KALINGA UNIVERSITY

RAIPUR | INDIA

SCHEME & SYLLABUS FOR

Bachelor of Vocational Studies (B.Voc.)

Safety in Construction

(W.e.f. 2025 – 2026)

NAAC GRADE B+ Accredited University

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Kalinga University, Naya Raipur, Chhattisgarh

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B.VOC IN SAFETY IN CONSTRUCTION

Semester-01								
Course Code	**Course Title**	**Credits**	**L**	**T**	**P**	**Internal Marks**	**End Semester Exam Marks**	**Total Marks**
BVSIC101	Construction Fundamentals & Safety Induction	4	3	1	0	30	70	100
BVSIC102	Hazard Control & Emergency Preparedness	4	3	1	0	30	70	100
BVSIC103	Safety Compliance & Regulatory Standards -I	4	3	1	0	30	70	100
BVSIC104P	Construction Fundamentals & Safety Induction -Lab	2	0	0	4	20	30	50
BVSIC105P	Hazard Control & Emergency Preparedness- Lab	2	0	0	4	20	30	50
BVSIC106P	Safety Compliance & Regulatory Standards -I- Lab	6	0	0	12	50	100	150
BVSIC107P	**Integrated Safety, Leadership & Applied Skills -I-Lab**	8	0	0	16	50	150	200
Total		**30**	**9**	**3**	**36**	**230**	**520**	**750**

Semester-02								
Course Code	**Course Title**	**Credits**	**L**	**T**	**P**	**Internal Marks**	**End Semester Exam Marks**	**Total Marks**
BVSIC201	Advance Construction Hazard & Risk Management	4	3	1	0	30	70	100
BVSIC202	Fire & Disaster Management	4	3	1	0	30	70	100
BVSIC203	Safety Compliance & Regulatory Standards -II	4	3	1	0	30	70	100
BVSIC204P	Advance Construction Hazard & Risk Management-Lab	2	0	0	4	20	30	50
BVSIC205P	Fire & Disaster Management-Lab	2	0	0	4	20	30	50
BVSIC206P	Safety Compliance & Regulatory Standards-II-Lab	6	0	0	12	50	100	150
BVSIC207P	**Integrated Safety, Leadership & Applied Skills-II-Lab**	8	0	0	16	50	150	200
Total		**30**	**9**	**3**	**36**	**230**	**520**	**750**

Semester-03								
Course Code	**Course Title**	**Credits**	**L**	**T**	**P**	**Internal Marks**	**End Semester Exam Marks**	**Total Marks**
BVSIC301	Construction Equipment Safety & Maintenance	4	3	1	0	30	70	100
BVSIC302	Occupational Health & Industrial Hygiene	4	3	1	0	30	70	100
BVSIC303	Electrical & Mechanical Safety	4	3	1	0	30	70	100
BVSIC304P	Construction Equipment Safety & Maintenance-Lab	2	0	0	4	20	30	50
BVSIC305P	Occupational Health & Industrial Hygiene-Lab	2	0	0	4	20	30	50
BVSIC306P	Electrical & Mechanical Safety-Lab	6	0	0	12	50	100	150
BVSIC307P	**Integrated Safety, Leadership & Applied Skills-III-Lab**	8	0	0	16	50	150	200
Total		**30**	**9**	**3**	**36**	**230**	**520**	**750**

Semester-04								
Course Code	**Course Title**	**Credits**	**L**	**T**	**P**	**Internal Marks**	**End Semester Exam Marks**	**Total Marks**
BVSIC401	Working at Height & Confined Space Safety	4	3	1	0	30	70	100
BVSIC402	Environmental Safety & Sustainability	4	3	1	0	30	70	100
BVSIC403	Construction Quality & Safety Integration	4	3	1	0	30	70	100
BVSIC404P	Working at Height & Confined Space Safety-Lab	2	0	0	4	20	30	50
BVSIC405P	Environmental Safety & Sustainability-Lab	2	0	0	4	20	30	50
BVSIC406P	Construction Quality & Safety Integration-Lab	6	0	0	12	50	100	150
BVSIC407P	**Integrated Safety, Leadership & Applied Skills-IV-Lab**	8	0	0	16	50	150	200
Total		**30**	**9**	**3**	**36**	**230**	**520**	**750**

Semester-05								
Course Code	**Course Title**	**Credits**	**L**	**T**	**P**	**Internal Marks**	**End Semester Exam Marks**	**Total Marks**
BVSIC501	Advanced Construction Safety Management	4	3	1	0	30	70	100
BVSIC502	Behaviour Based Safety & Human Factors	4	3	1	0	30	70	100
BVSIC503	Legal Compliance, Documentation & Reporting	4	3	1	0	30	70	100
BVSIC504P	Behaviour Based Safety-Lab	2	0	0	4	20	30	50
BVSIC505P	Legal & Compliance Documentation-Lab	2	0	0	4	20	30	50
BVSIC506P	Safety Management System-Lab	6	0	0	12	50	100	150
BVSIC507P	**Industry Internship / Field Training**	8	0	0	16	50	150	200
Total		**30**	**9**	**3**	**36**	**230**	**520**	**750**

Semester-06								
Course Code	**Course Title**	**Credits**	**L**	**T**	**P**	**Internal Marks**	**End Semester Exam Marks**	**Total Marks**
BVSIC601	Emerging Trends in Construction Safety	4	3	1	0	30	70	100
BVSIC602	Project Safety Planning & Execution	4	3	1	0	30	70	100
BVSIC603	Entrepreneurship & Professional Ethics	4	3	1	0	30	70	100
BVSIC604P	Project Safety Planning-Lab	2	0	0	4	20	30	50
BVSIC605P	Entrepreneurship & Professional Ethics-Lab	2	0	0	4	20	30	50
BVSIC606P	Emerging Trends in Construction Safety-Lab	6	0	0	12	50	100	150
BVSIC607P	**Major Project / Dissertation**	8	0	0	16	50	150	200
Total		**30**	**9**	**3**	**36**	**230**	**520**	**750**

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SEMESTER-01

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CONSTRUCTION FUNDAMENTALS & SAFETY INDUCTION

BVSIC101

Unit 1: **06**

Orientation & Construction Industry Overview:

- Introduction to the construction industry in India
- Overview of the TPL ecosystem and project environment
- Role and responsibilities of Suraksha Nayak
- Career opportunities for safety professionals in the construction sector
- Importance of safety culture in construction projects
- Professional ethics and workplace discipline
- Importance of teamwork and communication at construction sites

Unit 2: **06**

Safety Culture & Behaviour-Based Safety:

- Concept and importance of safety culture
- Behaviour-Based Safety (BBS) principles
- Safe and unsafe acts at construction sites
- Reporting unsafe conditions and unsafe acts
- Role of supervisors and workers in maintaining safety
- Worker participation in safety programs
- Safety awareness, motivation, and communication practices

Unit 3: **06**

Fundamentals of Construction Safety:

- Principles of Safety, Health, and Environment (SHE)
- Introduction to OSHE terminology and concepts
- Personal Protective Equipment (PPE): types, uses, and maintenance
- Hazard identification and basic risk assessment
- Accident causation theories and prevention strategies
- Introduction to Emergency Response Systems
- Understanding EHS Plans and their implementation
- Case studies on construction accidents and key learning points

Unit 4: **06**

Occupational Health, Ergonomics & Workplace Hazards:

- Occupational health and worker well-being
- Medical surveillance and health monitoring at construction sites
- Ergonomics and prevention of work-related injuries
- Exposure to workplace hazards such as dust, noise, and chemicals
- Control measures for occupational health hazards
- Importance of worker wellness and fatigue management

Unit 5: **06**

Construction Site Familiarization & Basic Safety Practices:

- Construction site layout and workflow
- Key departments and their functions at construction sites
- Common construction trades and work operations
- Material handling safety practices
- Basics of electrical safety at construction sites
- Fire safety fundamentals and fire prevention
- Coordination of HSE with other departments and site functions

References:

- K.N. Vaid, Construction Safety Management
- V.J. Davies and K.Tomasin, Construction Safety Handbook
- James B.Fullman, Construction Safety, Security & Loss Prevention

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HAZARD CONTROL & EMERGENCY PREPAREDNESS

BVSIC102

Unit 1: **06**

Hazard Identification & Workplace Hazards:

- Introduction to workplace hazards in construction
- Types of hazards: physical, chemical, mechanical, ergonomic, and environmental
- Methods for identifying hazards at construction sites
- Hazard communication systems (signages, symbols, labels)
- Recognizing unsafe acts and unsafe conditions
- Importance of hazard reporting systems

Unit 2: **06**

Risk Assessment & Safety Analysis Techniques:

- Basics of risk assessment in construction activities
- Hazard Identification and Risk Assessment (HIRA)
- Job Safety Analysis (JSA) and its application at worksites
- Hazard and Operability Analysis (HAZOP)
- Fault Tree Analysis (FTA)
- Event Tree Analysis (ETA)
- Failure Mode and Effect Analysis (FMEA)
- Understanding hazard severity, risk rating, and control measures

Unit 3: **06**

Incident Reporting & Safety Performance Monitoring:

- Incident and accident reporting procedures
- Near-miss reporting and documentation formats
- Investigation of incidents and identification of root causes
- Corrective and preventive actions
- Understanding Lost Time Injury (LTI) and safety indicators
- Safe man-hours concept and monitoring safety performance
- Importance of mock drills and safety preparedness

Unit 4: **06**

Emergency Response & First Aid:

- Emergency Response Plan and emergency response team structure
- Emergency rescue equipment and tools
- Emergency communication systems and reporting channels
- Fire safety: types of fires and fire extinguisher usage (practical demonstration)
- Emergency evacuation procedures at construction sites

- **First-aid fundamentals:**
  - CPR (Cardio Pulmonary Resuscitation)
  - Bleeding control
  - Fracture handling
  - Basic life support

Unit 5: **06**

Environmental Protection & Waste Management:

- Environmental impact of construction activities
- Identification of environmental pollution sources
- Basic Environmental Impact Assessment (EIA) concepts
- Waste management practices at construction sites
- R3 concept: Reduce, Reuse, Recycle
- Sustainable construction practices and environmental protection measures

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SAFETY COMPLIANCE & REGULATORY STANDARDS –I
BVSIC103

Unit 1: **06**

Overview of Labour Laws in India (Construction Sector Context):

- Evolution and objectives of labour laws in India
- Fundamental rights and constitutional provisions related to labour welfare
- Need for labour regulation in the construction industry
- Nature of construction workforce – informal labour and migrant workers
- Occupational risks and vulnerabilities in construction work

Unit 2: **06**

Key Labour Codes & Employment Standards:

- Code on Wages, 2019 – minimum wages, payment of wages and bonus provisions
- Equal remuneration and non-discrimination principles
- Occupational Safety, Health & Working Conditions Code (OSHWC), 2020
- Employer responsibilities for workplace safety and worker welfare
- Working hours, overtime regulations and leave provisions
- Provisions related to women workers and night shift regulations

Unit 3: **06**

Construction Industry Specific Acts:

- Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996
- Scope and applicability of the BOCW Act
- Registration of establishments and workers
- Duties and responsibilities of employers and contractors
- Role of BOCW Welfare Boards and worker benefits

Unit 4: **06**

Welfare Cess & Contract Labour Regulation:

- BOCW Welfare Cess Act, 1996 and its purpose
- Cess calculation (1–2% of construction cost)
- Filing returns and compliance requirements
- Contract Labour (Regulation and Abolition) Act, 1970
- Registration of principal employers and licensing of contractors
- Welfare provisions and responsibilities towards contract labour

Unit 5: **06**

Safety, Health & Environmental Regulatory Framework:

- National Building Code (NBC) safety provisions for construction activities
- Fire safety and structural safety guidelines
- Safety requirements for scaffolding, formwork and lifting appliances
- Health and safety duties under OSHWC Code
- Site safety plans, training and first aid requirements
- CPWD and State PWD safety provisions (Clause 19K – training and certification)
- Construction & Demolition Waste Management Rules, 2016
- Pollution control measures – dust, noise and water management

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CONSTRUCTION FUNDAMENTALS & SAFETY INDUCTION –LAB BVSIC104P

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HAZARD CONTROL & EMERGENCY PREPAREDNESS- LAB
BVSIC105P

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SAFETY COMPLIANCE & REGULATORY STANDARDS -I- LAB
BVSIC106P

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INTEGRATED SAFETY, LEADERSHIP & APPLIED SKILLS -I-LAB BVSIC107P

Unit 1:
Site Office & Documentation Skills:

- Daily logbooks & checklist filling,
- Toolbox talk preparation and delivery,
- Visitor & induction safety briefing,
- Basic computer skills & email communication.

Unit 2:
Specialized Topics & Administrative:

- Demolition work-specific risks and safety protocols required before & during demolition.
- Confined space-Training,
- Permit to work systems, gas testing & rescue procedures for confined spaces, lagging and leading indicators,
- Method statements and SOP.

Unit 3:
Leadership, team work, BBS, Coordination & Communication:

- **Health, Physical Education & Human Values –I & Soft Skills:-** English Fluency Development –I, Building Self Confidence –I, Communication Skills –I, Attitude Building –I, Presentation Skills –I, Human Values –I

Unit 4:
Practical Exposure & Project Work:

- Weekly supervised site safety rounds,
- Participation in toolbox talks,
- Preparing incident & observation reports,
- Practical
- Practical Viva & Project & Presentation.

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SEMESTER-02

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ADVANCE CONSTRUCTION HAZARD & RISK MANAGEMENT BVSIC201

Unit 1: **06**

Advanced Construction Hazard Management:

- Hazards associated with construction activities
- Scaffold and formwork safety requirements
- Working at heights and fall prevention systems
- Confined space safety management and entry procedures
- Lifting operations and crane safety practices
- Excavation, trenching and earthwork safety measures

Unit 2: **06**

Risk Identification & Assessment Techniques:

- Hazard Identification and Risk Assessment (HIRA) process
- Identification of hazards in construction operations
- Risk evaluation and risk rating methods
- Control measures for high-risk construction activities
- Documentation and reporting of risk assessments

Unit 3: **06**

Safety Planning & Permit-to-Work Systems:

- Preparation of safety plans for construction projects
- Method statements for safe execution of work
- Permit-to-work system and its importance
- Types of permits (hot work, confined space, electrical, height work)
- Responsibilities of supervisors and safety personnel in permit control

Unit 4: **06**

Incident Investigation & Root Cause Analysis:

- Types of construction incidents and accidents
- Incident reporting procedures
- Root cause analysis techniques for accidents
- Corrective and preventive actions
- Learning from past incidents and case studies

Unit 5: **06**

Safety Monitoring, Inspection & Audit:

- Safety inspection techniques at construction sites
- Safety audit procedures and checklist preparation
- Monitoring compliance with safety standards
- Reporting and documentation of safety observations
- Continuous improvement in construction safety management

References:

- Factories Act, 1948 with amendments of 1976 & 1987
- Fundamentals of Industrial Hygiene by Barbara A. Plog & particia J. Quinlan
- Safety at work by John rid by & John Channing
- Occupational Health & Safety in manufacturing Industries M K Potty
- Carl Goodson, “Essentials of fire fighting” Fire protection publications; 5th edition
- Practical Handbook on Building Construction. By Er. M.K.Gupta. (Nabhi Publication)

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FIRE & DISASTER MANAGEMENT
BVSIC202

Unit 1: **06**

Fundamentals of Fire & Disaster Management:

- Basic concepts of fire and disaster management
- Fire triangle and fire behavior
- Types and causes of fires at construction sites
- Classification of fires (Class A, B, C, D, K)
- Fire prevention measures at construction projects
- Role of safety personnel during fire emergencies

Unit 2: **06**

Fire Safety Systems & Fire Protection Equipment:

- Advanced fire safety systems in buildings and construction sites
- Fire detection and alarm systems
- Types of fire extinguishers and their applications
- Fire suppression systems (sprinklers, hydrants, hose reels)
- Inspection and maintenance of fire protection systems
- Safe storage and handling of flammable materials

Unit 3: **06**

Disaster & Crisis Management Planning:

- Types of disasters affecting construction projects (natural and man-made)
- Disaster risk assessment and mitigation strategies
- Disaster management planning and preparedness
- Roles and responsibilities of emergency response teams
- Coordination with local emergency authorities

Unit 4: **06**

Emergency Response & Evacuation Procedures:

- Emergency response systems at construction sites
- Emergency communication systems and reporting procedures
- Evacuation planning and assembly points
- Crowd control and worker safety during emergencies
- Role of safety officers during emergency situations

Unit 5: **06**

Fire Drills & Emergency Simulation Exercises:

- Importance of mock drills and emergency preparedness
- Planning and conducting fire drills
- Emergency simulation exercises at construction sites
- Evaluation and improvement after mock drills
- Training and awareness programs for workers on fire safety

References:

- Practrical Handbook on Building construction Er. M.k. Gupta (NAbhi Publication)
- Sushil Kumar; Building Construction
- B.C. Punmia; Building Construction
- Gurucharan Singh & Jagdish Singh Building Planning, Design and Scheduling
- Malik & Meo; Building Design and Drawing
- Building Construction, Metchell

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SAFETY COMPLIANCE & REGULATORY STANDARDS –II
BVSIC203

Unit 1: **06**

Construction Safety Legislation & Standards:

- Overview of construction safety legislation in India
- Construction-related provisions under safety laws
- Building and construction workers safety rules and guidelines
- Roles and responsibilities of clients, contractors, supervisors, and workers
- National standards and codes applicable to construction safety
- Legal compliance, liabilities, and penalties in construction projects

Unit 2: **06**

Hazard Identification & Risk Assessment in Construction:

- Common construction site hazards (work at height, excavation, lifting operations, electrical work)
- Hazard Identification and Risk Assessment (HIRA) process
- Job Safety Analysis (JSA) for construction activities
- Risk evaluation and risk rating techniques
- Implementation of the hierarchy of controls in construction safety

Unit 3: **06**

Permit-to-Work Systems & Safety Procedures:

- Importance of permit-to-work systems in construction safety
- Types of permits (hot work, confined space, height work, electrical work)
- Responsibilities of supervisors and safety officers in permit control
- Safe work procedures and method statements
- Coordination between different work teams during high-risk activities

Unit 4: **06**

Safety Management, Audits & Compliance Monitoring:

- Construction safety management systems
- Site safety inspections and safety audit procedures
- Toolbox talks and safety meetings at construction sites
- Safety documentation: safety plans, method statements, checklists
- Monitoring compliance with safety standards and regulations

Unit 5: **06**

Accident Prevention, Emergency Preparedness & Continuous Improvement:

- Common construction accidents and prevention strategies
- Accident and incident investigation techniques
- Emergency preparedness (fire, structural collapse, electrical shock, rescue at height)
- Reporting and record keeping in construction safety
- Continuous improvement and promotion of safety culture in construction industry

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ADVANCE CONSTRUCTION HAZARD & RISK MANAGEMENT-LAB BVSIC204P

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FIRE & DISASTER MANAGEMENT-LAB
BVSIC205P

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SAFETY COMPLIANCE & REGULATORY STANDARDS-II-LAB
BVSIC206P

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INTEGRATED SAFETY, LEADERSHIP & APPLIED SKILLS-II-LAB BVSIC207P

Unit 1:
Site Documentation & Digital Skills:

- Preparation of daily safety inspection reports
- Incident / Near-miss reporting formats
- Maintaining safety registers and documentation
- Basic MS Word, Excel for safety records
- Email drafting for site communication and reporting

Unit 2:
Specialized Safety Practices:

- Fire safety training and emergency response
- Fire prevention measures at construction sites
- Use of fire extinguishers and firefighting equipment
- Emergency evacuation planning
- Disaster preparedness and mock drills

Unit 3:
Leadership, Teamwork & Communication Skills:

- Health, Physical Education & Human Values – II
- English Fluency Development – II
- Confidence building and public speaking
- Conflict management and teamwork
- Leadership roles of safety supervisors

Unit 4:
Practical Exposure & Field Work:

- Assisting in site safety inspections
- Participation in emergency mock drills
- Preparing hazard identification reports
- Practical demonstration of fire safety equipment
- Practical viva, project report & presentation

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SEMESTER-03

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CONSTRUCTION EQUIPMENT SAFETY & MAINTENANCE
BVSIC301

Unit 1: **06**

Introduction to Construction Equipment, Hazard Identification & Selection:

- Overview of commonly used construction equipment
- Identification of equipment-related hazards at construction sites
- Analysis of accident statistics and common causes
- Risk factors associated with improper equipment use
- Criteria for selecting suitable equipment based on site conditions

Unit 2: **06**

Earthmoving equipment safety – excavators, loaders, dozers, cranes:

- Safety aspects of excavators, loaders, dozers, and cranes
- Operating hazards during digging, lifting, and hauling
- Stability, overturning, and collision risks
- Safe operating procedures and exclusion zones
- Role of trained operators and supervisors

Unit 3: **06**

Equipment inspection, preventive & predictive maintenance, checklists:

- Importance of regular equipment inspection
- Pre-start, routine, and shutdown inspection practices
- Preventive and predictive maintenance concepts
- Use of checklists and maintenance records
- Early detection of defects to prevent accidents

Unit 4: **06**

Operator safety, signaling, ergonomics, fatigue management:

- Roles and responsibilities of equipment operators
- Standard hand signals and communication methods
- Ergonomic design of operator cabins and controls
- Fatigue, stress, and their impact on safety
- Measures to improve alertness and reduce operator errors

Unit 5: **06**

Equipment failure case studies, safety audits, statutory requirements:

- Analysis of equipment failure incidents and case studies
- Root cause analysis of accidents
- Equipment safety audits and inspection procedures
- Statutory requirements and legal obligations
- Compliance with safety standards and documentation

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OCCUPATIONAL HEALTH & INDUSTRIAL HYGIENE BVSIC302

Unit 1: **06**

Occupational health principles, industrial diseases, epidemiology:

- Concept and objectives of occupational health
- Relationship between work environment and worker health
- Common industrial and occupational diseases
- Basics of epidemiology in occupational health
- Prevention and control of work-related illnesses

Unit 2: **06**

Physical hazards – noise, vibration, heat, radiation:

- Types of physical hazards at workplaces
- Noise exposure and hearing loss
- Effects of vibration on the human body
- Heat stress, cold stress, and thermal comfort
- Radiation hazards and control measures

Unit 3: **06**

Chemical & biological hazards, exposure limits, MSDS:

- **T**ypes of chemical and biological agents
- Routes of exposure and health effects
- Occupational exposure limits (OELs)
- Material Safety Data Sheets (MSDS) and labeling
- Control measures and safe handling practices

Unit 4: **06**

Ergonomics, work physiology, stress management:

- Principles and importance of ergonomics
- Human body mechanics and work physiology
- Musculoskeletal disorders and prevention
- Occupational stress, fatigue, and burnout
- Stress management techniques and workplace wellness

Unit 5: **06**

Health surveillance, monitoring techniques, case studies:

- Importance of health surveillance programs
- Pre-employment and periodic medical examinations
- Workplace health monitoring methods
- Record keeping and data analysis
- Case studies on occupational health management

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ELECTRICAL & MECHANICAL SAFETY
BVSIC303

Unit 1: **06**

Basics of electrical systems, hazards & effects:

- Introduction to electrical systems used in construction sites
- Basic concepts of voltage, current, resistance, and circuits
- Common electrical hazards such as shock, burns, and arc flash
- Effects of electricity on the human body
- Causes of electrical accidents at workplace

Unit 2: **06**

Electrical accidents, earthing, grounding, insulation:

- Types and causes of electrical accidents
- Importance of earthing and grounding systems
- Methods of earthing and grounding
- Role of insulation in electrical safety
- Preventive measures and safe electrical practice

Unit 3: **06**

Mechanical hazards, machine guarding principles:

- Types of mechanical hazards (cutting, crushing, entanglement)
- Moving and rotating machinery hazards
- Principles of machine guarding
- Types of guards and safety devices
- Maintenance and inspection of machine guards

Unit 4: **06**

Lock-out/Tag-out (LOTO), permit systems:

- Concept and importance of LOTO systems
- Steps involved in lock-out and tag-out procedures
- Types of hazardous energy sources
- Permit-to-work systems and their application
- Roles and responsibilities of authorized personnel

Unit 5: **06**

Safety inspections, accident investigation:

- Purpose and types of safety inspections
- Inspection planning and reporting methods
- Accident investigation procedures
- Root cause analysis techniques
- Corrective and preventive actions

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CONSTRUCTION EQUIPMENT SAFETY & MAINTENANCE-LAB BVSIC304P

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OCCUPATIONAL HEALTH & INDUSTRIAL HYGIENE-LAB BVSIC305P

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ELECTRICAL & MECHANICAL SAFETY-LAB
BVSIC306P

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INTEGRATED SAFETY, LEADERSHIP & APPLIED SKILLS-III-LAB BVSIC307P

Unit 1:
Advanced Site Documentation & Reporting:

- Preparation of safety audit reports
- Documentation for risk assessment and JSA
- Preparing permit-to-work documentation
- Safety statistics and data recording
- Digital documentation and reporting tools

Unit 2:
Specialized Construction Safety Topics:

- Working at height safety procedures
- Scaffolding inspection and safety checks
- Lifting operations and crane safety
- Electrical safety practices at construction sites
- Personal protective equipment (PPE) inspection

Unit 3:
Leadership Development & Professional Skills:

- Health, Physical Education & Human Values – III
- English Fluency Development – III
- Negotiation and interpersonal skills
- Safety leadership and team coordination
- Workplace ethics and professional conduct

Unit 4:
Practical Exposure & Applied Learning:

- Conducting site hazard identification exercises
- Participation in safety committee meetings
- Preparing toolbox talk presentations
- Case study analysis of construction accidents
- Practical viva, project work & presentation

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SEMESTER-04

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WORKING AT HEIGHT & CONFINED SPACE SAFETY
BVSIC401

Unit 1: **06**

Work-at-height regulations, fall hazards:

- Definition and scope of work at height
- Legal provisions and safety regulations
- Types of fall hazards in construction
- Causes of falls and common unsafe practices
- Fall prevention and protection methods

Unit 2: **06**

Scaffolding, ladders, platforms safety:

- Types of scaffolding and access systems
- Safety requirements for ladders and platforms
- Erection, use, and dismantling procedures
- Load capacity and stability considerations
- Inspection and maintenance of access equipment

Unit 3: **06**

Confined space hazards, gas testing:

- Definition and classification of confined spaces
- Atmospheric hazards: oxygen deficiency, toxic and flammable gases
- Gas testing instruments and procedures
- Entry permits and safety precautions
- Ventilation and emergency preparedness

Unit 4: **06**

Rescue procedures, PPE & safety devices:

- Emergency response and rescue planning
- Rescue techniques for work-at-height and confined spaces
- Selection and use of personal protective equipment (PPE)
- Safety devices such as lifelines, harnesses, and anchor points
- Training and competency requirements

Unit 5: **06**

Case studies, compliance & audits:

- Review of real-life accident case studies
- Lessons learned from major incidents
- Compliance with statutory and company safety standards
- Safety audits and inspection procedures
- Continuous improvement through corrective actions

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ENVIRONMENTAL SAFETY & SUSTAINABILITY
BVSIC402

Unit 1: **06**

Environmental laws & EIA basics:

- Introduction to environmental protection and sustainability
- Overview of major environmental laws and regulations
- Concept and objectives of Environmental Impact Assessment (EIA)
- Stages of EIA process in construction projects
- Role of EIA in environmental clearance and compliance

Unit 2: **06**

Air, water & noise pollution control:

- Sources of air, water, and noise pollution in construction
- Health and environmental impacts of pollution
- Air pollution control measures and dust suppression techniques
- Water pollution prevention and wastewater management
- Noise control methods and permissible limits

Unit 3: **06**

Construction waste management:

- Types of construction and demolition waste
- Waste generation, segregation, and storage
- Reuse, recycling, and disposal methods
- Legal requirements for waste management
- Best practices for waste minimization at construction sites

Unit 4: **06**

Sustainable construction practices:

- Principles of sustainable and green construction
- Energy-efficient materials and construction techniques
- Water conservation and rainwater harvesting
- Use of renewable resources and eco-friendly materials
- Life-cycle approach in construction projects

Unit 5: **06**

Environmental audits & reporting:

- Purpose and importance of environmental audits
- Types of environmental audits
- Audit procedures and documentation
- Environmental monitoring and reporting formats
- Corrective actions and continual improvement

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CONSTRUCTION QUALITY & SAFETY INTEGRATION BVSIC403

Unit 1: **06**

Quality concepts & safety linkage:

- Basic concepts of quality in construction
- Importance of quality in preventing accidents
- Relationship between quality, safety, and productivity
- Cost of poor quality and unsafe practices
- Role of management in quality–safety integration

Unit 2: **06**

Inspection & testing procedures:

- Purpose and types of inspections in construction
- Inspection and test plans (ITP)
- Material testing and workmanship checks
- In-process and final inspections
- Documentation and reporting of inspection results

Unit 3: **06**

Non-conformance & corrective actions:

- Identification of non-conforming work
- Causes of non-conformance in construction
- Non-conformance reports (NCR)
- Corrective and preventive action procedures
- Monitoring effectiveness of corrective actions

Unit 4: **06**

ISO standards & documentation:

- Overview of ISO standards (ISO 9001, ISO 14001, ISO 45001)
- Quality, environmental, and safety documentation
- Document control and record management
- Internal audits and management review
- Compliance and certification requirements

Unit 5: **06**

Integrated management systems:

- Concept of Integrated Management Systems (IMS)
- Integration of quality, safety, and environment systems
- Benefits of IMS in construction projects
- Implementation challenges and solutions
- Continuous improvement through integrated audits

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WORKING AT HEIGHT & CONFINED SPACE SAFETY-LAB
BVSIC404P

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ENVIRONMENTAL SAFETY & SUSTAINABILITY-LAB BVSIC405P

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CONSTRUCTION QUALITY & SAFETY INTEGRATION-LAB BVSIC406P

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INTEGRATED SAFETY, LEADERSHIP & APPLIED SKILLS-IV-LAB BVSIC407P

Unit 1:
Safety Management & Documentation:

- Preparation of site safety management plans
- Safety audit checklist preparation
- Accident investigation documentation
- Maintaining statutory compliance records
- Preparation of safety reports and presentations

Unit 2:
Specialized Safety Operations:

- Confined space entry supervision
- Rescue and emergency response planning
- Environmental safety practices at site
- Waste management and pollution control measures
- Integration of safety with construction quality practices

Unit 3:
Leadership, Professional Development & Soft Skills:

- Health, Physical Education & Human Values – IV
- English Fluency Development – IV
- Advanced communication and presentation skills
- Leadership in crisis and emergency situations
- Decision making and problem-solving skills

Unit 4:
Field Training & Applied Project:

- Conducting complete safety audits of construction sites
- Preparing risk assessment reports
- Leading toolbox talks under supervision
- Industry interaction / guest lectures
- Final practical viva, project report & presentation

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SEMESTER-05

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ADVANCED CONSTRUCTION SAFETY MANAGEMENT BVSIC501

Unit 1: **06**

Safety management systems & leadership:

- Concept and importance of Safety Management Systems (SMS)
- Role of leadership in creating a safety culture
- Management commitment and worker participation
- Safety policies, objectives, and responsibilities

Unit 2: **06**

Risk assessment & hazard analysis:

- Identification of workplace hazards
- Risk assessment methods (HIRA, JSA, etc.)
- Risk evaluation and prioritization
- Control measures: elimination, substitution, engineering & administrative controls

Unit 3: **06**

Safety performance indicators:

- Leading and lagging safety indicators
- Measurement of safety performance
- Accident frequency and severity rates
- Use of KPIs for safety improvement

Unit 4: **06**

Contractor safety management:

- Contractor selection based on safety criteria
- Safety induction and training for contractors
- Monitoring contractor compliance
- Coordination between principal employer and contractors

Unit 5: **06**

Continuous improvement & audits:

- Concept of continuous improvement
- PDCA (Plan–Do–Check–Act) cycle
- Kaizen principles
- Quality improvement tools
- Process performance measurement
- Corrective and preventive actions (CAPA)
- Types of audits (internal, external, supplier)
- Audit planning and preparation
- Audit execution and reporting
- Audit follow-up and management review

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BEHAVIOUR BASED SAFETY & HUMAN FACTORS BVSIC502

Unit 1: **06**

Human behavior & safety culture:

- Basics of human behavior in the workplace
- Psychological factors affecting safety
- Attitudes, beliefs, and perceptions related to risk
- Concept and importance of safety culture
- Role of organization in shaping safe behavior

Unit 2: **06**

Unsafe acts & conditions:

- Definition and examples of unsafe acts
- Identification of unsafe conditions at site
- Human errors and behavioral causes of accidents
- Relationship between unsafe acts, conditions, and incidents
- Methods to control unsafe practices

Unit 3: **06**

Observation techniques & feedback:

- Purpose of safety observations
- Behavior-based observation techniques
- Recording and analyzing observations
- Positive reinforcement and constructive feedback
- Role of supervisors in observation programs

Unit 4: **06**

Motivation & communication:

- Motivation theories related to safety behavior
- Encouraging safe practices among workers
- Effective safety communication methods
- Toolbox talks and safety meetings
- Overcoming communication barriers at site

Unit 5: **06**

BBS program implementation:

- Concept of Behavior-Based Safety (BBS)
- Steps for implementing BBS program
- Roles and responsibilities in BBS
- Monitoring, measurement, and review
- Benefits and challenges of BBS in construction

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LEGAL COMPLIANCE, DOCUMENTATION& REPORTING BVSIC503

Unit 1: **06**

Labour laws & safety legislation:

- Overview of labour laws in India
- Employer and employee rights & responsibilities
- Factories Act, BOCW Act, OSH Code
- Workplace health, safety and welfare provisions
- Legal duties related to occupational safety

Unit 2: **06**

Statutory registers & records:

- Importance of statutory compliance
- Types of mandatory registers and records
- Attendance, wage, overtime and leave registers
- Accident and muster roll registers
- Maintenance, preservation and inspection of records

Unit 3: **06**

Accident reporting & investigation:

- Definition and classification of workplace accidents
- Reporting procedures under labour laws
- Notifiable accidents and statutory intimation
- Accident investigation techniques
- Root cause analysis and preventive measures

Unit 4: **06**

Compliance audits:

- Concept of labour law and safety audits
- Internal and external compliance audits
- Audit checklists and documentation
- Identification of non-compliance
- Corrective and preventive actions

Unit 5: **06**

Legal case studies:

- Analysis of industrial accident cases
- Employer liability and legal consequences
- Court judgments related to labour and safety laws
- Lessons learned from case studies
- Best practices for legal compliance

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BEHAVIOUR BASED SAFETY-LAB
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LEGAL & COMPLIANCE DOCUMENTATION-LAB
BVSIC505P

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SAFETY MANAGEMENT SYSTEM-LAB
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INDUSTRY INTERNSHIP / FIELD TRAINING
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SEMESTER-06

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EMERGING TRENDS IN CONSTRUCTION SAFETY

BVSIC601

Unit 1: **06**

Digital safety tools & BIM:

- Introduction to digital safety management tools
- Role of Building Information Modeling (BIM) in safety planning
- Hazard identification and risk visualization using BIM
- Digital permits, checklists and reporting systems
- Integration of safety data with project management tools

Unit 2: **06**

Automation & AI in safety:

- Overview of automation in workplace safety
- Use of Artificial Intelligence for hazard prediction
- AI-based surveillance and unsafe act detection
- Robotics and drones for high-risk operations
- Benefits and limitations of AI-driven safety systems

Unit 3: **06**

Smart PPE & monitoring systems:

- Concept of smart Personal Protective Equipment (PPE)
- Wearable devices for worker health monitoring
- Sensors for gas detection, fall detection and fatigue
- Real-time location tracking and alert systems
- Data privacy and ethical considerations

Unit 4: **06**

Global best practices:

- International safety standards (ISO, OSHA, ILO)
- Global safety management systems and benchmarks
- Comparative study of safety practices across countries
- Adoption of global best practices in Indian context
- Case examples of successful safety implementation

Unit 5: **06**

Future challenges & innovations:

- Emerging risks in modern workplaces
- Challenges in adopting digital safety technologies
- Future trends in occupational health and safety
- Sustainable and smart safety solutions
- Role of innovation in zero-accident vision

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PROJECT SAFETY PLANNING & EXECUTION
BVSIC602

Unit 1: **06**

Safety planning concepts:

- Introduction to safety planning in projects
- Objectives and importance of safety planning
- Hazard identification and risk assessment
- Safety policies, procedures and standards
- Integration of safety planning with project execution

Unit 2: **06**

Method statements & permits:

- Concept and purpose of method statements
- Preparation and approval of method statements
- Types of work permits (hot work, confined space, height work, etc.)
- Permit-to-Work system and controls
- Roles and responsibilities in permit management

Unit 3: **06**

Resource planning & coordination:

- Planning of safety manpower and supervision
- Allocation of safety equipment and PPE
- Coordination between contractors, supervisors and workers
- Training and competency requirements
- Communication and coordination mechanisms

Unit 4: **06**

Monitoring & reporting:

- Safety performance monitoring techniques
- Site inspections and safety observations
- Incident, near-miss and accident reporting
- Safety metrics, KPIs and dashboards
- Corrective and preventive action tracking

Unit 5: **06**

Project case studies:

- Analysis of real project safety scenarios
- Safety challenges during project execution
- Lessons learned from incidents and best practices
- Application of safety planning concepts
- Continuous improvement through case studies

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ENTREPRENEURSHIP & PROFESSIONAL ETHICS
BVSIC603

Unit 1: **06**

Entrepreneurship basics:

- Concept and scope of entrepreneurship
- Characteristics of successful entrepreneurs
- Role of entrepreneurship in economic development
- Types of business ventures and startups
- Opportunities in safety and consultancy services

Unit 2: **06**

Safety consultancy practices:

- Introduction to safety consultancy services
- Roles and responsibilities of safety consultants
- Safety audits, inspections and advisory services
- Client interaction and reporting practices
- Legal and professional requirements for consultants

Unit 3: **06**

Professional ethics & responsibility:

- Meaning and importance of professional ethics
- Ethical responsibilities of safety professionals
- Code of conduct and professional integrity
- Conflict of interest and confidentiality
- Social and legal accountability

Unit 4: **06**

Business planning:

- Importance of business planning
- Components of a business plan
- Market analysis and service positioning
- Financial planning and pricing strategies
- Risk management and sustainability

Unit 5: **06**

Ethics case studies:

- Study of ethical dilemmas in professional practice
- Case studies related to safety consultancy
- Analysis of ethical decision-making
- Lessons learned from real situations
- Best practices for ethical compliance

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PROJECT SAFETY PLANNING-LAB
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ENTREPRENEURSHIP & PROFESSIONAL ETHICS-LAB BVSIC605P

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EMERGING TRENDS IN CONSTRUCTION SAFETY-LAB BVSIC606P

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