Curriculum structure for Part –III (3rd year) of the Full time Diploma Course in Mine Surveying

Note:

1. As per statutory provision of Directorate General of Mines Safety (DGMS) students have to undergo two months of Industrial Training after the completion of Part-II (Sem-IV) examination. Therefore, Industrial Training has been kept under the subject- Professional Practice-III and its syllabus has been framed accordingly.

2. Due to the two months of continuous Industrial Training, length of the session of Part-III (Semester-v) is reduced to **eight to nine weeks**. Therefore, weekly no. of periods for some important subjects has been increased to cover the syllabus properly.

3. **Total Marks-100** has been allotted to Professional Practice-III keeping in view the DGMS approval and importance of the Industrial Training for students of Mining Survey Dept.

### Table

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Subject</th>
<th>Credits</th>
<th>Periods</th>
<th>Evaluation Scheme</th>
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<td>TU</td>
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<td>3</td>
<td>Mine Surveying-I</td>
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<td>4</td>
<td>Land Laws and Mine Legislation</td>
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<td><strong>Grand Total</strong></td>
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<td>02</td>
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**Student Contact Hours Per Week: 33 Hours**

Theory and Practical period of 60 minutes each.

L-Lecture, TU-Tutorials, PR-Practical, TA-Teacher’s Assessment, CT-Class Test, ESE-End Semester Exam

Note:

1. As per statutory provision of Directorate General of Mines Safety (DGMS) students have to undergo two months of Industrial Training after the completion of Part-II (Sem-IV) examination. Therefore, Industrial Training has been kept under the subject- Professional Practice-III and its syllabus has been framed accordingly.

2. Due to the two months of continuous Industrial Training, length of the session of Part-III (Semester-v) is reduced to **eight to nine weeks**. Therefore, weekly no. of periods for some important subjects has been increased to cover the syllabus properly.

3. **Total Marks-100** has been allotted to Professional Practice-III keeping in view the DGMS approval and importance of the Industrial Training for students of Mining Survey Dept.
# SYLLABUS FOR ADVANCE SURVEYING-II

**Name of the Course:** Diploma in Mining Survey  
**Subject:** Advance Surveying-II  
**Subject Code:** MNSR/SS/T1/AS-II  
**Semester:** Fifth  
**Duration:** 6 months  
**Maximum Marks:** 200

<table>
<thead>
<tr>
<th>Teaching Scheme</th>
<th>Examination Scheme</th>
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<tr>
<td>Theory: 4 hours/week</td>
<td>Mid Semester Exam: 20 Marks</td>
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<tr>
<td>Tutorial: 1 hour/week</td>
<td>Attendance, Assignment &amp; Interaction: 10 Marks</td>
</tr>
<tr>
<td>Practical: 4 hrs/week</td>
<td>End Semester Exam: 70 Marks</td>
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<td>Credit: 4+2= 6</td>
<td>Practical (Internal + External)= 50+50=100</td>
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<tr>
<th>Sl. No.</th>
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<tr>
<td>1.</td>
<td>To impart basic knowledge of Triangulation, Trilateration and their Classification.</td>
</tr>
<tr>
<td>2.</td>
<td>To impart concept of triangulation figures and their strength.</td>
</tr>
<tr>
<td>3.</td>
<td>To develop skills of handling precise instruments and measuring baseline and angles.</td>
</tr>
<tr>
<td>4.</td>
<td>To make student able to differentiate between triangulation and trilateration.</td>
</tr>
<tr>
<td>5.</td>
<td>To make student able to solve numerical problems on triangulation and trilateration</td>
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</tbody>
</table>

**Objective:**

**After successful completion of this syllabus students will be able to**

<table>
<thead>
<tr>
<th>Sl. No.</th>
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<tbody>
<tr>
<td>1.</td>
<td>Understand triangulation and trilateration methods.</td>
</tr>
<tr>
<td>2.</td>
<td>Explain different triangulation figures and their strength.</td>
</tr>
<tr>
<td>3.</td>
<td>handle precise instruments and measure baseline and angles</td>
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</table>
4. Differentiate between triangulation and trilateration.

5. Solve numerical problems on triangulation and trilateration.

**Pre-Requisite:** Mathematics, Engineering Drawing

<table>
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<tr>
<th>DETAIL COURSE CONTENT (THEORY)</th>
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</thead>
<tbody>
<tr>
<td><strong>GROUP A</strong></td>
</tr>
<tr>
<td><strong>Unit 1</strong></td>
</tr>
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<td><strong>Module 1</strong></td>
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<td>TRIANGULATION</td>
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<td>2.1 Classification of triangulation system.</td>
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<td>2.2 Triangulation figures.</td>
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<td>2.3 Triangulation system adopted in India.</td>
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<td>2.4 Strength of figure.</td>
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<td>2.5 Selection of station.</td>
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<td>2.6 Observation of horizontal angles.</td>
</tr>
<tr>
<td>2.7 Base line extension.</td>
</tr>
<tr>
<td>2.8 Stations.</td>
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<tr>
<td>2.9 Base line measurement.</td>
</tr>
<tr>
<td>2.10 Different types of application of triangulation survey.</td>
</tr>
<tr>
<td>2.11 Adjustment of different types of triangulation figure by equal shift method only.</td>
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<tr>
<td>2.12 Numerical problems.</td>
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<td></td>
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**GROUP B**

| **Unit 2**                   |            |       |
| TRILATERATION                |            |       |
| 2.1 Introduction             |            |       |
| 2.2 Use of Trilateration     |            |       |
| 2.3 Advantage and Disadvantage of Trilateration | | |
| 2.4 Comparison of Trilateration with Triangulation | | |
| 2.5 Geometrical figures used in Trilateration | | |
| 2.6 Reconnaissance in Trilateration | | |
| 2.7 Precision in Trilateration | | |
| 2.8 Reduction of slope distance from vertical angles | | |
| 2.9 Reduction of slope distance from elevations | | |
| 2.10 Adjustment in Trilateration (Adjustment of a Braced Quadrilateral). | | |
| | 20 | |

**PRACTICAL** Code: MNSR/S5/P1/AS-II
1. Triangulation survey over a suitable ground.
2. Base-line measurement.
3. Plotting of the area with necessary correction.

<table>
<thead>
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<th>Unit</th>
<th>OBJECTIVE QUESTIONS</th>
<th>SUBJECTIVE QUESTIONS</th>
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Text/Reference Books:

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<tr>
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<th>Name of Authors</th>
<th>Name of the Publisher</th>
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<tbody>
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<td>Surveying(Vol- II)</td>
<td>S.Duggal</td>
<td>Tata McGraw Hill</td>
</tr>
<tr>
<td>Surveying &amp; Levelling</td>
<td>N. Basak</td>
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<td>Surveying &amp; Levelling(Vol-II)</td>
<td>T.P Kanetkar</td>
<td>Pune Vidyarthi Griha Prakashan</td>
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<td>Surveying(Vol- II)</td>
<td>Dr. K.R. Arora</td>
<td>Standard Book House</td>
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<td>Surveying(Vol- II)</td>
<td>Dr. B.C. Punamia</td>
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SYLLABUS FOR MODERN SURVEYING

Name of the Course: Diploma in Mining Survey

Subject: Modern Surveying

Subject Code: MNSR/S5/T2/MDS

Semester: Fifth

Duration: 6 months

Maximum Marks: 200

Teaching Scheme

Theory: 4 hours/week

Mid Semester Exam: 20 Marks

Tutorial: 1 hour/week

Attendance, Assignment & Interaction: 10 Marks

Practical: 4 hrs/week

End Semester Exam: 70 Marks

Credit: 4+2=6

Practical (Internal + External) = 50+50=100

Aim:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Aim</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>To describe constructional features of EDM, Digital Level, Total Station and Global Positioning System.</td>
</tr>
<tr>
<td>2.</td>
<td>To explain the procedures and steps involved in measurement with these instruments.</td>
</tr>
<tr>
<td>3.</td>
<td>To impart knowledge about the uses of these instruments.</td>
</tr>
<tr>
<td>4.</td>
<td>To give elementary idea about Remote sensing, Electromagnetic radiation and Interaction mechanism.</td>
</tr>
<tr>
<td>5.</td>
<td>To impart knowledge of different types and requirements of sensors.</td>
</tr>
<tr>
<td>6.</td>
<td>To give idea about Application of Remote sensing.</td>
</tr>
</tbody>
</table>
**Objective:**

**After successful completion of this syllabus students will be able to**

1. Understand and describe constructional features of EDM, Digital Level, Total Station and Global Positioning System.
2. Explain the procedures and steps involved in measurement with these instruments.
3. Handle these instruments and take measurement.
4. Understand the concept of Remote sensing, Electromagnetic radiation and Interaction mechanism.
5. Explain different types and requirements of sensors.
6. Apply the concept of Remote sensing in the field of surveying.
7. Describe the methods of finding out the tacheometric constants
8. Find out the horizontal/incline distance and RL of different stations using Tacheometric methods

**Pre-Requisite:** Basic Knowledge of Optics, Electronics and Electrical.

**DETAIL COURSE CONTENT (THEORY)**

<table>
<thead>
<tr>
<th>GROUP A</th>
<th></th>
<th></th>
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<tbody>
<tr>
<td><strong>Unit 1</strong></td>
<td><strong>MODERN SURVEY INSTRUMENTS</strong></td>
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<td>1.1.1. Introduction</td>
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<td>1.1.2. Basic definition</td>
<td>1.1.3. Measurement of Distance from of transit time</td>
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<tr>
<td>1.1.4. Measurement of Distance from of phase difference</td>
<td>1.1.5. Electro-Optical E.D.M. instruments</td>
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<td>1.1.6. Infrared E.D.M. instruments</td>
<td>1.1.7. Effect of atmospheric condition</td>
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<tr>
<td>1.1.8. Atmospheric calibration of instruments</td>
<td>1.1.9. Slope and height correction</td>
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<td>1.1.10. Use of E.D.M.</td>
<td>1.2. Digital Level – introduction and use.</td>
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</table>
1.3. Total station - introduction and use
1.4. Global positioning system - introduction and use

GROUP B

Unit 2

2.0 REMOTE SENSING

2.1 Introduction, Platforms for remote sensing, Electromagnetic radiation & Interaction mechanism, Wave theory and particle theory of electromagnetic radiation, Stefan –Boltzman law, Wein’s displacement law, Black body radiation.

2.2 Study of Electro- Optical sensors and optical infra-red sensors, Requirements of remote sensors, Photographic Camera, television Camera.

2.3 Spectral reflectance of vegetation, soil and water

2.4 Spectral reflectance of dubicious and coniferous trees.

PRACTICAL Code: MNSR/S5/P2/MDS

1. Handling of Total Station
2. Handling of GPS

EXAMINATION SCHEME

<table>
<thead>
<tr>
<th>GROUP</th>
<th>Unit</th>
<th>OBJECTIVE QUESTIONS</th>
<th>SUBJECTIVE QUESTIONS</th>
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<td></td>
<td></td>
<td>TO BE SET</td>
<td>TO BE ANSWERED</td>
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<tr>
<td>A</td>
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<th>Title of the Book</th>
<th>Name of Authors</th>
<th>Name of the Publisher</th>
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<tbody>
<tr>
<td>Advance Surveying-Tot al Station, GIS $Remote Sensing)</td>
<td>Satheesh Gopi</td>
<td>Pearson</td>
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<td>Author</td>
<td>Publisher</td>
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<tr>
<td>Surveying (Vol-III)</td>
<td>Dr. K.R. Arora</td>
<td>Standard Book House</td>
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<tr>
<td>Remote Sensing and Image Interpretation</td>
<td>Thomas N Lillesand</td>
<td>John Wiley &amp; Sons</td>
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<td>Higher Surveying</td>
<td>Subramanyam</td>
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### SYLLABUS FOR MINE SURVEYING-I

**Name of the Course:** Diploma in Mining Survey  
**Subject:** Mine Surveying-I  
**Subject Code:** MNSR/SS/T3/MS-I  
**Semester:** Fifth  
**Duration:** 6 months  
**Maximum Marks:** 200

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<th>Examination Scheme</th>
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<td>Theory: 4 hours/week</td>
<td>Mid Semester Exam:</td>
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<td>Tutorial: NIL</td>
<td>20 Marks</td>
</tr>
<tr>
<td>Practical: 4 hrs/week</td>
<td>Attendance, Assignment &amp; Interaction: 10 Marks</td>
</tr>
<tr>
<td>Credit: 4+2=6</td>
<td>End Semester Exam:</td>
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<tr>
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<td>70 Marks</td>
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<tr>
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<td>Practical( Internal + External)= 50+50=100</td>
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**Aim:**

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<tbody>
<tr>
<td>1.</td>
<td>To give introductory idea about use of Mine Correlation.</td>
</tr>
<tr>
<td>2.</td>
<td>To explain different methods of Mine correlation in different geo-mining conditions.</td>
</tr>
<tr>
<td>3.</td>
<td>To impart ideas about the steps of Joint survey between two mines in different geo-mining conditions.</td>
</tr>
<tr>
<td>4.</td>
<td>To impart concept of statutory provisions regarding joint survey between two mines</td>
</tr>
<tr>
<td>5.</td>
<td>To impart basic ideas of the principle of shaft surveying</td>
</tr>
<tr>
<td>6.</td>
<td>To impart knowledge about finding out the RL difference between shaft top and shaft bottom</td>
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**Objective:**

After successful completion of this syllabus students will be able to

<table>
<thead>
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<th>Sl. No.</th>
<th>Objective</th>
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<tbody>
<tr>
<td>1.</td>
<td>Develop idea about Mine correlation and uses of correlation.</td>
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</table>
2. Understand different methods of Mine correlation in different geo-mining conditions.

3. Describe and apply steps of Joint survey between two mines in different geo-mining conditions.

4. Understand statutory provisions regarding joint survey between two mines.

5. Develop idea about types and technique of measurement in shaft surveying.

**Pre-Requisite:** Basic knowledge of Mathematics, Physics and Engineering Drawing.

**DETAIL COURSE CONTENT**  (THEORY)

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<tr>
<th>GROUP A</th>
<th>Hours/Unit</th>
<th>Marks</th>
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<td><strong>Unit 1</strong></td>
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<td><strong>1.0 Mine Correlation</strong></td>
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<tr>
<td>1.1. Definition &amp; purpose of mine correlation.</td>
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</tr>
<tr>
<td>1.2. Different methods of correlation- Direct traversing through incline, Direct orientation by Optical methods, Orientation by wires in two shafts, correlation by wires in a single vertical shaft, co-planning or approximate alignment, weisbach method &amp; weiss quadrilateral method, magnetic method.</td>
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<tr>
<td>1.3. Gyroscopic method of correlation.</td>
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<tr>
<td>1.4. Laser–Gyro method of shaft Correlation</td>
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<tr>
<td>1.5. Sources of errors in correlation &amp; permissible errors</td>
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<td>1.6. Numerical problems</td>
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<th>GROUP B</th>
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<tr>
<td><strong>Unit 2</strong></td>
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<tr>
<td><strong>2.0 Joint Survey</strong></td>
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<td>2.1. Definition of Joint Survey</td>
<td></td>
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</tr>
<tr>
<td>2.2. Main features shown/Contents of joint survey plan</td>
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<tr>
<td>2.3. Utility of joint survey</td>
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<td>2.4. Instruments required &amp; Procedure of Joint Surveying when (a) both the mines have shafts (b) both the mines have inclines (c) one having shaft and other having incline mode of</td>
<td></td>
<td></td>
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</tbody>
</table>
entry
2.5 Execution of joint survey work
2.6 Precautions to be taken during joint survey work
2.7 Permissible limit of error in surface and underground correlation survey
2.8 Statutory Provisions

GROUP C

Unit 3
1.0 Shaft Survey
Choice of plumb wires and plumb- bob ; determination of mean position of swing, Keeping a sinking shaft (downward and upward) vertical; Inclined shafts- making and position of stations, setting up of instruments in the incline shaft.

PRACTICAL

. 1. Correlation of surface & underground survey.
  2. Plotting of the correlation survey.

EXAMINATION SCHEME

<table>
<thead>
<tr>
<th>GROUP</th>
<th>Unit</th>
<th>OBJECTIVE QUESTIONS</th>
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Text/Reference Books:

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<tr>
<th>Title of the Book</th>
<th>Name of Authors</th>
<th>Name of the Publisher</th>
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<tbody>
<tr>
<td>Surveying(Vol- II)</td>
<td>Dr. K.R. Arora</td>
<td>Standard Book House</td>
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<td>Plane Surveying</td>
<td>Alak De</td>
<td>S. Chand &amp;Company</td>
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<tr>
<td>Coal Mining Practice</td>
<td>I.C.F Statham</td>
<td>Caxton</td>
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<td>Mason Series</td>
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<td>Coal field Publication</td>
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<td>Coal Mines Regulation-1957</td>
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### SYLLABUS FOR LAND LAWS AND MINE LEGISLATION

**Name of the Course:** Diploma in Mining Survey

**Subject:** Land Laws and Mine Legislation

**Subject Code:** MNSR/SS/T4/LLML

**Semester:** Fifth

**Duration:** 6 months

**Maximum Marks:** 100

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<td>Tutorial: Nil</td>
<td>Attendance, Assignment &amp; Interaction: 10 Marks</td>
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<td>Practical: NIL</td>
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**Credit:** 4

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<td>2.</td>
<td>To impart introductory idea about Provisions of MINES &amp; MINERALS (REGULATION &amp; DEVELOPMENT) ACT, 1957</td>
</tr>
<tr>
<td>3.</td>
<td>To impart introductory idea about Provisions of Mines Act 1952</td>
</tr>
<tr>
<td>4.</td>
<td>To impart introductory idea about Provisions of Mines Rules 1955</td>
</tr>
<tr>
<td>5.</td>
<td>To impart introductory idea about Provisions of Coal Mines Regulations 1957</td>
</tr>
<tr>
<td>6.</td>
<td>To impart introductory idea about Provisions of Metaliferous Mines Regulations 1962</td>
</tr>
</tbody>
</table>

**Objective:**

**After successful completion of this syllabus students will be able to**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Explain the provisions as laid down under Land Acquisition Act 1894</td>
</tr>
<tr>
<td>2.</td>
<td>Explain the provisions as laid down under MINES &amp; MINERALS (REGULATION &amp; DEVELOPMENT) ACT, 1957</td>
</tr>
</tbody>
</table>
3. Explain the provisions as laid down under MINES ACT, 1952

4. Explain the provisions as laid down under MINES Rules, 1955

5. Explain the provisions as laid down under COAL MINES REGULATION, 1957


Pre-Requisite: NIL

### DETAIL COURSE CONTENT (THEORY)

<table>
<thead>
<tr>
<th>GROUP A</th>
<th>Hours/Unit</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1. LAND ACQUISITION ACT 1894</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Land Acquisition Act, 1894. Section – 1,4,5,6,7,8,9(1), 16, 17(1), 35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2. MINES &amp; MINERALS (REGULATION &amp; DEVELOPMENT) ACT, 1957</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sec-3 – Definition.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sec-4 to 11 – Salient Provisions.</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GROUP B</th>
<th>Mine Legislation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 2</strong></td>
<td></td>
</tr>
<tr>
<td>2.1 Mines Act -1952 &amp;Mines Rules-1955:</td>
<td></td>
</tr>
<tr>
<td>Definitions: Adult, Mine, Minerals, Open cast working, Reportable injury, Serious bodily injury, Week etc.</td>
<td></td>
</tr>
<tr>
<td>Main provisions like hours and limitations of employment, leave with wages.</td>
<td></td>
</tr>
<tr>
<td>2.2 Coal Mines Regulations 1957 &amp; Metaliferous Mines Regulations 1961</td>
<td></td>
</tr>
<tr>
<td>(a) Definitions: Coal, Committee, explosive, face, fiery seam, flame proof apparatus, goaf, inset, misfire, competent person, incline, shaft, winze or raise</td>
<td></td>
</tr>
<tr>
<td>Provisions regarding</td>
<td></td>
</tr>
<tr>
<td>(a) notice of abandonment or discontinuance</td>
<td></td>
</tr>
<tr>
<td>(b) Notice of Reopening</td>
<td></td>
</tr>
<tr>
<td>©Appointment of surveyors</td>
<td></td>
</tr>
<tr>
<td>(d) Duties and responsibilities of surveyor</td>
<td></td>
</tr>
<tr>
<td>(e) general requirement about mine plans</td>
<td></td>
</tr>
<tr>
<td>(f) Types of plan</td>
<td></td>
</tr>
<tr>
<td>(g) Copies of plans and sections to be submitted</td>
<td></td>
</tr>
<tr>
<td>(h) Copies of plans and sections to be submitted after abandonment or discontinuance</td>
<td></td>
</tr>
<tr>
<td>(i) Survey instruments and materials</td>
<td></td>
</tr>
</tbody>
</table>
(j) List of plans, sections and instruments and their storage  
(k) Preparation of plans by surveyors  
(l) Plans to be checked on change of ownership or on reopening etc.

### EXAMINATION SCHEME

<table>
<thead>
<tr>
<th>GROUP</th>
<th>Unit</th>
<th>OBJECTIVE QUESTIONS</th>
<th>SUBJECTIVE QUESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>TO BE SET</td>
<td>TO BE ANSWERED</td>
</tr>
<tr>
<td>A</td>
<td>1</td>
<td>10</td>
<td>ANY TWENTY</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

**Text/Reference Books:**

<table>
<thead>
<tr>
<th>Title of the Book</th>
<th>Name of Authors</th>
<th>Name of the Publisher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Acquisition Act-1894</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mines and Minerals(Regulation and Development) Act-1957</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coal Mines Regulation-1957</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metaliferous Mines Regulation-1961</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mines Act-1952</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mines Rules-1955</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Syllabus for Professional Practice-III

Name of the Course: Diploma in Mining Survey

Subject: Professional Practice-III

Subject Code: MNSR/SS/P4/PP-III

Semester: Fifth

Duration: 6 months

Maximum Marks: 100

Teaching Scheme

Theory: Nil

Tutorial: Nil

Practical: 3 hrs./week

Credit: 2

Mid Semester Exam:

Attendance, Assignment & Interaction: Continuous Assessment.

End Semester Exam:

Internal + External = 50+50 =100

Objective:

This subject contains two months continuous training in different coal and metal mines. Students will be able to develop concept about mines and their different activities. The following topics will guide them to understand different types of surveying and related measuring instruments. After completion of field training, through theoretical and practical classes, they will be guided to prepare the training report and present seminar.

<table>
<thead>
<tr>
<th>SL.NO.</th>
<th>Topics to be covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Curves in the underground haulage track, their position, designations with dimension. Methods adopted to set out levels in underground mines (in details), difficulties faced in underground curve setting, how the problems were overcome.</td>
</tr>
<tr>
<td>2</td>
<td>Whether any survey work done in the shaft/incline during your training period in that mine. If yes, then details of it. How the direction and gradient is maintained in the roadways and drivages. Centre line making and extension, volume calculation from face.</td>
</tr>
<tr>
<td>3</td>
<td>Whether triangulation done in the mine or not. If yes, then collect data</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>4</td>
<td>Combined surface plan, ventilation plan, water dam, working plan, dust plan, sampling plan, joint survey plan, and sectional view of prospecting borehole, study and collection of hand plan, super imposition of surface and underground plan.</td>
</tr>
<tr>
<td>5</td>
<td>Types of curves set in the mine, methods adopted, angle of deflection radius, super elevation.</td>
</tr>
<tr>
<td>6</td>
<td>Overview of correlation survey and joint survey. In case subsidence survey station fixing, interval of station, machine used and data collection and monitoring.</td>
</tr>
<tr>
<td>7</td>
<td>Organisational structure, various departments, incentive scheme (if any), Wages structures (nominal, real, living, minimum, fair, fall back).</td>
</tr>
<tr>
<td>8</td>
<td>Different statistical data of the mine related to depth, seam thickness, dip, geological disturbances, grade of coal, a brief history of the mine-related to opening, method of work etc. or any special feature exist in the mine.</td>
</tr>
<tr>
<td>9</td>
<td>Details of safety management (safety committee, internal safety organisation, workmen inspector, safety campaign etc.), Accident statistics of mine, details of an accident.</td>
</tr>
</tbody>
</table>