

4-Year, B. Tech.- Geological Engineering

B. Tech. 1st Semester Course Structure

| Sl. | Course Type | Course Code | Course Name | L-T-P | Course Category | Credits |
|-----|-------------|-------------|---------------------------------------|-------|-----------------|-------------|
| 1 | IDC1 | NMCI101 | Engineering Mathematics - I | 3-0-0 | Theory | 3 |
| 2 | DSC1 | NGLC101 | Earth System and Processes | 3-0-0 | Theory | 3 |
| 3 | DSC2 | NGLC102 | Earth System and Processes Practical | 0-0-2 | Practical | 1 |
| 4 | ESC1 | NPEE101 | Introduction to Petroleum Engineering | 3-0-0 | Theory | 3 |
| 5 | AEC1 | NHSA103 | Understanding Human Behaviour | 2-1-0 | Theory | 3 |
| 6 | SEC1 | NMES101 | Manufacturing Process | 2-0-3 | Practical | 3.5 |
| 7 | VAC1 | NCSV101 | Computer Programming | 3-0-0 | Theory | 3 |
| 8 | VAC2 | NCSV102 | Computer Programming Lab | 0-0-2 | Practical | 1 |
| | | | | | | 20.5 |

B. Tech. 2nd Semester Course Structure

| Sl. | Course Type | Course Code | Course Name | L-T-P | Course Category | Credits |
|-----|-------------|-------------|------------------------------|-------|-----------------|-------------|
| 1 | IDC2 | NPHI101 | Engineering Physics | 3-0-0 | Theory | 3 |
| 2 | IDC3 | NPHI102 | Engineering Physics Lab | 0-0-2 | Practical | 1 |
| 3 | IDC4 | NMCI102 | Engineering Mathematics - II | 3-0-0 | Theory | 3 |
| 4 | DSC3 | NMNC103 | Elements of Mining | 3-0-0 | Theory | 3 |
| 5 | DSC4 | NMNC104 | Mine Model Laboratory | 0-0-2 | Practical | 1 |
| 6 | ESC2 | NFME102 | Basic of Mineral Engineering | 3-0-0 | Theory | 3 |
| 7 | AEC2 | NHSA101 | Communication Skills | 1-0-0 | Theory | 1 |
| 8 | AEC3 | NHSA102 | Communication Skills Lab | 0-0-2 | Practical | 1 |
| 9 | SEC2 | NCES101 | Engineering Graphics | 1-0-3 | Theory | 2.5 |
| 10 | VAC3 | NESV101 | Environmental Science | 3-0-0 | Theory | 3 |
| | | | | | | 21.5 |

B. Tech. 3rd Semester Course Structure

| Sl. | Course Type | Course Code | Course Name | L-T-P | Course Category | Credits |
|-----|-------------|----------------|---|-------|-----------------|-----------|
| 1 | DC3 | NPEC201 | Drilling Technology - I | 3-1-0 | Theory | 4 |
| 2 | DC4 | NGLC212 | Fundamentals of Crystallography, Mineralogy, and Geochemistry | 3-1-0 | Theory | 4 |
| 3 | DC5 | NGLC213 | Petrology | 3-1-0 | Theory | 4 |
| 4 | DP3 | NGLC214 | Fundamentals of Crystallography, Mineralogy, and Geochemistry Practical | 0-0-2 | Practical | 1 |
| 5 | DP4 | NGLC215 | Petrology Practical | 0-0-2 | Practical | 1 |
| 6 | ESC3 | NGPE201 | Introduction to Near Surface Geophysics | 3-0-0 | Theory | 3 |
| 7 | AEC4 | NESA201 | Environmental Policy and Legislation | 3-0-0 | Theory | 3 |
| | | | | | | 20 |

B. Tech. 4th Semester Course Structure

| Sl. | Course Type | Course Code | Course Name | L-T-P | Course Category | Credits |
|-----|---|----------------|--|-------------|-----------------|-----------|
| 1 | DC6 | NPEC207 | Applied Reservoir Engineering | 3-1-0 | Theory | 4 |
| 2 | DC7 | NMNC202 | Rock Mechanics | 3-1-0 | Theory | 4 |
| 3 | DC8 | NGLC208 | Principles of Remote Sensing and GIS | 3-1-0 | Theory | 4 |
| 4 | DP5 | NGLC216 | Principles of Remote Sensing and GIS Practical | 0-0-2 | Practical | 1 |
| 5 | DP6 | NMNC205 | Rock Mechanics Practical | 0-0-2 | Practical | 1 |
| 6 | ESC4 | NMNE202 | Introduction to Mine Environment | 3-0-0 | Theory | 3 |
| 7 | SEC4 | NPHS201 | Python for Science and Engineering | 3-0-0 | Theory | 3 |
| 8 | Vocational Training / Excursion / Field Visit | NGLC211 | Local Excursion/Field Visit | 0-0-0 (S/X) | Audit | 0 |
| | | | | | | 20 |

B. Tech. 5th Semester Course Structure

| Sl. | Course Type | Course Code | Course Name | L-T-P | Course Category | Credits |
|-----|----------------------------|-------------|--|-------|-----------------|-------------|
| 1 | DC9 | NGLC301 | Structural Geology | 3-1-0 | Theory | 4 |
| 2 | DC10 | NMCC305 | Mathematical Foundation for Machine Learning | 3-1-0 | Theory | 4 |
| 3 | DE1 | | <i>To be chosen from the pool of DE courses</i> | 3-0-0 | Theory | 3 |
| 4 | DP7 | NGLC304 | Structural Geology Practical | 0-0-2 | Practical | 1 |
| 5 | DP8 | NMCC307 | Mathematical Foundation for Machine Learning Laboratory | 0-0-2 | Practical | 1 |
| 6 | HSSE1 | | <i>To be chosen from the HSS pool. HSS department to contribute courses to the pool below.</i> | 3-0-0 | Theory | 3 |
| 7 | DC1 (Minor)/ DC1 (Hons) | | <i>from the pool of Minor/Honors</i> | 3-1-0 | Theory | 4 |
| 8 | SDC1(Minor)/ DP1(Hons) | | <i>from the pool of Minor/Honors</i> | 0-0-3 | Practical | 1.5 |
| | | | | | | 21.5 |

B. Tech. 6th Semester Course Structure

| Sl. | Course Type | Course Code | Course Name | L-T-P | Course Category | Credits |
|-----|---|----------------|--|-------------|-----------------|-------------|
| 1 | DC11 | NGLC312 | Geology of Ore Deposits | 3-1-0 | Theory | 4 |
| 2 | DC12 | NGLC406 | Exploration Geology and Mineral Economics | 3-1-0 | Theory | 4 |
| 3 | DE2 | | <i>To be chosen from the pool of DE courses</i> | 3-0-0 | Theory | 3 |
| 4 | DP9 | NGLC412 | Exploration Geology and Mineral Economics Practical | 0-0-2 | Practical | 1 |
| 5 | HSSE2 | | <i>To be chosen from the HSS pool. HSS department to contribute courses to the pool below.</i> | 3-0-0 | Theory | 3 |
| 6 | DC2 (Minor)/ DC2 (Hons) | | <i>from the pool of Minor/Honors</i> | 3-1-0 | Theory | 4 |
| 7 | SDC2 (Minor)/ DP2 (Hons) | | <i>from the pool of Minor/Honors</i> | 0-0-3 | Practical | 1.5 |
| 8 | Vocational Training / Excursion / Field Visit | NGLC311 | Sedimentary Field Training | 0-0-0 (S/X) | Audit | 0 |
| | | | | | | 20.5 |

| B. Tech. 7th Semester Course Structure | | | | | | | B. Tech. 8th Semester Course Structure | | | | | | |
|--|-----------------------------|-------------|--|-------|-----------------|---------|--|-----------------------------|-------------|-------------------------------|-------|-----------------|---------|
| Sl. | Course Type | Course Code | Course Name | L-T-P | Course Category | Credits | Sl. | Course Type | Course Code | Course Name | L-T-P | Course Category | Credits |
| 1 | DE3 | | To be chosen from the pool of DE courses | 3-0-0 | Theory | 3 | 1 | DC4 (Minor)/ DC4 (Hons) | | from the pool of Minor/Honors | 3-1-0 | Theory | 4 |
| 2 | DE4 | | To be chosen from the pool of DE courses | 3-0-0 | Theory | 3 | 2 | DC5 (Minor)/ DC5 (Hons) | | from the pool of Minor/Honors | 3-1-0 | Theory | 4 |
| 3 | DC3 (Minor)/ DC3 (Hons) | | from the pool of Minor/Honors | 3-1-0 | Theory | 4 | 3 | SDC4 (Minor)/ DP4 (Hons) | | from the pool of Minor/Honors | 0-0-3 | Practical | 1.5 |
| 4 | SDC3 (Minor)/ DP3 (Hons) | | from the pool of Minor/Honors | 0-0-3 | Practical | 1.5 | 4 | Project | NCEC402 | Project - II | 8-0-0 | Project | 8 |
| 5 | Project | NCEC401 | Project - I | 8-0-0 | Project | 8 | | | | | | | 17.5 |
| 6 | Internship | NCES401 | Internship | 0-0-0 | Internship | 4 | | | | | | | |
| | | | | | | 23.5 | | | | | | | |

POOLS/TABLES

| MINOR TABLE | | | | | | | HONORS TABLE | | | | | | | |
|-------------------|--------------|-------------|--|-------|-----------------|---------|-------------------|-----|-------------|-------------|---|-------|-----------------|---------|
| Title of Minor | | | Geology | | | | Session | | | | | | | |
| Sl. | Course Type | Course Code | Course Name | L-T-P | Course Category | Credits | | Sl. | Course Type | Course Code | Course Name | L-T-P | Course Category | Credits |
| 1 | DC1 (Minor) | NGLC201 | Crystallography and Optical Mineralogy | 3-1-0 | Theory | 4 | Monsoon | 1 | DC (Hons) | NGLH301 | Geomechanics | 3-1-0 | Theory | 4 |
| 2 | SDC1 (Minor) | NGLC204 | Crystallography and Mineralogy Practical | 0-0-3 | Practical | 1.5 | Monsoon | 2 | DP (Hons) | NGLH302 | Geomechanics Practical | 0-0-3 | Practical | 1.5 |
| 3 | DC2 (Minor) | NGLC206 | Petrogenesis of Igneous Rocks | 3-1-0 | Theory | 4 | Winter | 3 | DC (Hons) | NGLH303 | Petroleum Geology | 3-1-0 | Theory | 4 |
| 4 | SDC2 (Minor) | NGLM302 | Igneous Petrogenesis Practical | 0-0-3 | Practical | 1.5 | Winter | 4 | DP (Hons) | NGLH304 | Petroleum Geology Practical | 0-0-3 | Practical | 1.5 |
| 5 | DC3 (Minor) | NGLC503 | Methods of Structural Geology | 3-1-0 | Theory | 4 | Monsoon | 5 | DC (Hons) | NGLH401 | Fundamentals of Coal Geology | 3-1-0 | Theory | 4 |
| 6 | SDC3 (Minor) | NGLM401 | Introduction to Structural Geology Practical | 0-0-3 | Practical | 1.5 | Monsoon | 6 | DP (Hons) | NGLH402 | Fundamentals of Coal Geology Practical | 0-0-3 | Practical | 1.5 |
| 7 | DC4 (Minor) | NGLC522 | Metamorphic Petrology | 3-1-0 | Theory | 4 | Winter | 7 | DC (Hons) | NGLH403 | Geological Engineering Site Investigation | 3-1-0 | Theory | 4 |
| 8 | DC5 (Minor) | NGLC516 | Remote Sensing and GIS | 3-1-0 | Theory | 4 | Winter | 8 | DC (Hons) | NGLH404 | Geostatistics & Mining Geology | 3-1-0 | Theory | 4 |
| 9 | SDC4 (Minor) | NGLM402 | Basics of Metamorphic Petrology Practical | 0-0-3 | Practical | 1.5 | Winter | 9 | DP (Hons) | NGLH405 | Geostatistics & Mining Geology Practical | 0-0-3 | Practical | 1.5 |
| 26 - Minor | | | | | | | 26 - Hons. | | | | | | | |

| POOL of ESC (except MS & HSS) | | | | | | | POOL of AEC (except HSS) | | | | | | | |
|-------------------------------|-------------|-------------|--------------------------------------|-------|-----------------|---------|--------------------------|-----|-------------|-------------|---------------------------|-------|-----------------|---------|
| Sl. | Course Type | Course Code | Course Name | L-T-P | Course Category | Credits | Session | Sl. | Course Type | Course Code | Course Name | L-T-P | Course Category | Credits |
| 1 | ESC3 | NGLE201 | Geology for Engineering and Sciences | 3-0-0 | Theory | 3 | Monsoon | 1 | AEC4 | NGLA201 | Introduction to Petrology | 3-0-0 | Theory | 3 |
| 2 | ESC4 | NGLE202 | Water Resources Management | 3-0-0 | Theory | 3 | Winter | 2 | AEC | | | 3-0-0 | Theory | 3 |

| POOL of SEC (except HSS) | | | | | | | |
|--------------------------|-------------|-------------|--|-------|-----------------|---------|---------|
| Sl. | Course Type | Course Code | Course Name | L-T-P | Course Category | Credits | Session |
| 1 | SEC4 | | | 3-0-0 | Theory | 3 | Monsoon |
| 2 | SEC4 | NGLS201 | Fundamentals of Georesources and Processes | 3-0-0 | Theory | 3 | Winter |

POOL of DE (except MS & HSS)

| Sl. | Course Type | Course Code | Course Name | L-T-P | Course Category | Credits |
|-----|-------------|-------------|---|-------|-----------------|---------|
| 1 | DE | NGLD301 | Environmental Geology | 3-0-0 | Theory | 3 |
| 2 | DE | NGLD302 | Hyperspectral Remote Sensing & Its Applications | 3-0-0 | Theory | 3 |
| 3 | DE | NGLD303 | Applications of Geophysical Methods | 3-0-0 | Theory | 3 |
| 4 | DE | NGLD304 | Geoarchaeology | 3-0-0 | Theory | 3 |
| 5 | DE | NGLD305 | Coal Bed Methane, Shale Gas and Gas Hydrate Exploration | 3-0-0 | Theory | 3 |
| 6 | DE | NGLD306 | Micropaleontology and Vertebrate Palaeontology | 3-0-0 | Theory | 3 |
| 7 | DE | NGLD307 | Fundamentals of Atmosphere, Ocean, and Climate Dynamics | 3-0-0 | Theory | 3 |
| 8 | DE | NGLD308 | Rock Slope Engineering | 3-0-0 | Theory | 3 |
| 9 | DE | NGLD309 | Archaeometallurgy | 3-0-0 | Theory | 3 |
| 10 | DE | NGLD401 | Introduction to Sedimentary Environment | 3-0-0 | Theory | 3 |
| 11 | DE | NGLD403 | Fundamentals of Rock Engineering | 3-0-0 | Theory | 3 |
| 12 | DE | NGLD404 | Kinematics of Rock Deformation | 3-0-0 | Theory | 3 |
| 13 | DE | NGLD405 | Well Logging | 3-0-0 | Theory | 3 |
| 14 | DE | NGLD406 | Nanotechnology in Mineral and Hydrocarbon Exploration | 3-0-0 | Theory | 3 |
| 15 | DE | NGLD407 | Radiogenic and Stable Isotope Geology | 3-0-0 | Theory | 3 |
| 16 | DE | NGLD402 | Critical Minerals: Nature, Recovery and Uses | 3-0-0 | Theory | 3 |
| 17 | DE | NGLD409 | Engineering Geology | 3-0-0 | Theory | 3 |
| 18 | DE | NGLD408 | Hydrogeology | 3-0-0 | Theory | 3 |