

CTM Syllabus

25/6

File No \_\_\_\_\_



Name CTM - 401

Subject CTM - 402

Section CTM - 403

CTM - 404

CTM - 405

CTM - 405

**RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA**

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THREE YEARS DIPLOMA PROGRAMME IN  
CONSTRUCTION TECHNOLOGY AND MANAGEMENT

UNDER  
MULTIPOINT ENTRY AND CREDIT SYSTEM

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DETAILED SYLLABUS

BASIC TECHNOLOGY COURSES FOR CONSTRUCTION TECHNOLOGY  
AND MANAGEMENT.

1. CTM 401 SURVEYING- I
2. CTM 402 SURVEYING- II
3. CTM 403 ENTREPRENEURSHIP
4. CTM 404 MECHANICS OF STRUCTURE
5. CTM 405 CIVIL ENGINEERING DRAWING
6. CTM 406 MATERIAL TECHNOLOGY

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SPONSORED BY-

DIRECTOR OF TECHNICAL EDUCATION BHOPAL (M.P.)

DEVELOPED BY --

CURRICULUM DEVELOPMENT CENTRE

M.P. BOARD OF TECHNICAL EDUCATION, BHOPAL

IN COLLABORATION WITH

TECHNICAL TEACHERS TRAINING INSTITUTE (W.R.) BHOPAL

P R E F A C E.

In Madhya Pradesh most of the Polytechnics offer straight joacketed Diploma programmes in Civil, Mechanical, Electrical and Electronics & Tele-Communication Engineering. Curriculum is the most crucial input in a technical education, hence, initiating to develop a need based curriculae for establishing relevance of Polytechnic output to the needs of industry, is the demand of the time.

At present 10+ and 12+ science stream/technical stream students in different proportions join a three year diploma programme in all Polytechnics. 10+ students are admitted to first year and 12+ students in Second year of three year diploma programme. These students do not have any option in selection of courses (subjects) and have no opportunity for taking alternative courses appropriate to their capability.

The National policy on Education, therefore, rightly recognised the need for a flexible structure which would allow students to enter the system at different points depending on their entry levels, and take up combination of courses according to needs, thereby facilitating the production of man power for a spectrum of technologies and occupations enhancing the efficiency of the system.

It is, in this context, that the Directorate of Technical Education, Madhya Pradesh and M.P. Board of Technical Education explored the feasibility of restructuring polytechnic education in Madhya Pradesh under World Bank Scheme by introducing the Multi Point Entry and Credit System (MPECS). This Scheme of flexible structure has been introduced in S.V. Government Polytechnic, Bhopal from July, 1990.

Considering the nature of the scheme, the courses (subjects) offered in this new scheme have been clustered under the following groups.

- (2) HARD CORE COURSES are the courses which are to be taken both by 10+ and 12+ students.
- (3) In the SOFT CORE COURSES there is a choice for the students to select the courses of their choice.
- (4) BASIC TECHNOLOGY courses are the bridge courses between Science subjects and applied Technology courses.
- (5) APPLIED TECHNOLOGY courses are the terminal courses through which the desired knowledge and skills are developed in the students, to perform his job function in the chosen field of technology.
- (6) DIVERSIFIED courses are included to provide an opportunity for some more detailed knowledge in specific areas in the same or related discipline.

The curriculum development centre of the M.P. Board of Technical Education therefore undertook the task of preparing the syllabus/curriculum of the various courses of Diploma programme in Mechanical, Electrical and Construction Technology and Management started under Multi Point Entry and Credit System in collaboration with the CDC Centre of Technical Teacher's Training Institute, Bhopal. The first workshop for preparing the syllabus of the above three disciplines was conducted at TITI., Bhopal from 26-11-90 to 1-12-90 in which teachers from various Polytechnics and particularly from S.V. Government Polytechnic, Bhopal actively participated. The Board of Studies of the respective disciplines have approved the prepared syllabus, and the syllabus is being printed with the intention that the implementation of MPECS should continue unabated.

Where ever required a component of safety and environment has been included in the syllabus and proper

care has been taken in :-

- (a) Maintaining sequence of topics.
- (b) Allotting HRS for each topics.
- (c) Avoiding overlaps of the content.
- (d) Relevance of the content.
- (e) Prerequisite of the content.

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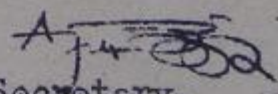
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The comments and healthy criticism from faculty members are however welcome, so that this prepared syllabi can be reviewed and revised periodically.

We are highly grateful to the Director of Technical Education and Prof. C.A. Keshwami, Additional Director of Technical Education, Bhopal for their valuable guidance, encouragement and active co-operation in organising the above workshop.

Words of obligation are due, to Prof. S.A. Balu, Principal, TTTI, Bhopal and the CDC faculty of TTTI, Bhopal. It is out of their valuable suggestions and long term experience in curriculum development that this syllabus is in the hands of the user.

We aspire to improve this in times to come.

  
Secretary, - 22/2/91  
M.P. Board of Technical Education,  
Bhopal.

LIST OF PARTICIPANTS.

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POLYTECHNIC FACULTY.

- (1) Shri B.B. Bhargava. S.V. Government Polytechnic, Bhopal.
- (2) Shri U.K. Shrivastava. S.V. Government Polytechnic, Bhopal.
- (3) Shri T. Chatterjee. Government Polytechnic, Jabalpur.
- (4) Shri B.L. Khare. Government Women's Poly. Sagar.
- (5) Shri B.P. Sinha. S.V. Government Polytechnic, Bhopal.
- (6) Shri S.K. Saxena. S.V. Government Polytechnic, Bhopal.
- (7) Shri R.M. Hastak. Government Polytechnic, Jabalpur.
- (8) Smt. S. Ekbote. S.V. Government Polytechnic, Bhopal.
- (9) Shri R.K. Gawande. S.V. Government Polytechnic, Bhopal.
- (10) Shri R.C. Chouksey. Shri Vaishnav Polytechnic, Indore.
- (11) Shri R.R. Gangane. Government Polytechnic, Ujjain.
- (12) Shri M.G. Rawal. Government Polytechnic, Jabalpur.
- (13) Shri B.K. Saxena. S.V. Government Polytechnic, Bhopal.

T.T.T.I. FACULTY.

- (1) Prof. V.M. Kapse Head of the Department C.D.C.
- (2) Dr. N.S. Kapruan.
- (3) Prof. G.N.N. Rao
- (4) Prof. H.R. Namanna.
- (5) Dr. K.C. Sabbarwal.
- (6) Prof. S.B.L. Shrivastava.
- (7) Prof. P.C. Jain.
- (8) Prof. M.K. Shrivastava.

CURRICULUM DEVELOPMENT CENTRE:

- (1) Shri Ashok Ratnaparkhi. Joint Director
- (2) Shri K.K. Jain. Deputy Director
- (3) Shri C.P. Bhargava. Deputy Director.

MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,

BHOJAL

PROGRAMME; DIPLOMA IN CONSTRUCTION TECHNOLOGY AND MANAGEMENT UNDER M.P.E.C.S.

PROGRAMME - SCHEME.

DISCIPLINE FOUNDATION COURSES.

| S. No.         | CODE No. | COURSE TITLES            | CREDIT |
|----------------|----------|--------------------------|--------|
| 1.             | 101      | Communication Skill- I   | 3      |
| 2.             | 102      | Communication Skill- II. | 3      |
| 3.             | CTM 103  | Physics.                 | 5      |
| 4.             | CTM 104  | Chemistry.               | 5      |
| 5.             | 107      | Mathematics- I.          | 4      |
| 6.             | 108      | Mathematics- II.         | 4      |
| Total credits. |          |                          | 24     |

- Notes 1. To be compulsorily taken by all 10+ students of DCTM programme.
2. Courses 101, 102, 107 and 108 are common to DCTM, DME & DSE Programmes.

DISCIPLINE: HARD CORE

| S.NO.          | CODE NO. | COURSE TITLE                     | CREDIT |
|----------------|----------|----------------------------------|--------|
| 1.             | 201      | Applied Mech.                    | 4      |
| 2.             | CTM 202  | SOil Mechanics.                  | 3      |
| 3.             | CTM 203  | Hydraulics.                      | 3      |
| 4.             | CTM 204  | Elements of Civil Engg. Drawing. | 5      |
| Total Credits. |          |                                  | 15     |

- Note (1) Compulsory for all 10+ and 12+ students of DCTM programme.
- (2) Course 201 common to DCTM, DME & DSE. programmes.

DISCIPLINE : SOFT CORE COURSES

| S.No.          | Code No. | COURSE TITLE.                             | Credit. |
|----------------|----------|---|---------|
| 1.             | 301      | Computer Asp.                             | 3       |
| 2.             | 302      | Environmental Engg.                       | 3       |
| 3.             | CTM 303  | Rural Housing and Sanitation.             | 3       |
| 4.             | CTM.304  | Interior Decoration and furniture Design. | 3       |
| 5.             | CTM.305  | Industrial Engg.                          | 3       |
| 6.             | CTM.306  | Architecture.                             | 3       |
| 7.             | CTM 307  | Element of Mechanical & Elect.Engg.       | 3       |
| 8.             | CTM 308  | Town and County planning.                 | 3       |
| Total Credits. |          |   | 09      |

- Note(1) Any three courses to be offered by each student of DCTM Programme
- (2) Courses 301 & 302, common to DCTM, DME & DSE. Programmes.

DISCIPLINE : BASIC TECHNOLOGY

| S.No.          | Code No. | Course title            | Credit |
|----------------|----------|-------------------------|--------|
| 1.             | CTM 401  | Surveying- I.           | 5      |
| 2.             | CTM 402  | Surveying- II.          | 5      |
| 3.             | CTM 403  | Entrepreneurship.       | 3      |
| 4.             | CTM 404  | Mech. of Structure      | 4      |
| 5.             | CTM 405  | Civil Engineering- Drg. | 5      |
| 6.             | CTM 406  | Material Technology     | 5      |
| Total credits. |          |                         | 27     |

- Note : All courses are to be taken by students of DCTM Programme.

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III. PROGRAMME SCHEME.

PROGRAMME: DIPLOMA IN CONSTRUCTION TECHNOLOGY AND MANAGEMENT.

DISCIPLINE : APPLIED TECHNOLOGY.

DISCIPLINE : DIVERSIFIED.

| S.No.          | Code No. | Course title                          | Credit. |
|----------------|----------|---------------------------------------|---------|
| 1.             | CTM 501  | Construction Tech.I.                  | 6       |
| 2.             | CTM 502  | Construction Tech.II.                 | 6       |
| 3.             | CTM 503  | Construction Tech.III.                | 6       |
| 4.             | CTM 504  | Quality Surveying Costing.- I.        | 5       |
| 5.             | CTM 505  | Quality Surveying Costing- II.        | 4       |
| 6.             | CTM 506  | Construction Management.              | 5       |
| 7.             | CTM 507  | Structural Design & Drawing. I.(RCC)  | 5       |
| 8.             | CTM 508  | Structural Design & Drawing II(Steel) | 4       |
| 9.             | CTM 509  | Industrial Training & Report I.       | 3       |
| 10.            | CTM 510  | Industrial Training & Report II.      | 3       |
| 11.            | CTM 511  | Advanced Entrepreneurship & Project.  | 5       |
| 12.            | CTM 512  | Project.                              | 5       |
| Total Credits. |          |                                       | 57      |

| S.No.          | Code No. | Course Title                             | Credit |
|----------------|----------|--|--------|
| 1.             | CTM 601  | Fabrication & Erection.                  | 4      |
| 2.             | CTM 602  | Materials Management                     | 4      |
| 3.             | CTM 603  | Marketing Management                     | 4      |
| 4.             | CTM 604  | Human Resource Management.               | 4      |
| 5.             | CTM 605  | Prefab. Conc. Construction.              | 4      |
| 6.             | CTM 606  | Advance Environmental Engineering.       | 4      |
| 7.             | CTM 607  | Computer Aided Design.                   | 4      |
| 8.             | CTM 608  | Advanced Structural Design and Drafting. | 4      |
| Total Credits. |          |  | 08     |

Note: S(1) Student will have to clear all the foundation courses before taking up any course of this level of DCTM programme.

(2) All courses are to be taken by students of DCTM programme.

Note : (1) Student will have to clear all the foundation courses before taking up any course of this level of DCTM programme.

(ii) Any two courses to be offered by the student of DCTM programme.

NOTE: To pass the programme, student has to earn 140 credits.



MADHYA PRADESH BOARD OF TECHNICAL EDUCATION, BHOPAL.  
SCHEME OF STUDIES AND EXAMINATION OF DIPLOMA IN CONSTRUCTION TECHNOLOGY AND MANAGEMENT.  
(M.P.E.C.S.)

FOUNDATION COURSE.

| S.No. CODE NO. COURSE       | PRE-REQUISITE           | TH. | HOURS/NEEL. | PR. | CREDITS.      |    | SESSIONAL LAB WORK | PROGRESSIVE ASSESSMENT | BOARD PAPER | EXAM. DUR. | THEORY MARKS. | PRACTICAL/VIVA REMARKS. |
|-----------------------------|-------------------------|-----|-------------|-----|---------------|----|--------------------|------------------------|-------------|------------|---------------|-------------------------|
|                             |                         |     |             |     | I             | II |                    |                        |             |            |               |                         |
| <u>1. FOUNDATION COURSE</u> |                         |     |             |     |               |    |                    |                        |             |            |               |                         |
| 1. 101                      | COMMUNICATION SKILL I   | -   | 3           | -   | -             | 3  | 20                 | 10                     | 10          | 3 Hrs.     | 100           | -                       |
| 2. 102                      | COMMUNICATION SKILL-II. | -   | 3           | -   | -             | 3  | 20                 | 10                     | 10          | 3 Hrs.     | 100           | -                       |
| 3. CEM103                   | PHYSICS.                | -   | 4           | 2   | 2             | 5  | 20                 | 10                     | 10          | 3 Hrs.     | 100           | 3 Hrs. 50               |
| 4. CEM104                   | CHEMISTRY.              | -   | 4           | 2   | 2             | 5  | 20                 | 10                     | 10          | 3 Hrs.     | 100           | 3 Hrs. 50               |
| 5. 107                      | MATHEMATICS-I           | -   | 4           | -   | -             | 4  | 20                 | 10                     | 10          | 3 Hrs.     | 100           | -                       |
| 6. 108                      | MATHEMATICS-II.         | -   | 4           | -   | -             | 4  | 20                 | 10                     | 10          | 3 Hrs.     | 100           | -                       |
|                             |                         |     |             |     | TOTAL CREDITS |    |                    | 24                     |             |            |               |                         |

NOTE:

- (1) Foundation courses are compulsory for all 104 students.
- (2) Course code No. 101, 102, 107, 108 are common to DCIM/DME/DEF.

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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION, BHOPAL,

SCHEME OF STUDIES AND EXAMINATION OF DIPLOMA IN CONSTRUCTION TECHNOLOGY AND MANAGEMENT

2. HARD CORE

| S. No. | CODE NO. | COURSE. | PRE REQUISITE | TH. | HOURS/WEEK | PR. | TERM WORK | LAB ASSESSMENT. | BOARD EXAM. PAPER | EXAM. DUR. | THEORY HOURS. | PRACT. DUR. | VIVA MARKS. | REMARKS. |
|--------|----------|---------|---------------|-----|------------|-----|-----------|-----------------|-------------------|------------|---------------|-------------|-------------|----------|
|        |          |         |               |     |            |     | WORK I    | II.             |                   |            |               |             |             |          |
|        |          |         |               |     |            |     |           |                 |                   |            |               |             |             |          |

2. HARD CORE.

|    |    |         |   |   |   |   |    |    |    |    |   |     |   |        |    |
|----|----|---------|---|---|---|---|----|----|----|----|---|-----|---|--------|----|
| 7  | 1. | 201     | - | 3 | 2 | 4 | 20 | 20 | 10 | 10 | 3 | 100 | 1 | 3 Hrs. | 50 |
|    |    |         |   |   |   |   |    |    |    |    |   |     |   |        |    |
| 8  | 2. | CTM 202 | - | 2 | 2 | 3 | 20 | 20 | 10 | 10 | 3 | 100 | 1 | 3 Hrs. | 50 |
|    |    |         |   |   |   |   |    |    |    |    |   |     |   |        |    |
| 9  | 3. | CTM 203 | - | 2 | 2 | 3 | 20 | 20 | 10 | 10 | 3 | 100 | 1 | 3 Hrs. | 50 |
|    |    |         |   |   |   |   |    |    |    |    |   |     |   |        |    |
| 10 | 4. | CTM 204 | - | 2 | 6 | 5 | 20 | 20 | 10 | 10 | 3 | 100 | 1 | (VIVA) | 50 |

TOTAL CREDITS 15

NOTE :- (1) Hard Core courses are compulsory for all 10+ and 12+ students.

(2) Course Code No. 201 is common to DCTM/DME/DCE.

MADHYA PRADESH BOARD OF TECHNICAL EDUCATION, BHOPAL.

SCHEME OF STUDIES AND EXAMINATION OF DIPLOMA IN CONSTRUCTION TECHNOLOGY AND MANAGEMENT.

(M.P.E.C.S.S.)

3. SOFT CORE.

SOFT CORE.

| No. CODE NO.  | COURSE.                                     | PRE-REQUISITE TH. | HOURS/WEEK | PR. | CREDIT. | SESSIONAL |                  | BOARD EXAM. DUR. | THEORY MARKS. | PRACTICAL/VIVA. | REMA.  |     |   |        |    |
|---------------|---|-------------------|------------|-----|---------|-----------|------------------|------------------|---------------|-----------------|--------|-----|---|--------|----|
|               |   |                   |            |     |         | TERM I    | LAB. ASSESSMENT. |                  |               |                 |        |     |   |        |    |
|               |   |                   |            |     |         | WORK I    | II.              |                  |               |                 |        |     |   |        |    |
|               |   |                   |            |     |         | WORK      |                  |                  |               |                 |        |     |   |        |    |
| 301           | COMPUTER APPLICATION.                       | -                 | 2          | 2   | 3       | 20        | 20               | 10               | 10            | 1               | 3 Hrs. | 100 | 1 | 3 Hrs. | 50 |
| 302           | ENVIRONMENTAL ENGINEERING.                  | -                 | 2          | 2   | 3       | 20        | 20               | 10               | 10            | 1               | 3 Hrs. | 100 | 1 | 3 Hrs. | 50 |
| CTM 303       | RURAL HOUSING AND SANITATION.               | -                 | 3          | -   | 3       | 20        | 20               | 10               | 10            | 1               | 3 Hrs. | 100 | - | -      | -  |
| CTM 304       | INTERIOR DECORATION AND FURNITURE DESIGN.   | -                 | 2          | 2   | 3       | 20        | 20               | 10               | 10            | 1               | 3 Hrs. | 100 | 1 | 3 Hrs. | 50 |
| CTM 305       | INDUSTRIAL ENGINEERING.                     | -                 | 2          | 2   | 3       | 20        | 20               | 10               | 10            | 1               | 3 Hrs. | 100 | 1 | 3 Hrs. | 50 |
| CTM 306       | STRUCTURE                                   | CTM 305           | 2          | 2   | 3       | 20        | 20               | 10               | 10            | 1               | 3 Hrs. | 100 | 1 | 3 Hrs. | 50 |
| CTM 307       | ELEMENTS OF MECHANICAL AND ELECTRICAL ENGG. | -                 | 2          | 2   | 3       | 20        | 20               | 10               | 10            | 1               | 3 Hrs. | 100 | 1 | 3 Hrs. | 50 |
| CTM 308       | TOWN AND COUNTRY PLANNING.                  | CTM 304           | 2          | 2   | 3       | 20        | 20               | 10               | 10            | 1               | 3 Hrs. | 100 | 1 | 3 Hrs. | 50 |
| TOTAL CREDITS |   |                   |            |     |         | 9         |                  |                  |               |                 |        |     |   |        |    |

NOTE :- Any Three courses will be offered by each student.

MADHYA PRADESH BOARD OF TECHNICAL EDUCATION, BHOPAL.  
SCHEME OF STUDIES AND EXAMINATION OF DIPLOMA IN CONSTRUCTION TECHNOLOGY AND MANAGEMENT.  
 (M.P.E.C.S.)

4. BASIC TECHNOLOGY.

| S. No.                     | CODE NO. | COURSE.               | PRE-REQUISITE/QUIZ/WORK/Th. Pr. | CREDIT.       | SESSIONAL       |             | PROGRESSIVE BOARD EXAM. DURS. | THEORY PRACTICAL/VIVA | REMARK. |        |                    |   |        |     |           |
|----------------------------|----------|-----------------------|---------------------------------|---------------|-----------------|-------------|-------------------------------|-----------------------|---------|--------|--------------------|---|--------|-----|-----------|
|                            |          |                       |                                 |               | LAB. ASSESSMENT | PAPER DURS. |                               |                       |         | MARKS. | PRACT. DUR. MARKS. |   |        |     |           |
| <u>4. BASIC TECHNOLOGY</u> |          |                       |                                 |               |                 |             |                               |                       |         |        |                    |   |        |     |           |
| 19.                        | CTM 401  | SURVEYING I           | -                               | 2             | 6               | 5           | 20                            | 20                    | 10      | 10     | 10                 | 3 | 3 Hrs. | 50  |           |
| 20.                        | CTM 402  | SURVEYING-II.         | CTM 401                         | 2             | 6               | 5           | 20                            | 20                    | 10      | 10     | 10                 | 1 | 3 Hrs. | 50  |           |
| 3.                         | CTM 403  | ENTREPRENEURSHIP.     | -                               | 3             | -               | 3           | -                             | -                     | 10      | 10     | 10                 | 1 | 3 Hrs. | 100 | -         |
| 4.                         | CTM 404  | MECH. OF STRUCTURE.   | 201                             | 4             | -               | 4           | -                             | -                     | 10      | 10     | 10                 | 1 | 3 Hrs. | 100 | -         |
| 5.                         | CTM 405  | CIVIL ENGG. DRAWING.  | CTM 204                         | 2             | 6               | 5           | 20                            | 20                    | 10      | 10     | 10                 | 1 | 4 Hrs. | 100 | 50 (VIVA) |
| 6.                         | CTM 406  | MATERIALS TECHNOLOGY. | CTM 204                         | 3             | 4               | 5           | 20                            | 20                    | 10      | 10     | 10                 | 1 | 3 Hrs. | 100 | 50        |
|                            |          |                       |                                 | TOTAL CREDITS |                 |             | 27                            |                       |         |        |                    |   |        |     |           |

NOTE:- All courses are compulsory.

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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION, BHOPAL.

SCHEME OF STUDIES AND EXAMINATION OF DIPLOMA IN CONSTRUCTION TECHNOLOGY AND MANAGEMENT  
(M.P.E.C.S.)

| S.No.                  | CODE NO. | COURSE.                                | PRE-REQUISITE. | HOURS/WEEK |     | CRE-PTS. | DITS. | WORK | LAB. WORK. | ASSESSMENT | PROGRESSIVE BOARD EXAM. | THEORY PRACTICAL/VIVA HRS. |
|------------------------|----------|--|----------------|------------|-----|----------|-------|------|------------|------------|-------------------------|----------------------------|
|                        |          |  |                | Th.        | Pt. |          |       |      |            |            |                         |                            |
| 5. APPLIED TECHNOLOGY. |          |  |                |            |     |          |       |      |            |            |                         |                            |
| 5. APPLIED TECHNOLOGY. |          |  |                |            |     |          |       |      |            |            |                         |                            |
| 5. APPLIED TECHNOLOGY  |          |  |                |            |     |          |       |      |            |            |                         |                            |
| 1.                     | CTM 501  | CONSTRUCTION TECHNOLOGY-I.             |                | 4          | 4   | 6        | 20    | 20   | 10         | 10         | 1                       | 3 Hrs. 1 3 Hrs. 50         |
| 2.                     | CTM 502  | CONSTRUCTION TECHNOLOGY-II.            |                | 4          | 4   | 6        | 20    | 20   | 10         | 10         | 1                       | 3 Hrs. 1 3 Hrs. 50         |
| 3.                     | CTM 503  | CONSTRUCTION TECHNOLOGY-III.           |                | 4          | 4   | 6        | 20    | 20   | 10         | 10         | 1                       | 3 Hrs. 1 3 Hrs. 50         |
| 4.                     | CTM 504  | QUANTITY SURVEY AND COSTING-I.         |                | 2          | 6   | 5        | 20    | -    | 10         | 10         | 1                       | 3 Hrs. 100 - -             |
| 5.                     | CTM 505  | QUANTITY SURVEY AND COSTING-II.        |                | 2          | 4   | 4        | 20    | -    | 10         | 10         | 1                       | 3 Hrs. 100 - -             |
| 6.                     | CTM 506  | CONSTRUCTION MANAGEMENT.               |                | 4          | 2   | 5        | 20    | -    | 10         | 10         | 1                       | 3 Hrs. 100 - -             |
| 7.                     | CTM 507  | STRU. DESIGN AND DRAWING-I (J.C.)      |                | 3          | 3   | 5        | 20    | -    | 10         | 10         | 1                       | 3 Hrs. 100 1 3 Hrs. 50     |
| 8.                     | CTM 508  | STRUCT. DESIGN AND DRAWING-II (STEEL)  |                | 2          | 3   | 4        | 20    | -    | 10         | 10         | 1                       | 3 Hrs. 100 1 3 Hrs. 50     |
| 9.                     | CTM 509  | INDUSTRIAL TRAINING REPORT-I.          |                | -          | 6   | 3        | 20    | -    | 10         | 10         | -                       | 1 - - 50 (VIVA)            |
| 10.                    | CTM 510  | INDUSTRIAL TRAINING REPORT-II          |                | -          | 6   | 3        | 20    | -    | 10         | 10         | -                       | 1 - - 50 (VIVA)            |
| 11.                    | CTM 511  | ADVANCED ENTREPRENEURSHIP AND PROJECT. |                | 2          | 3   | 5        | 20    | 20   | 10         | 10         | 4                       | 3 Hrs. 100 1 - - 50 (VIVA) |
| 12.                    | CTM 512  | PROJECT MIN. CREDIT (CIVIL ENGG.)      |                | -          | 6   | 5        | 20    | -    | -          | -          | -                       | - - - 50 (VIVA)            |

Board not to all



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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOJAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY AND MANAGEMENT.

COURSE : SURVEYING. -I.

COURSE CODE NO : CIM- 401

PREREQUISITE : NIL.

R A T I O N A L E.

This is one of the most important subject of Civil Engineering as all the works related to Engineering first of all need the Survey of that area.

The functions of a Civil Engineering Diploma holder includes the job of doing survey work, plotting of survey datas and preparation of Survey maps and drawings from the Survey of area. This skill should be developed in the students, thoroughly.

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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOPAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY & MANAGEMENT.  
COURSE : SURVEYING- I.  
COURSE CODE NO : CTM 401  
PREREQUISITE : NIL.

SCHEME OF STUDIES.

| <u>S.No.</u> | <u>TOPICS.</u>                   | <u>THEORY</u> | <u>PR.</u> | <u>TOTAL.</u> |
|--------------|----------------------------------|---------------|------------|---------------|
| 1.           | Introduction.                    | 01            | -          | 01            |
| 2.           | Chain Surveying.                 | 08            | 24         | 32            |
| 3.           | Chain and compass<br>Traversing. | 05            | 21         | 26            |
| 4.           | Levelling.                       | 12            | 30         | 42            |
| 5.           | Plane Table Survey.              | 06            | 21         | 27            |
|              |                                  | <hr/>         |            |               |
| Total Hours. |                                  | 32            | 96         | 128           |
|              |                                  | <hr/>         |            |               |
| Credits -    |                                  | 05            |            |               |



25/16

MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHO PAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY & MANAGEMENT.  
COURSE : SURVEYING- I.  
COURSE CODE NO : CTM 401  
PREREQUISITE : -NIL.

C O N T E N T S.

S.No. TOPIC.

1. INTRODUCTION

Definition and purpose of Surveying. . . . .  
Plane and Geodetic survey. Principles of Surveying.  
Various instruments, used for Linear measurements  
and angular measurements.

2. CHAIN SURVEYING

Study of (i) 21 metre (ii) 30 metre chain. Knowledge of  
types of various tapes, use of metallic, steel and invar tapes  
according to precision requirements, use of accessories  
such as ranging rods, arrows pegs.  
Direct and indirect ranging.  
Chain triangulation, factors affecting the location of Survey  
stations, fixing the position of survey stations, Location  
of objects by perpendicular off sets and oblique offsets  
and their suitability. Purpose and use of base line check line  
Tie line and chain angles. Booking field notes and plotting  
the same. Errors in chaining cumulative and compensating errors  
conventional signs to indicate ground features of survey  
such as roads, Railways, transmission lines, use of cross  
staff and optical square. Obstacles in chain surveying,  
various methods to overcome obstructions.

### 3. CHAIN & COMPASS

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#### TRAVERSING.

Closed and open traverse. Description and use of prismatic compass, Bearing of a line, forebearing, back bearing, whole circle bearing, reduced bearing, true bearing, Local attraction and its deflection, Traversing by chain and compass. Closing error, Graphical adjustment of closing error.

#### 4- LEVELLING.

Meaning of various terms used in levelling, such as level line, horizontal plane  
/ horizontal line, vertical line, vertical plane, datum surface, level surface, Bench mark, reduced level, line of collimation, <sup>etc.</sup> Various types of level, Dumpy level, Tilting level, Fundamental lines of level and their relationship. Permanent adjustment of Dumpy level ( only knowledge level). Various types of levelling staves, Methods of levelling, Simple levelling, Differential levelling, fly levelling, longitudinal and cross check levelling  
/ sectioning / Methods of reducing levels and checks, Computation of missing readings.

#### 5. PLANE TABLE SURVEY

Principles of plane table Survey. Plane table and its accessories, setting of plane table on a station, orientation and its importance, Method of plane table survey, suitability of each method, Advantages and disadvantages of plane table survey, Plane table Survey by radiation method and intersection method.

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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHPAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY AND MANAGEMENT.  
COURSE : SURVEYING- I.  
COURSE CODE NO: CTM- 401  
PREREQUISITE : NIL.

LIST OF PRACTICALS.

- (1) Study of chain survey equipments and their uses.
- (2) To fix station points and to measure a length of a line by direct ranging with the help of chain and ranging rod and to draw a perpendicular from a point on chain line.
- (3) To perform a chain survey of a straight line and plot it.
- (4) To perform a chain survey of a closed traverse fixing the angle between two chain lines by tie line and to plot them and adjusting the closing error by graphical method.
- (5) Study the part of prismatic compass and to measure the bearings of lines joining different object. to station point.
- (6) To take the Fore bearings and B.B. of sides of a regular polygon and to calculate included angle and check them.
- (7) Given the sides of a regular pentagon and a F.B. of a line, to fix th points on the field to make a regular pentagon.
- (8) To perform a chain and a compass survey of an area by open traverse. and prepare a map.
- (9) To perform chain and compass survey of a closed traverse plotting the same and adjusting the traverse by a graphical method.
- (10) To study the levelling equipments and to learn temporary adjustment of a levelling instrument ( Dumpy level).

- (11) To find the R.L. of the given points from a single setting of the instrument.
- (12) To find the R.L. of the given points including the points above the line of sight by different setting of the instrument.
- (13) To take the longitudinal and cross section levels of an existing road.
- (14) To study the accessories of plane table survey and to plot the objects by radial method.
- (15) To perform the plot table survey of a small area by inter section method.
- (16) To conduct the plane table survey of an area using both the method.

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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOPAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY & MANAGEMENT.  
COURSE : SURVEYING- I.  
COURSE CODE NO : CTM- 401  
PREREQUISITE : - NIL.

REFERENCE BOOKS.

- (1) Surveying by Hussain.
- (2) Surveying and levelling Vol. I. by B.C. Punamia.
- (3) Plane Surveying- Vol. I. by T.F. Kanetkar.
- (4) Surveying Vol I. by Clarke.
- (5) Practical Surveying by Foote and Davis.

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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOPAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY AND MANAGEMENT.  
COURSE : SURVEYING- II.  
COURSE CODE NO : CTM 402  
PREREQUISITE : CTM 401

R A T I O N A L E .

In this subject more advanced chapters in respect to the topics and contents than Surveying- I, are provided. This will make the diploma student well versed in doing more accurate and detailed survey related to Civil Engineering work e.g. construction of Roads, Bridges, Irrigation works etc. More emphasis is given on the field work rather than class room teaching hence more hours are provided for field work.

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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOPAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY AND MANAGEMENT.

COURSE : SURVEYING- II.

COURSE CODE NO : CIM- 402

PREREQUISITE : CIM 401

SCHEME OF STUDIES

| <u>S. No. of topic.</u> | <u>TOPICS.</u>     | <u>TH. HRS.</u> | <u>PR. HRS.</u> | <u>TOTAL.</u> |
|-------------------------|--------------------|-----------------|-----------------|---------------|
| 1.                      | Revision.          | 6               | 15              | 21            |
| 2.                      | Contouring.        | 8               | 30              | 38            |
| 3.                      | Theodolite.        | 8               | 24              | 32            |
| 4.                      | Minor Instruments. | 2               | 3               | 05            |
| 5.                      | Setting of works.  | 8               | 24              | 32            |
| -----                   |                    |                 |                 |               |
|                         | Total              | 32              | 96              | 128           |

Credits - 5

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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOPAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY & MANAGEMENT.

COURSE : SURVEYING- II.

COURSE CODE NO : CTM 402

PREREQUISITE : CTM- 401

C O N T E N T S.

S.No.      Topic.      C O N T E N T S

1. Revision ; Recapitulase the use of plane table for plotting of details and use of Dumpy level for profile and differential levelling- Toposheets and their uses.
2. Contouring : Definition of contour, contour interval, horizontal equivalent, use of contouring, Reading of a contour plan, characteristics of contours, Direct and indirect methods of contouring. Use of planimeter for calculating areas. Interpolation of contours, preparing sections from contour maps, Plotting grade contours, trace inter section of the earth embankment with ground surface, errors in plotting of contours. Calculation of reservoir capacity from the contour map by trapezoidal and prismoidal formula.
3. Theodolite :- Types of theodolites, vernier, micrometer, component parts of a theodolite / <sup>size of theodolite</sup> Fundamental axes of a theodolite, Temporary adjustments, Face left and face right observations, Measurement of horizontal angles by repetition only. Setting out given horizontal angle, Measurement of vertical angle, checking verticality of a line, Miscellaneous operations with theodolite, measuring direct angles, measuring deflection angles, prolonging a straight line, fixing intermediate points.



- (4) Minor Instrument : Construction and use of optical square, hand level, Abney level, box sextant and ceylon ghat tracer. Use of planimeter <sup>and</sup> to calculate the area of irregular figure.
  
- (5) Setting of works : Final location survey, setting out on the ground the lines as shown on drawings and maps, setting of pegs for earth work as per given drawings such as formation width, top width, side slopes and gradient, Horizontal curves, designation of curve, types of curves, Elements of simple curve, offsets from long chord, offsets from chord produced, and deflection angle method, calculations for setting out curves, setting out curves on field.

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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOPAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY & MANAGEMENT.

COURSE : SURVEYING II.

COURSE CODE NO : CTM 402.

PREREQUISITE :- CTM 401

LIST OF PRACTICALS.

- (1) To find out the R.L. of the different points.
- (2) To check the R.L. of the given point performing <sup>fly</sup> levelling
- (3) To take the L.Section and Cross section of an existing road of a length 1/2 Km. <sup>and</sup> to plot them
- ;
- (4) To take the block levelling of undulated site and to check the contours.
- (5) To take the L.Section and Cross Section of line for drawing contour map.
- (6) Preparing a contour map of a small area by direct ~~run~~ : contouring method with the help of planetable and Dumpy level.
- (7) To draw a contour map of a small pond and to calculate its capacity.
- (8) Study of parts of a theodolite and their uses.
- (9) Temporary adjustment of a theodolite.
- (10) Measurement of a horizontal angle by repetition.
- (11) Measurement of a horizontal angle by Reiteration method.
- (12) Measurement of a vertical angle.

- (14) To find out the R.L. of a some available tall approachable object. Give the R.L. of a B.M.
- (15) To find out the height of a tall chimney or tower or lighting conductor.
- (16) Some uses of a theodolite e.g.
- (1) Prolonging a straight line.
  - (2) To check the verticality of Electric pole, corner of a building etc.
  - (3) To fix a points at the required angles.
- (17) Setting out a curve in field by following method
- (A) Offsets from Long chord.
  - (B) Offsets from Tangent.
  - (C) Offsets from Chord produced.
- (18) Use of Minor Instruments.

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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOPAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY AND MANAGEMENT.

COURSE : SURVEYING II.

COURSE CODE No. CTM : 402

PREREQUISITE : - CTM 401

REFERENCES :

- (1) Text Book of Surveying by S.K. Hussain.
- (2) -do- by T.F. Kanetkar
- (3) -do- by Punamia  
I & II.
- (4) Plane Surveying by David Clark.
- (5) Surveying by Foote & Davis.

PROGRAMME.      DIPLOMA IN CONSTRUCTION TECHNOLOGY AND MANAGEMENT.

COURSE        :    ENTREPRENEURSHIP.

COURSE CODE NO;    CIM 403

PREREQUISITE    :    -    NIL

R A T I O N A L E.

Since long entrepreneurship has been recognised as an essential ingredient of economic development. It has been varied from time to time to suit the changing socio-economic reality. It was applied to business for the first time in 18th Century, to designate a dealer who buys and sells goods at uncertain prices. An entrepreneur was considered a dynamic agent of change; or the catalyst who transformed increasingly physical, natural and human resources, into corresponding production possibilities. In recent years, managerial aspects of entrepreneurship are being emphasised. It employs innovativeness, an urge to take risk in face of uncertainties and on intuition, i.e. a capacity of seeing things in a way which afterwards proves to be true.

The subject is kept in Basic Technology under DCTM to bring to surface certain characteristics such as perception of economic opportunity, technical and organisational skills, managerial competence and motivation to achieve results.

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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOVAL.

PROGRAMME ; DIPLOMA IN CONSTRUCTION TECHNOLOGY & MANAGEMENT.

COURSE : ENTREPRENEURSHIP.

COURSE CODE NO. CTM- 403

PREREQUISITE : - Nil.

SCHEME OF STUDIES.

| <u>S.No.</u> | <u>TOPIC.</u>  | <u>TH. HRS.</u> | <u>PR. HRS.</u> | <u>TOTAL.</u> |
|--------------|--|-----------------|-----------------|---------------|
| 1.           | Entrepreneur ; His Qualities and Functions.  | 4               | -               | 4             |
| 2.           | Small scale Industry : Its growth and significance with relation to construction Industry. | 6               | -               | 6             |
| 3.           | Agencies for promotion and development of construction activity and construction material. |                 | -               | 8             |
| 4.           | Planning an Industrial unit for manufacture of building material.                          | 6               | -               | 6             |
| 5.           | Achievement Motivation.  | 4               | -               | 4             |
| 6.           | Project cost and its Financing for manufacture of Building material.                       | 8               | -               | 8             |
| 7.           | Planning and preparing of project report.  | 12              | -               | 12            |
|              |  | -----           |                 |               |
|              |  | Total           | hrs. 48 -       | 48            |
|              |  | -----           |                 |               |
|              |  | Credit          |                 | -3            |

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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOJAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY & MANAGEMENT.

COURSE : ENTREPRENEURSHIP.

COURSE CODE NO: CTM 403

PREREQUISITE : NIT

C O N T E N T S.

S.No. TOPIC, C O N T E N T S.

1. ENTREPRENEUR : Definition of an entrepreneur  
his qualities and Function. qualities of an entrepreneur/ contractor, Role and function.
2. SMALL SCALE INDUSTRY : Small Scale Industry  
Definition of / and Ancillary. Growth of small scale Industries in India in different sectors. Govt. Policies for S.S.I. Importance of small scale Industries Contribution of SSI in economic development.
3. AGENCIES FOR PROMOTION AND DEVELOPMENT : Government and non-Government schemes  
Non institutionalised benefits and incentives, infrastructures, Technical consultancy. Marketing- Govt . Institutionalised, Private. Requirements for setting up an Industrial Unit, various organisations fulfilling the requirements.
4. PLANNING AN INDUSTRIAL UNIT : Criteria for the selection of a small scale Industry, Feasible opportunities for business. Business opportunities, Projections and economic indicators. Process formalities for setting up of an S.S.I.
5. ACHIEVEMENT MOTIVATION : Objectives, goals and motivation importance of the clarity of objectives. Need for achievement motivation. Reinforcement with the help of games, quizzes and films. Planning Process- result oriented.
6. PROJECT COST AND ITS FINANCING : Estimation of cost of Production cost volume Profit relationship at different levels, Interpretation of financial statements, Institutionalised and non-institutionalised sources. Funds flow statements, Model loan application form with check list for appraisal.
7. PLANNING AND PREPARING OF PROJECT REPORT : Selection of Project, scheduling of activities involved Model format Preparation of Action Plan for implementation. Preparation of Project.

MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOPAL.

PROGRAMME. DIPLOMA IN CONSTRUCTION TECHNOLOGY & MANAGEMENT.

COURSE : ENTREPRENEURSHIP.

COURSE CODE NO : CIM- 413

PREREQUISITE : - NIL.

TERM WORK/PRACTICAL WORK.

- (1) (i) Arrange visits to small scale industries existing in the vicinity.  
(ii) Arrange group discussions with entrepreneurs and group members.
- (2) (i) Arrange market visits to get the idea about the market rates & compare the quality of goods and to develop the logical and analytical approach to purchase particular goods.  
(ii) Arrange market survey to get an idea from various sections of the Society for the perspective sale of the product.
- (3) Arrange market visits to decide the suitable modes of transportation and method of distribution among the purchaser.



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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOPAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY & MANAGEMENT.

COURSE : MECHANICS OF STRUCTURES.

COURSE CODE NO. : CTM 404

PREREQUISITE : 201

R A T I O N A L E.

Analysis of effect of a force system on a body or structure forms an important part of the study of engineering. The course of Engineering Mechanics considers the external effect due to action of forces. In this course the effect, internal to the body material due to the action of forces will be studied.

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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOPAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY & MANAGEMENT.

COURSE : MECHANICS OF STRUCTURE

COURSE CODE NO : CTM 404

PREREQUISITE : - 201

SCHEME OF STUDIES.

| <u>S.No.</u> | <u>TOPICS.</u>                  | <u>Th. Hrs.</u> | <u>Pr. Hr.</u> | <u>Total.</u> |
|--------------|---------------------------------|-----------------|----------------|---------------|
| (1)          | Stress and strain.              | 8               | -              | 8             |
| (2)          | Bending Moment and shear force. | 14              | -              | 14            |
| (3)          | Bending stress in Beams.        | 8               | -              | 8             |
| (4)          | Shearing stress in Beams.       | 6               | -              | 6             |
| (5)          | Slope and Deflection of Beams.  | 6               | -              | 6             |
| (6)          | Columns.                        | 6               | -              | 6             |
| (7)          | Fixed Beams.                    | 8               | -              | 8             |
| (8)          | Continuous Beams.               | 8               | -              | 8             |

Total period. 64 - 64

Rs. -----

Credits : 4

MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOPAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY & MANAGEMENT.  
COURSE : MECHANICS OF STRUCTURE.  
COURSE CODE NO : CTM 404  
PREREQUISITE : 201

C O N T E N T S.

1. STRESS AND STRAIN :

Concept of stress, Elasticity, elastic body, Internal resistance, Types of stress- Tensile, compressive and shear, strain, Hooke's law, Modulus of Elasticity, contraction/ Elongation in length, Tensile  $\frac{\text{stress}}{\text{strain}}$  on mild steel, working stress and factor of safety, Lateral strain, Poisson's ratio, change in lateral dimensions and volume, Modulus of rigidity, Relation between C, E, and K. Suddenly applied loads and corresponding stress/strain, Strain energy, Resilience, Proof resilience, modulus of resilience.

2. BENDING MOMENT AND SHEAR FORCE :

Types of beam- Statically determinate/indeterminate, cantilever, overhanging, types of support, computation of support reactions for point loads and u.d.l concept of B.M. and S.F. Necessity of sign convention in S.F. and B.M. Computations. Drawing of of S.F. and B.M. diagrams for simply supported and cantilever beam. Visualise the deflected shape of beam under loading. Point of contraflexure and its location in the deflected shape of the beam. Relation between B.M. and S.F. and loading rate.

3. BENDING STRESS IN BEAMS ;

Neutral axis and neutral layer. Compute moment of inertia  $I_{xx}$ ,  $I_{yy}$ ,  $I_{AB}$  etc. for rectangular, circular, triangular and I Sections. Parallel axis theorem. Stress distribution over the section indicating maximum Compressive and tensile stresses.  $\frac{M}{I} = \frac{f}{y} \frac{1}{R}$ , its understanding and application

(No derivation of the formula.)

Moment of resistance and its relation with maximum B.M., Section modulus and its importance. M.R. =  $f_{xz}$  -derivation from bending theory.

(4) SHEARING STRESS IN BEAMS :

Shear stress, Expression for shear stress  $q = \frac{F}{I_b} \frac{A}{Y}$  and its application ( No derivation ). Shear stress distribution over the sections (indicating maximum values) Rectangular section, I Section, T section, L section, Average and maximum shear stress for a rectangular section.

(5) SLOPE AND DEFLECTION OF BEAMS.

Concept of slope and deflection and their interrelation. Necessity of evaluation of slope and deflection, strength and stiffness against slope and deflection. Maximum slope and deflection values for Udl and Point loads on following beams (i) Cantilever (ii) Simply supported beam (iii) fixed beam (iv) continuous beam.

(6) COLUMNS

Radius of gyration and slenderness ratio End conditions, and equivalent length, / Classification as per mode of failure. Euler's and Rankine's formulae. Radius of gyration and slenderness ratio. Use of Euler's and Rankine's formulae in solving various problems.

(7) FIXED BEAM

Concept, Advantages & draw back, computation of i. l end moments for a fixed beam for following loading (i) Single point load- Central/eccentric (ii) Two point loads (iii) u.d.l. over entire span. Drawing of B.M. diagrams indicating the maximum +ve and -ve values. Maximum deflection formulae for simple cases.

(8) Continuous Beam

Concept, Advantages and draw backs, computation of FEM for a continuous beam. Clapeyron's theorem. Drawing the B.M. diagrams indicating the maximum +ve, and - ve values. Computation of support reactions.

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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOPAL.

PROGRAMME.        DIFICMA IN CONSTRUCTION TECHNOLOGY & MANAGEMENT.

COURSE    :        MECHANICS OF STRUCTURE.

COURSE CODE NO.    CTM 404

PREREQUISITE    :    -    201

REFERENCE BOOKS.

- (1) Strength of material            by K.D. Saxena.
- (2) Strength of material            by Ramamurtham.
- (3) Theory of structures Vol. I and Vol. II by Vazirani.
- (4) Strength of material Vol. I    by B.C. Punmiya.
- (5) Strength of material            by Timoshenko.
- (6) Strength of material            by- Sadhusingh.

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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOPAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY & MANAGEMENT.

COURSE : CIVIL ENGINEERING DRAWING.

COURSE CODE NO : CTM 405

PREREQUISITE : CTM 204

R A T I O N A L E.

In any Engineering, drawing plays an important part. Since the knowledge of this subject is required while planning, designing and executing the project.

The students should be well versed in this subject and should be able to read/interpret the drawing thoroughly and also able to draw the sketching/drawing correctly.

Keeping this view in P.C.T.M. Programme, the subject Drawing is kept in two parts named as "Elements of Civil Engineering Drawing" and "Civil Engineering Drawing."

At this level in "Civil Engineering Drawing" the Chapters of Drawing on more complicated Civil Engineering structure are included, e.g. Stair case, Residential building with pitched roof, double storeyed building etc.

Hope this course will fulfill the requirements of a technician in construction Technology and Management.

MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOPAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY & MANAGEMENT.

COURSE : CIVIL ENGINEERING DRAWING.

COURSE CODE NO; CTM 405

PREREQUISITE : CTM 204

SCHEME OF STUDIES.

| <u>S.No.</u> | <u>TOPIC.</u>   | <u>Theory Hrs.</u> | <u>Pr. Hrs.</u> | <u>Total.</u> |
|--------------|---|--------------------|-----------------|---------------|
| (1)          | Drawing of stair case.  | 6                  | 18              | 24            |
| (2)          | Single storyed Residential building with pitched roof.              | 4                  | 16              | 20            |
| (3)          | Double storeyed shop cum Residential building on framed structures. | 6                  | 20              | 26            |
| (4)          | Building services & their connections.                              | 6                  | 16              | 22            |
| (5)          | Modification in existing building.                                  | 4                  | 8               | 12            |
| (6)          | Small bridges and culverts.   | 6                  | 18              | 24            |
| Total        |   | 32                 | 96              | 128           |

Credit 5

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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOPAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY & MANAGEMENT.

COURSE : CIVIL ENGINEERING DRAWING- .

COURSE CODE NO : CIM 405

PRE REQUISITE : CIM 374

C O N T E N T S

TOPIC : 1 Drawing of Stair case:

Importance of stair case in building selection of proper utilised space for stair case.  
Types of stair case used in building i.e. straight Flight, Dogged legged, Openwel stair case.

TOPIC. 2. Single storeyed Residential building with pitched Roof.

Types of Roofs used as lean Toe roof, Timber truss, King post & Queen Post, Steel struss.  
Various members used in pitched Roof like Tie beam, principle Rafter, Ridge, Eve Board, Common Rafter, Furlin, Battens and Roof covering materials  
Tiles, A.C. sheets, G.I. sheets.

TOPIC 3. Double storeyed shop cum Residential building on framed structures.

Types of Framed structures like circular column, square columns with footing Details.

TOPIC 4. Building services and their connections.

Position of water supply fittings, laying of pipe line with accessories like Bend, Socket, Union, Elbow, Tee, Types of taps used. Laying of sewes line, position of inspection chamber, septic tank, Sanitary fittings, Position of wash basin sink etc.

TOPIC 5 Modification in existing building :

Addition and alterations to be incorporated in existing plan.

TOPIC.6 Small bridges and culverts :-

Pipe culvert drawing showing Number of pipes, face wall, splayed wing wall, Turn wall, Parapet wall Road way.  
Slab type bridge : Showing Abutment, Pier, Wing wall Parapet wall, Roadway.



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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOPAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY AND MANAGEMENT.

COURSE : CIVIL ENGINEERING DRAWING II

COURSE CODE NO; CTM 405

PREVIOUS COURSE : ... ..

RECOMMENDED PLATES TO BE DRAWN BY STUDENTS.

- (1) Drawing of stair case :- Two plates one straight Flight and openwell.  
One plate for Dogged legged Stair case.
- (2) Single storyed Residential building with pitched Roof including King post & Queen post, showing the joint.  
One sheet for Timber Truss  
One sheet for steel Truss.  
One sheet for Lean too Roof with Roof covering materials used like Tile, Half Round Tile, G.I. sheet, A.C. sheet Trafford type.
- (3) Double storyed shop cum Residential building on framed structures. Two sheets one sheet each of various combinations.
- (4) Building services and their connections. One Sheet showing layout plan of Water supply and Sanitary layout.
- (5) Modification in existing building. One sheet.
- (6) Small bridges and Culverts. Two sheet each for culvert and bridge.

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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOPAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY & MANAGEMENT.

COURSE : CIVIL ENGINEERING DRAWING III.

COURSE CODE NO: CIM-405

PREREQUISITE : - CIM 204

RECOMMENDED BOOKS.

- (1) Civil Engineering Drawing by Leo & Mallic
- (2) -do- by Verma.
- (3) Building construction by Sushil Kumar.
- (4) Civil Engg. Drawing by S.C. Pangwala.
- (5) Building Drawing by Shah, Kale and Patki- Tata Mcgraw Hills.
- (6) A course in Civil Draughtmanship.  
Hindi version by G.S. Birdi  
Dhanpat Rao & Sons  
Delhi.

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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOPAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY & MANAGEMENT.

COURSE : MATERIAL TECHNOLOGY.

COURSE CODE NO. CTM- 406

PREREQUISITE : Nil.

R A T I O N A L E.

Construction Technology and Management Technician has to work as a supervisor in the field of Civil Engineering construction works. He should therefore be in a position to select the proper material and use the same in the construction of a structure. Hence, he should know the properties, Tests (whenever required) and skills in selection of the materials.

The selection of materials and test should be accordingly to I.S. specifications.

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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHO PAL.

25/43

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY.

COURSE : MATERIAL TECHNOLOGY.

COURSE CODE NO: CTM 406

PREREQUISITE : - NIL.

SCHEME OF STUDIES.

| <u>S.No.</u> | <u>Topic.</u>                 | <u>Th.Hrs.</u> | <u>Pr.Hrs.</u> | <u>Total.</u> |
|--------------|-------------------------------|----------------|----------------|---------------|
| (1)          | Introduction.                 | 2              | -              | 2             |
| (2)          | Stones and sand.              | 7              | 10             | 17            |
| (3)          | Bricks.                       | 4              | 8              | 12            |
| (4)          | Binding Materials             |                |                |               |
|              | (a) Moorum.                   |                |                |               |
|              | (b) Lime.                     |                |                |               |
|              | (c) Cement.                   | 10             | 12             | 22            |
| (5)          | Timber.                       | 4              | 6              | 10            |
| (6)          | Paints, Varnish & colours.    | 4              | -              | 4             |
| (7)          | Flooring Materials.           | 4              | -              | 4             |
| (8)          | Roofing materials.            | 3              | -              | 3             |
| (9)          | Steel and Aluminium Products. | 2              | 4              | 6             |
| (10)         | Elastics.                     | 2              | -              | 2             |
| (11)         | Miscellaneous.                | 4              | -              | 4             |
| (12)         | Market Survey.                | 2              | 24             | 26            |

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 48                      64                      112  
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Credits - 5

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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOPAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY, & MANAGEMENT.  
COURSE : MATERIALS TECHNOLOGY.  
COURSE CODE NO: CTM 406  
PREREQUISITE : Nil.

TOPIC 1: INTRODUCTION

Importance of Material Technology for Civil Engineers.  
Ask the students to name the common Engineering materials they know.

TOPIC 2: STONE & AGGREGATE :

Classification of Rocks- Geological (Igneous, Sedimentary and Metamorphic).  
Properties of good building stones.  
Methods of Quarrying.  
Stone used as aggregate for Road construction with their various grades as per I.S.  
Use of aggregate for building work at various stages.  
Testing of aggregates.  
Sand, Its sources and properties and important tests.

TOPIC 3: BRICKS and its Properties

Method of preparation of bricks. Table moulded and Ground moulded Bricks.  
Burning of bricks Hoffmann's Continuous kiln  
Properties of good building bricks.  
Testing of bricks.

TOPIC 4: BINDING MATERIALS.

For low cost construction houses murrum used as binding material  
Properties of Murum for Road work.  
Lime used as binding Material.  
Types of lime :- Fat Lime, Hydraulic Lime, Quicklime  
Properties of lime.  
Cement Different ingredients used for manufacturing cement with their percentage  
Methods of preparation of Cement by i) Wet Process  
(ii) Dry process  
Testing of cement.  
Types of cement and their functional uses.

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TOPIC 5: TIMBER :- Difference between wood and timber. Timber to be used as an Engineering Material, Growth of Timber:- Exogdneous, Endogeneous, Defects in Timber- Knot, Twisted fibres, Rind gahl, Seasing of Timber, Preservation of timber Plywood, Verineers, Laminated plywood.

TOPIC 6: PAINTS, VARNISHES & COLOURS :

Different ingredients used in manufacturing/preparation of paints, Primers, their different types for steel and timber. Use of paint as protecting surface device for steel surface type of paint used and for wood surface types of paint used.

VARNISH : Method of preparation of Varnish, Component materials used in varnish.

COLOURS : For decorative purpose and finished purpose use of colour as water base, colour as oil base, Distemper and snowcem.

TOPIC 7: FLOORING MATERIALS :

Different types of floors used in buildings. Mud-floor, Flag stone floor, cement concrete floor, Mosaic flooring, Tile floors, ceramic tile floor, glazed floors, Wooden Floor's Glass floor.

TOPIC 8: ROOFING MATERIALS.

Roof covering Materials as Bamboo Mats, Galvanised iron sheets corrugated types, Asbestos cement sheet plain and Trafford type, Tiles,- Allahabad Tiles, Manglore tiles, Half Round tiles.

TOPIC 9: STEEL AND ALUMINIUM PRODUCTS.

Steel used as Engineering Material in different shapes, like T-section, Angle Section, Channel Section, I-Section. Steel sheets used in manufacturing of Doors. Aluminium: Used as construction materials.

TOPIC 10: PLASTICS : P.V.C. pipes used as a materials in pipe laying for water supply purposes, Irrigation etc. water tanks.

TOPIC 11: MISCELLANEOUS : Give the concepts about the other materials which can be used as Engineering Materials like Glass, Ribber, Tar, Emulsion, Bitumen, Glass wool, Use of J bolts, U Hooke's, Stoneware pipes, Galvenised iron pipes.

TOPIC 12: MARKET SURVEY :

Ask the students to collect the cost of items listed above and supplement the additional items with cost left at the time of listing of item.

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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHCAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY & MANAGEMENT.

COURSE : MATERIAL TECHNOLOGY

COURSE CODE NO: CTM 406

PREREQUISITE : - NIL.

LIST OF EXPERIMENTS.

- |                              |   |
|------------------------------|---|
| (1) GRADING OF AGGREGATE     | (1) Fineness Modulus of fine Aggregate.<br>(2) Fineness Modulus of Coarse Aggregate.<br>(3) Flakiness Index.<br>(4) Aggregate crushing test (Demonstration)<br>(5) Impact Test. |
| (2) TEST ON BRICKS.          | (1) Water Absorption Test.<br>(2) Compressive strength of bricks.<br>(3) Murrum Test.   |
| (3) TEST FOR CEMENT.         | (1) Fineness Modulus of cement.<br>(2) Normal consistency of cement.<br>(3) Setting time test initial and final.<br>(4) Tensile strength.                                       |
| (4) <u>TESTING</u> FOR STEEL | (1) Tensile strength of M.S. bar.<br>(2) Shear strength on M.S. bar.  |
| (5) TEST FOR TIMBER          | (1) Study of cross section of Timber.<br>(2) Identify the defects in Timber from given sample of test piece.<br>(3) Strength of Timber across the grains and the grains.        |
| (6) MARKET SURVEY.           | Study of different Engineering Materials used in construction work and their price.   |

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MADHYA PRADESH BOARD OF TECHNICAL EDUCATION,  
BHOPAL.

PROGRAMME : DIPLOMA IN CONSTRUCTION TECHNOLOGY & MANAGEMENT.

COURSE : MATERIAL TECHNOLOGY.

COURSE CODE NO: CTM 406

PREREQUISITE : - NIL.

RECOMMENDED BOOKS.

- (1) Engineering Materials. By Rangwala.
- (2) Engineering Materials. By Deshpande.
- (3) Engineering Materials. By Ojha.
- (4) Engineering Materials By Surendra Singh.