

**DEPARTMENT OF APPLIED GEOLOGY  
INDIAN SCHOOL OF MINES, DHANBAD**



**SYLLABUS**

**FOR**

**5-YEAR INTEGRATED M. SC. (TECH.) &  
3-YEAR M. SC. (TECH.)**

**IN**

**APPLIED GEOLOGY**

**Effective from 2008-2009**

Course structure for Five-year Integrated M. Sc. (Tech.) in Applied Geology

(Course to be effective from 2008-2009)

I Semester

Course No.	Courses	L T P	Credit
<b>Theory</b>			
AMC 11101	Mathematics-I	3 – 1 – 0	07
ACC 11101	Chemistry *	3 – 1 – 0	07
EIC 11101	Electronics Engineering *	3 – 1 – 0	07
HSC 11101	English for Science & Technology *	3 – 1 – 0	07
MMC 11102	Manufacturing Processes *	1 – 3 – 0	05
CSC 11301	Computer Programming (S) *	3 – 0 – 0	06
FMD/ESD 11301	Global Energy Scenario & Energy Security (S) *	3 – 0 – 0	06
<b>Practical</b>			
ACC 11201	Chemistry Practical *	0 – 0 – 3/2	01.5
EIC 11201	Electronics Engineering Practical *	0 – 0 – 3/2	01.5
DSW	Counseling / Special Class	0 – 0 – 0	00
Total		<b>19 – 7 – 3</b>	<b>48</b>

\* Depending on the Section allotted to the students, these subjects may be interchanged with the subjects marked as # in the II Semester.

II Semester

Course No.	Courses	L T P	Credit
<b>Theory</b>			
AMC 12101	Mathematics-II	3 – 1 – 0	07
APC 12101	Physics #	3 – 1 – 0	07
EEC 12101	Electrical Technology #	3 – 1 – 0	07
MMC 12103	Engineering Mechanics #	3 – 1 – 0	07
MMC 12103	Engineering Graphics #	1 – 3 – 0	05
HSC 12301	Value Education, Human Rights and Legislative Procedure (S) #	3 – 0 – 0	06
GLD/ESD 12301	Earth System Science (S) #	3 – 0 – 0	06
<b>Practical</b>			
APC 12202	Physics Practical #	0 – 0 – 3/2	01.5
MMC 12202	Electrical Technology Practical #	0 – 0 – 3/2	01.5
SWC 12701	Counseling / Special Class / Co-Curricular Activities	0 – 0 – 0	(03)
Total		<b>19 – 7 – 3</b>	<b>51</b>

# Depending on the Section allotted to the students, these subjects may be interchanged with the subjects marked as \* in the I Semester.

### III Semester

Course No.	Courses	L T P	Credit
<b>Theory</b>			
GLC 13101	Geology – I (Mineralogy, Petrology & Stratigraphy)	3 – 0 – 0	06
AMC 131xx	Methods of Applied Mathematics - I	4 – 1 – 0	09
APC 131xx	Mechanics	4 – 0 – 0	08
EIC 131xx	Communication Engineering	3 – 0 – 0	06
ACC 131xx	Inorganic Chemistry	3 – 1 – 0	07
<b>Practical</b>			
GLC 13201	Mineralogy and Petrology Practical	0 – 0 – 3	03
GLC 13202	Crystallography Practical	0 – 0 – 3	03
ACC 132xx	Inorganic Chemistry Practical	0 – 0 – 3	03
	Total	<b>17 – 2 – 9</b>	<b>45</b>

### IV Semester

Course No.	Courses	L T P	Credit
<b>Theory</b>			
GLC 14103	Geology – II (Physical and Structural Geology)	3 – 0 – 0	06
GLC 14104	Geology – III (Economic Geology)	3 – 0 – 0	06
GLC 14105	Geology – IV (Paleontology)	3 – 0 – 0	06
EEC 141xx	Applied Electrical Engineering	3 – 1 – 0	07
EIC 141xx	Microprocessors and their Applications	3 – 0 – 0	06
<b>Practical/Project/Seminar/Dissertation/Viva-voce</b>			
GLC 14203	Structural Geology Practical	0 – 0 – 3	03
GLC 14204	Economic Geology Practical	0 – 0 – 3	03
GLC 14205	Paleontology Practical	0 – 0 – 3	03
GLC 14906	Local Geological Field Excursion (S)*	0 – 0 – 0	04
SWC 14701	Co-Curricular Activity	0 – 0 – 0	03
	Total	<b>15 - 1 - 9</b>	<b>47</b>

\* Local Geological Field Excursion (2 weeks) with credit in IV<sup>th</sup> Semester.

V Semester

Course No.	Courses	L T P	Credit
<b>Theory</b>			
GLC 15111	Mineralogy	3 0 0	06
GLC 15112	Methods of Structural Geology	3 0 0	06
GLC 15113	Igneous Petrology	3 0 0	06
GLC 15114	Sedimentology	3 0 0	06
GLC 15115	Stratigraphy	4 0 0	08
<b>Practical</b>			
GLC 15211	Mineralogy Practical	0 0 3	03
GLC 15212	Methods of Structural Geology Practical	0 0 3	03
GLC 15213	Igneous Petrology Practical	0 0 3	03
GLC 15214	Sedimentology Practical	0 0 3	03
	Total	<b>16 0 12</b>	<b>44</b>

VI Semester

Course No.	Courses	L T P	Credit
<b>Theory</b>			
GLC 16116	Geochemistry and Isotope Geology	3 – 0 – 0	06
GLC 16117	Metamorphic Petrology	3 – 0 – 0	06
GLC 16118	Geotectonics	3 – 0 – 0	06
MEC 161xx	Surveying	3 – 0 – 0	06
AMC 161xx	Numerical and Statistical Methods	4 – 0 – 0	08
<b>Practical/Project/Seminar/Dissertation/Viva-voce</b>			
GLC 16216	Geochemistry and Isotope Geology Practical	0 – 0 – 3	03
GLC 16217	Metamorphic Petrology Practical	0 – 0 – 3	03
MEC 162xx	Surveying Practical	0 – 0 – 2/2	01
AMC 162xx	Numerical and Statistical Methods Practical	0 – 0 – 3	03
GLC 16919	Sedimentary Terrain Mapping Training (S) *	0 – 0 – 0	03
GLC 16920	Economic Geology Field Training (S) *	0 – 0 – 0	03
GLC 16521	Viva-voce	0 – 0 – 0	02
SWC 16701	Extra Curricular Activities	0 – 0 – 0	03
	Total	<b>16 – 0 – 10</b>	<b>53</b>

\* 2 weeks duration each, during winter vacation with credit in VI<sup>th</sup> Semester.

# Summer training during vacation after VI Semester with credit in VII<sup>th</sup> Semester.

VII Semester

Course No.	Courses	L T P	Credit
<b>Theory</b>			
GLC 17122	Kinematics of Rock Deformation	3 0 0	06
GLC 17123	Geostatistics	3 0 0	06
GLC 17124	Micropaleontology and Vertebrate Paleontology	3 0 0	06
MEC 171xx	Rock Mechanics	3 0 0	06
GPC 171xx	Geophysical Prospecting	3 0 0	06
<b>Practical</b>			
GLC 17222	Kinematics of Rock Deformation Practical	0 0 3	03
GLC 17223	Geostatistics Practical	0 0 3	03
GLC 17224	Micropaleontology and Vertebrate Paleontology Practical	0 0 3	
MEC 172xx	Rock Mechanics Practical	0 0 3	03
GPC 172xx	Geophysical Prospecting Practical	0 0 3	03
GLC 18825	Summer Training *	0 0 0	03
Total		<b>15 0 15</b>	<b>48</b>

\* Summer training during vacation after VI Semester with credit in VII<sup>th</sup> Semester.

VIII Semester

Course No.	Courses	L T P	Credit
<b>Theory</b>			
GLC 18126	Remote Sensing and GIS	4 0 0	08
GLC 18127	Geomorphology	3 0 0	06
GLC 18128	Computer Applications in Geology	3 0 0	06
GLC 18129	Petroleum Geology	3 0 0	06
MEC 18105	Mining Methods and Unit Operations	3 0 0	06
<b>Practical/Project/Seminar/Dissertation/Viva-voce</b>			
GLC 18226	Remote Sensing and GIS Practical	0 0 3	03
GLC 18227	Geomorphology Practical	0 0 3	03
GLC 18228	Computer Applications in Geology Practical	0 0 3	03
GLC 18229	Petroleum Geology Practical	0 0 3	03
GLC 18930	Geological Mapping Training *	0 0 0	03
GLC 18531	Viva-Voce	0 0 0	02
SWC 18701	Co-curricular Activity	0 0 0	03
Total		<b>16 0 12</b>	<b>52</b>

\*Geological Mapping Training camp of two weeks in deformed metamorphic/igneous terrain with credit in VIII<sup>th</sup> Semester.

# Summer training during vacation after VIII Semester with credit in IX<sup>th</sup> Semester.

## IX Semester

Course No.	Courses	L T P	Credit
<b>Theory</b>			
GLC 19132	Hydrogeology	3 0 0	06
GLC 19133	Exploration Geology and Mineral Economics	4 0 0	08
GLC 19134	Coal Geology	3 0 0	06
GLC 19135	Ore Geology	3 0 0	06
PEC 191xx	Petroleum Reservoir Engineering and Field Development	3 0 0	06
<b>Practical/Project/Seminar/Dissertation/Viva-voce</b>			
GLC 19232	Hydrogeology Practical	0 0 3	03
GLC 19233	Exploration Geology Practical	0 0 3	03
GLC 19234	Coal Geology Practical	0 0 3	03
GLC 19235	Ore Geology Practical	0 0 3	03
GLC 19536	Seminar	0 0 2	02
GLC 19837	Summer Training *	0 0 0	03
Total		<b>16 0 14</b>	<b>51</b>

\* Summer training during vacation after VIII Semester with credit in IX<sup>th</sup> Semester.

## X Semester

Course No.	Courses	L T P	Credit
<b>Theory</b>			
GLC 10138	Engineering Geology	3 0 0	06
GLC 10139	Environmental Geology	3 0 0	06
GLE 101xx	Elective (Any one of the following)	3 0 0	06
GLE 10140	Sequence Stratigraphy and Basin analysis		
GLE 10141	Coal Bed methane and Gas hydrate Exploration		
GLE 10142	Contaminant Hydrogeology		
GLE 10143	Nuclear Geology		
GLE 10144	Geotechnical Engineering		
FMC 10151	Mineral Beneficiation	3 0 0	06
MSC 10151	Industrial Management	3 0 0	06
<b>Practical/Project/Seminar/Dissertation/Viva-voce</b>			
GLC 10238	Engineering Geology Practical	0 0 3	03
FMC 10251	Mineral Beneficiation Practical	0 0 3	03
GLC 10845	Dissertation (Field work, Lab work and Seminar)*	0 0 6	06
GLC 10546	Composite Viva-voce	0 0 0	02
SWC 10701	Co-curricular Activity	0 0 0	03
Total		<b>15 0 12</b>	<b>47</b>

\* Dissertation fieldwork during winter vacation with credit in X<sup>th</sup> Semester.

Course structure for Three-year Integrated M. Sc. (Tech.) in Applied Geology

(Course to be effective from 2008-2009)

I Semester

Course No.	Courses	L T P	Credit
<b>Theory</b>			
GLC 21111	Mineralogy	3 0 0	06
GLC 21112	Methods of Structural Geology	3 0 0	06
GLC 21113	Igneous Petrology	3 0 0	06
GLC 21114	Sedimentology	3 0 0	06
GLC 21115	Stratigraphy	4 0 0	08
<b>Practical</b>			
GLC 21211	Mineralogy Practical	0 0 3	03
GLC 21212	Methods of Structural Geology Practical	0 0 3	03
GLC 21213	Igneous Petrology Practical	0 0 3	03
GLC 21214	Sedimentology Practical	0 0 3	03
	Total	<b>16 0 12</b>	<b>44</b>

II Semester

Course No.	Courses	L T P	Credit
<b>Theory</b>			
GLC 22116	Geochemistry and Isotope Geology	3 – 0 – 0	06
GLC 22117	Metamorphic Petrology	3 – 0 – 0	06
GLC 22118	Geotectonics	3 – 0 – 0	06
MEC 221xx	Surveying	3 – 0 – 0	06
AMC 221xx	Numerical and Statistical Methods	4 – 0 – 0	08
<b>Practical/Project/Seminar/Dissertation/Viva-voce</b>			
GLC 22216	Geochemistry and Isotope Geology Practical	0 – 0 – 3	03
GLC 22217	Metamorphic Petrology Practical	0 – 0 – 3	03
MEC 222xx	Surveying Practical	0 – 0 – 2/2	01
AMC 222xx	Numerical and Statistical Methods Practical	0 – 0 – 3	03
GLC 22919	Sedimentary Terrain Mapping Training (S) *	0 – 0 – 0	03
GLC 22920	Economic Geology Field Training (S) *	0 – 0 – 0	03
GLC 22521	Viva-voce	0 – 0 – 0	02
SWC 22701	Extra Curricular Activities	0 – 0 – 0	03
	Total	<b>16 – 0 – 10</b>	<b>53</b>

\* 2 weeks duration each, during winter vacation with credit in I<sup>st</sup> Semester.

# Summer training during vacation after II<sup>nd</sup> Semester with credit in III<sup>rd</sup> Semester.

### III Semester

Course No.	Courses	L T P	Credit
<b>Theory</b>			
GLC 23122	Kinematics of Rock Deformation	3 0 0	06
GLC 23123	Geostatistics	3 0 0	06
GLC 23124	Micropaleontology and Vertebrate Paleontology	3 0 0	06
MEC 231xx	Rock Mechanics	3 0 0	06
GPC 231xx	Geophysical Prospecting	3 0 0	06
<b>Practical</b>			
GLC 23222	Kinematics of Rock Deformation Practical	0 0 3	03
GLC 23223	Geostatistics Practical	0 0 3	03
GLC 23224	Micropaleontology and Vertebrate Paleontology Practical	0 0 3	
MEC 232xx	Rock Mechanics Practical	0 0 3	03
GPC 232xx	Geophysical Prospecting Practical	0 0 3	03
GLC 23825	Summer Training *	0 0 0	03
Total		<b>15 0 15</b>	<b>48</b>

\* Summer training during vacation after II<sup>nd</sup> Semester with credit in III<sup>rd</sup> Semester.

### IV Semester

Course No.	Courses	L T P	Credit
<b>Theory</b>			
GLC 24126	Remote Sensing and GIS	4 0 0	08
GLC 24127	Geomorphology	3 0 0	06
GLC 24128	Computer Applications in Geology	3 0 0	06
GLC 24129	Petroleum Geology	3 0 0	06
MEC 24105	Mining Methods and Unit Operations	3 0 0	06
<b>Practical/Project/Seminar/Dissertation/Viva-voce</b>			
GLC 24226	Remote Sensing and GIS Practical	0 0 3	03
GLC 24227	Geomorphology Practical	0 0 3	03
GLC 24228	Computer Applications in Geology Practical	0 0 3	03
GLC 24229	Petroleum Geology Practical	0 0 3	03
GLC 24930	Geological Mapping Training *	0 0 0	03
GLC 24531	Viva-Voce	0 0 0	02
SWC 24701	Co-curricular Activity	0 0 0	03
Total		<b>16 0 12</b>	<b>52</b>

\*Geological Mapping Training camp of two weeks in deformed metamorphic/igneous terrain during winter vacation.

# Summer training during vacation after IV<sup>th</sup> Semester with credit in V<sup>th</sup> Semester.



V Semester

Course No.	Courses	L T P	Credit
<b>Theory</b>			
GLC 25132	Hydrogeology	3 0 0	06
GLC 25133	Exploration Geology and Mineral Economics	4 0 0	08
GLC 25134	Coal Geology	3 0 0	06
GLC 25135	Ore Geology	3 0 0	06
PEC 251xx	Petroleum Reservoir Engineering and Field Development	3 0 0	06
<b>Practical/Project/Seminar/Dissertation/Viva-voce</b>			
GLC 25232	Hydrogeology Practical	0 0 3	03
GLC 25233	Exploration Geology Practical	0 0 3	03
GLC 25234	Coal Geology Practical	0 0 3	03
GLC 25235	Ore Geology Practical	0 0 3	03
GLC 25536	Seminar	0 0 2	02
GLC 25837	Summer Training *	0 0 0	03
Total		<b>16 0 14</b>	<b>51</b>

\* Summer training during vacation after IV<sup>th</sup> Semester with credit in V<sup>th</sup> Semester.

VI Semester

Course No.	Courses	L T P	Credit
<b>Theory</b>			
GLC 26138	Engineering Geology	3 0 0	06
GLC 26139	Environmental Geology	3 0 0	06
GLE 261xx	Elective (Any one of the following)	3 0 0	06
GLE 26140	Sequence Stratigraphy and Basin analysis		
GLE 26141	Coal Bed methane and Gas hydrate Exploration		
GLE 26142	Contaminant Hydrogeology		
GLE 26143	Nuclear Geology		
GLE 26144	Geotechnical Engineering		
FMC 26151	Mineral Beneficiation	3 0 0	06
MSC 26151	Industrial Management	3 0 0	06
<b>Practical/Project/Seminar/Dissertation/Viva-voce</b>			
GLC 26238	Engineering Geology Practical	0 0 3	03
FMC 26251	Mineral Beneficiation Practical	0 0 3	03
GLC 26845	Dissertation (Field work, Lab work and Seminar)*	0 0 6	06
GLC 26546	Composite Viva-voce	0 0 0	02
SWC 26701	Co-curricular Activity	0 0 0	03
Total		<b>15 0 12</b>	<b>47</b>

\* Dissertation fieldwork during winter vacation with credit in V<sup>th</sup> Semester.