification of a project in an education setting and preparing a project proposal
2. Preparation of bar charts, PERT/CPM Network for given education project
3. Evolving criteria for evaluation of education project

### Reference
### MTE 6207  Entrepreneurship Development

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>2006-2007</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Nature and Scope of Entrepreneurship</strong> - Need and Philosophy of entrepreneurship Characteristics of an entrepreneur; Entrepreneur vs. Self-employment; Intrapreneuring; Role of entrepreneurship in Indian economy, Entrepreneurship and innovation; Indian values and entrepreneurship</td>
</tr>
<tr>
<td>2.</td>
<td><strong>Entrepreneurial Support System</strong> - Three Tiers of Entrepreneurial Support System; Assistance from National level Organisations like SIDO, NSIC, SIDBI, IFCI, IDBI, ICICI, NRDC etc. Assistance from State level organizations like DOI, DIC, SSIE, SISI, SFCs, Commercial Banks etc; Special schemes for technical entrepreneurs and women. Incubation Centres, Awareness camps</td>
</tr>
<tr>
<td>3.</td>
<td><strong>Product Identification</strong> – Identification of Opportunities, Consideration for product selection; Exposure to demand based, resource based, service based, import substitute, export promotion, trading and consultancy ventures.</td>
</tr>
<tr>
<td>4.</td>
<td><strong>Entrepreneurial Motivation Training</strong> - Programme clarity – sharing expectations and unfreezing and refreezing; Data collection about self <strong><code>Who am I</code></strong> write up. Introduction to need system and motivational pattern of entrepreneur (conceptualizing entrepreneurial skills and behaviour). Risk taking behaviour, hope of success, fear of failure, learning from feedback (Ring Toss Game). Through entrepreneurial camps &amp; Incubation centres</td>
</tr>
</tbody>
</table>

Analyzing motive strengths, locating achievements imageries, intensity of motive (Analyzing TAT stories, group and individual level). Personal efficacy, defining, individual life goal, its linkages to entrepreneurship, locus and control, conceptualizing entrepreneurial values.

Planning and goal setting, help and resource use, creativity and divergent thinking, confidence building learning from feedback (Business Games and Exercises).

Achievement Planning (APO) Games
Tolerance to ambiguities and Commitment to entrepreneurial goal (Interaction with successful entrepreneurs). Leadership and Influencing abilities, guidance and help (Block Building Exercises, role playing exercises). Entrepreneurial goal setting, sharing entrepreneurial goal, devising clarity in terms of enterprise building. 15Hrs
<table>
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<tbody>
<tr>
<td>7. Planning of Small and Medium Enterprises</td>
<td>15 Hrs</td>
</tr>
<tr>
<td>Production Management – Production Planning and Scheduling; Materials Management; Inventory management; Technology selection, transfer and management. Accounting and Financial Management – Working capital management; Principles of Book keeping Books of accounts, Financial statements, Funds flow analysis, sources and uses of funds. Marketing Perspectives – Relevance of Marketing for entrepreneurship; Product planning; Pricing decision; Place policies; Advertising and sales policies; Market survey and Demand estimation for selected projects. Personnel Management and Industrial Relations – Procurement, Development, Compensation, Integration, Maintenance functions; Leadership, Communication and Motivation skills.</td>
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<tr>
<td>Practice Task:</td>
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<tr>
<td>- Visit to small and medium enterprises and interacting with entrepreneurs.</td>
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<tr>
<td>- Visit to support agencies and gathering relevant entrepreneurial information.</td>
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<td>- Gathering information about viable projects identified by support agencies.</td>
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<td>- Preparation of preliminary project report.</td>
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<td>- Preparation of detailed project report.</td>
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<td>- Calculation of important financial ratios so as to ascertain techno-economic feasibility of the proposed venture.</td>
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<tr>
<td>- To prepare and deliver class seminars on industrial and commercial legislation.</td>
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<td>Recommended/Reference Books</td>
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<tr>
<td>1. Gupta, CB and Srinivasan, NP; Entrepreneurial Development, New Delhi, Sultan Chand &amp; Sons.</td>
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<td>7. Rathore BS; and Saini; ‘Entrepreneurship Development’, M/S S Chand &amp; Company, Nai Saria, Delhi</td>
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<tr>
<td>13. Sharma DD and others: Training Modules on Entrepreneurship Development</td>
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1. Concept of Educational Technology, approaches and process of Education Technology. 10Hrs

2. Teaching/instruction – Phases/operation of teaching; Learning – concept, types of learning/conditions and principles of teaching – learning. 10Hrs

   Models of teaching: concept and fundamental elements; Basic teaching model, Bruner, Taba and Ausubel’s models of teaching. 10Hrs

3. Developing Instructional packages: task analysis – concept and procedure; instructional objectives; concept, need, Bloom’s Taxonomy, Mager and Gronlund approach for writing objectives; developing different types of packages – audio packages (radio, tape recorded instruction), video packages (TV, films and video – recorded instruction) and multi – media packages (informational technology packages including CAI, media convergent packages); utilizing and anchoring different media. 24Hrs

4. Instructional Methods – lecture, demonstration, project, seminar, tutorials, group discussion; concept mapping, self instructional modules. 10Hrs

5. Improving teaching – Micro-teaching, simulation and analyzing teacher behaviour by Flander’s ten category system. 8Hrs

6. Assessment of student performance – concept, types and process of evaluation. 10Hrs

7. Action Research in teaching. 8Hrs

PRACTICE TASK
Writing Instructional Objectives, Developing Instructional Packages.

SUGGESTED BOOKS
Sodhi, GS and Dutt, Sunil (1995), Teaching Learning – A Process Approach Chandigarh, Publishers
### 1. Introduction:
- Concept of Organisational Behaviour, Need and purpose.
- Variables of human resource effectiveness in organizations:
  - **Dependent Variables** (Productivity, Absenteeism, Turnover and job satisfaction, deviant workplace behaviour)
  - **Independent Variables**: (Individual level variables- Ability-Intellectual & Physical Abilities; Values (Importance and types of values); Job Attitudes; Personality- Determinants, traits & personality attributes; Emotions influencing Organizational Behaviour; Perception-concept, factors influencing perception and the link between perception and individual decision making; Learning- definition and theories of learning; Motivation).
- **Group Level Variables** (Defining and classifying groups, stages of group development, group properties- roles, norms, status, size and cohesiveness, inter group relations-co-operations, competition and conflict, group decision making-group v/s individual, group decision making techniques).

### 2. Organisational Structure
- Definition, elements of structure, functions, kinds of structure, common organization design-simple, the bureaucracy, the matrix structure, team structure, the virtual organizations.

### 3. Organisational Processes
1. Power and authority (Definition and types of power, definition and type of authority, specific differences between power and authority)
2. Leadership
- Concept, theories and styles leaderships, inspirational approaches to leadership and their implications for managing organizations
- Decision making
- Process, models of decision making
- Communication (Meaning, functions, process, directions, interpersonal communication, barriers to effective communication).
4. Organisational Development

Meaning and definition, need and nature
Process of organizational development, intervention/alternative approaches to organization development
Organisational effectiveness
Organisational culture and environment

5. Management of Change

Need for change, forces for change, phases of planned change
Managing planned change- overcoming resistance to change;
approaches to managing change – Lewin’s Classical Model of change process, Kotter’s eight step plan, Action research and OD, Quality circles

Practice Tasks:

1. Determining appropriate leadership styles to suit a given situation pertaining to readiness level of subordinates
2. Identifying strategies for motivating staff in technical education/industry
3. To evolve from a given case the process involved in decision making
4. Identifying areas of high conflict in student’s own setting and suggesting appropriate strategies for managing such conflicts
5. Determine strategies for improving organizational effectiveness in the technical education system/industry
6. Practice in the functioning of quality circles on the improvement of activities in an institute.

Reference Books:

5. LM Prasad:Organisational Behaviour, Sultan Chand & Sons,2007
# MTE 7103: Technology Management

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<tr>
<th>Sr.No.</th>
<th>2006-07</th>
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<tbody>
<tr>
<td>1.</td>
<td>Introduction to Technology Management</td>
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<td>2.</td>
<td>Business Strategy for new Technologies: adding value, gaining competitive advantage, timing and capability development.</td>
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<td>3.</td>
<td>Technology Forecasting: Techniques of Forecasting, Technology Forecasting- Relevance, Strategic alliance and Practicality, and Technology transfer.</td>
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<td>4.</td>
<td>Management of Research, Development and Innovation: Technology Mapping, Comparison of type of R&amp;D projects and development approaches-radical platform and Incremental Projects, innovation process.</td>
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<td>5.</td>
<td>Management of Intellectual Property Rights - Strategic value of patents, trade secrets and licensing.</td>
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<td>6.</td>
<td>Managing scientist and Technologists: Identification, Recruitment, Retention, Team work and Result Orientation.</td>
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<td>Investment in Technology</td>
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<td>7.</td>
<td>Management Roles and Skills for New Technology</td>
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<td>8.</td>
<td>Technology for Managerial Productivity and Effectiveness, Just-in-time.</td>
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<td>9.</td>
<td>Venture Capital &amp; Technology Development</td>
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**Practice Tasks**

- Technology forecasting and Technology mapping
- Technology Strategy Development
- Exercise on Just-in-time
- Cases on Venture Capital
**Reference Books**

2. Innovation and Entrepreneurship in Organizations: By Richard M. Burton & Borge Obel Elsevier
6. Management of Technology
8. Management of Technology and Innovation
10. Managing Engineering and Technology
13. New Product Management: by C marle Crawford IRWIN, USA
17. The Management of Technology and Innovation: A Strategic Approach
INSTRUCTIONS FOR PAPER SETTERS

M.Tech. Engineering Education

- Instructions to students for attempting the Question Paper should be explicitly written.

- Set eight questions covering the whole syllabus for the course.

- External choice is to be given to the students.

- Students are required to attempt any five out of the eight given questions.

- Question Paper should be strictly set from the syllabus prescribed for the courses.

- Content should be adequately represented in the question paper.

- Weightage should be assigned to various topics keeping in view the hours of teaching specified against each topic in the syllabus.

- Ensure inclusion of questions testing the higher level abilities of the students such as applying, analyzing, evaluating and creating rather than simply testing rote memorization of the content.

- Restricted essay type questions should be preferred over essay type questions.

- Numerical questions should be carefully written so as to include all the necessary data and information. Any data tables required for interpretation of results should be clearly specified.

- Any support material (codes, tables, calculators etc.) to be provided to students should be clearly specified.

- The figures/diagrams should be drawn neat and clean and should be dimensioned and labeled properly.

- Marks allocated to each question/parts should be clearly indicated against the questions/parts.

- Confidentiality must be strictly maintained.

- Time provided to you for setting the question paper should be strictly adhered to.