



चयन अनुभाग
Recruitment Section

भारतीय प्रौद्योगिकी संस्थान भिलाई
जिला-दुर्ग, छत्तीसगढ़-491002
Indian Institute of Technology Bhilai
Dist.- Durg, Chhattisgarh - 491002
Website: www.iitbhillai.ac.in

क्रमांक /No. IITBhillai/Staff Rec./2026/125

दिनांक/Date: 20.08.2026

सूचना /NOTICE

Syllabus for Junior Superintendent (JS), Junior Counsellor (JC), Junior Sports Officer (JSO), Assistant Fire Officer (AFO), Junior Technical Superintendent (JTS) and Junior Engineer (JE) – Civil, Electrical, Mechanical

Advertisement No. IITBhillai/ESTT/Staff Rec./2026/52 Dated: 06.03.2026

All the candidates are expected to study the following syllabus for the post of Junior Superintendent (JS), Junior Counsellor (JC), Junior Sports Officer (JSO), Assistant Fire Officer (AFO), Junior Technical Superintendent (JTS) and Junior Engineer (JE) – Civil, Electrical, Mechanical and prepare accordingly. No separate email intimating the syllabus will be sent to individual candidates by the institute. The institute will not be responsible for non checking/ delay in checking the syllabus by the candidate and claiming for any relaxation in this regard in the future.

Syllabus for Junior Superintendent (JS)

PART A	General Aptitude & Awareness: * English Language: Grammar, Vocabulary, Reading Comprehension, Letter/Notice Writing, Sentence correction, paragraph summaries, Verbal analogy, critical reasoning. Reasoning: Verbal and Non-Verbal Reasoning, Data reasoning. * Numerical Ability: Arithmetic, Data Interpretation, Statistics. * General Knowledge: Indian Polity, History, Economy, Geography, Constitution, social issues, environment, SDG, and Current Affairs. * Logical Reasoning: Relations, reasoning, analogy, Number/Alphabet series.
PART B	Academic Administration with Special Reference to IITs * Act and Statutes of IIT Bhilai, Role and Functions of IIT Council, Board of Governors, Finance Committee, Building & Works Committee and Senate, Study the Websites of IIT Bhilai Departments, Academic programs, Degrees, campus life and student activities. Service Rules * FR & SR, Disciplinary Proceedings, Foreign Service, Deputation & Lien, TA Rules and LTC, Leave Rules, Gratuity and Terminal Benefits, Reservations and Concessions for SC, ST, OBC, PH, etc., All CCS / DoPT Rules, New Pension Scheme Government Acts relevant to Academic Administration * The Right to Information Act, 2005, ICC, POSH Act, Anti-Raging. Rules relevant to Accounts and Audit * GFR 2017, e-Procurement and e-Marketplace (GeM), Salient features and Pay-fixation under 7th CPC, Budgeting and Internal Audits, Income Tax Act with focus on Salary Income, e-TDS Modern technologies in the Academic Management system * Office Automation and ERP implementation in an academic system, Biometric attendance system, e-Office, Digitisation Process (Certificates, old records), Computer knowledge and Information Technology.
PART C	English Writing ability * Essay writing (Or) Comprehension etc.
PART D	Computer Skill Test / Trade Test - on a computer (with MS Office and without internet)

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	* Writing an email/letter on a PC. * Making an MS Excel Worksheet and a graphical representation. * Making a PowerPoint Presentation, 5 to 6 slides.
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Syllabus of Junior Counsellor (JC)

PART A	General Aptitude & Awareness * English Language: Grammar, Vocabulary, Reading Comprehension, Letter/Notice writing. * Reasoning: Verbal and Non-Verbal Reasoning. * Numerical Ability: Arithmetic, Data Interpretation, Statistics. * General Knowledge: Indian Polity, History, Economy, Constitution, and Current Affairs.
PART B	Mental Health and Wellbeing of Students * Understanding Mental Health: Key concepts, importance, and challenges faced by students, Promoting Mental Wellbeing: Strategies for promoting mental health, stress management, and self care techniques. Types of Therapies: Overview of therapies like CBT, mindfulness, and narrative therapy, Self-Concept and Social Context: Understanding self-concept, self-image, self-perception, and their role in mental health, Self-Regulation: Techniques for regulating emotions and behaviours to foster resilience and coping. Resilience and Coping: Strategies to build resilience and the role of social support in mental health. Diagnostic Skills for Early Identification and Management of Mental Health Concerns Early Identification: * Key signs and indicators of common mental health issues in students, Crisis Management: Approaches to handling mental health crises and special cases, Socio-Emotional Development: Understanding adolescent mental health and its impact, Psychological Assessments: Tools and techniques for effective psychological assessments and intervention planning. Psychological Theories, Therapeutic Approaches and Treatments * Techniques in cognitive assessment: Intelligence tests, memory scales, and neuropsychological tests, Personality and diagnostic assessments: Projective tests, personality inventories, and diagnostic clarification tools, Specific assessments for children, disabilities, and special populations, Types of therapy: Psychodynamic, cognitive-behavioural, humanistic, and systemic therapies, Therapeutic techniques for emotional and behavioural disorders, Special conditions: Therapy for children, trauma victims, individuals with chronic mental illness, and addiction, Techniques: Cognitive restructuring, mindfulness, play therapy, family therapy, and group therapy, Approaches to address special cases like suicide, bereavement, and posttraumatic stress. Diagnosis and Intervention of Mental Health Disorders * Mood Disorders: Identification and treatment of depression, bipolar disorder, Anxiety Disorders: Identification and treatment, Sleep and Eating Disorders: Identification and treatment, Neurosis and Somatoform Disorders: Common presentations and management strategies, Substance Use Disorders: Understanding and addressing substance use in students. Emotional and Behavioural Emergencies * Identification: Recognising emotional and behavioural emergencies in students, Response and Handling: Immediate intervention strategies and support ढोगको संस्थािन mechanisms. Planning Sensitisation & Collaboration with Stakeholder * Stakeholder Engagement: Planning outreach programs and collaborations with parents, teachers, and the community, Sensitisation: Raising awareness about mental health issues

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	among stakeholders. Emerging Concerns for Children with Special Circumstances, Mental Health of Special Circumstances * Addressing the mental health needs of children in unique situations (e.g., abuse, trauma), Interventions and Perspectives: Holistic mental health approaches for these children. Outreach Activities and Psycho-Educational Prevention Programs * Prevention Programs: Designing and implementing psycho-educational programs aimed at mental health prevention, Student Outreach: Reaching students with information and resources to support their mental health. Expectations of Students and Structural Support * Peer Support: The role of peer support in the mental health landscape, Rehabilitation Processes: Approaches and interventions for supporting students in recovery, Caregivers: Importance of caregivers in maintaining mental health and wellbeing, Psycho-Social Support: Providing psychological and social support to students facing mental health challenges. Current Trends in Counselling and Psychotherapy * Diversity Issues: Addressing cultural and social diversity in counselling, Trauma Counselling: Specialised approaches for students affected by trauma, Psychotherapy: Exploring contemporary psychotherapy practices and their application in educational settings.
PART C	Trade Test * Case Study Analysis and Counselling Approach * Practical Counselling Skills (Role Play) * Psychology and Mental Health Knowledge * Communication, Empathy and Professional Ethics * Record Keeping, Documentation and Report Writing

Syllabus of Junior Sports Officer (JSO)

PART A	General Awareness & Institutional Knowledge * Current affairs (national & educational sector), General mental ability and reasoning, English comprehension and communication, Basic computer knowledge (MS Office, IT fundamentals), Institutional protocols: campus safety, student management, and administrative hierarchy
PART B	Sports training knowledge (Domain knowledge) * Organic function: Cardiovascular, respiratory function, Measurements of Organic Function, Motor Fitness, Cooper's 12-minute continuous run/ walk test., Tuttle's pulse ratio test, Harward step test and its modification. * Motor Fitness : Oregon motor fitness test, JCR test, Canada fitness test, AAHPER youth fitness test. * Test for strength : Strength, Roger's physical fitness index and suggested changes, Kraus-Weber test * Test for skills : Tests: Volleyball-Brady test, Russel and Lange test, Basketball-Johnson test, Knox test, Soccer-Mc Donald test, Johnson test, Field Hockey-Harbans Singh field hockey test, Badminton - Miller test, Dyer tennis test. * Bio-energetics : Energy for muscular contraction and biochemical changes during muscular, contraction, Heat production, and thermodynamics of muscle contraction. * Neuro-muscular concepts : Neuron and motor unit transmission of nerve impulses, bio-electrical potentials, nerve-to-nerve synapse, neuromuscular junction, and transmission of

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	nerve impulses across it. * Effect of exercise on different functional abilities, Kinensiological analysis of different sports skills and techniques, Friction, spin, Construction of standard track, Construction of different play fields, Training plans, long-term and short-term plans, Periodization (Single, double, and triple). Cyclic process of training. Training session, Development of strength and endurance, Development of flexibility, coordinative abilities, Motivation, aggression, emotion, anxiety, Types of tournaments, conduct of tournament, budgeting, Talent identification in sports.
PART C	Evaluating sports-specific knowledge Fundamental skills of particular games, Development of skills, Strategies and tactics, Psychological training, Relaxation techniques, Kinesiological and biomechanical analysis Injuries and its types, Rehabilitation of injuries, Physiotherapy methods of treatment, To identify potential sportspersons, Rules of particular game, Construction and marking of the playfield, Balanced diet, Diet before, during and after competition, Drugs and doping

Syllabus of Assistant Fire Officer (AFO)

PART A	General Awareness & Institutional Knowledge * Current affairs (national & educational sector), General mental ability and reasoning, English comprehension and communication, Basic computer knowledge (MS Office, IT fundamentals), Institutional protocols: campus safety, student management, administrative hierarchy
PART B	Fire Science & Safety * Chemistry of combustion: fire triangle, ignition temperature, flash point, Classification of fires (A, B, C, D, K types), Fire extinguishment methods: cooling, smothering, starvation, Fire load analysis in laboratories, hostels, and classrooms * Firefighting Equipment & Maintenance : Fire extinguishers: types, operation, care & Maintenance, Hydrants, hoses, and fittings: testing and operation, Pumps & primers: centrifugal pumps, fault finding, Foam-making equipment: types, properties, extinguishment techniques, Ladders and breathing apparatus sets: usage and maintenance * Disaster & Emergency Management : Rescue operations during earthquake, chemical/gas leak, electrical fire, Evacuation planning and drills for students and staff, Disaster risk reduction strategies in educational settings, First aid and emergency medical response * Technical & Regulatory Knowledge : Physics basics: matter, energy, heat transfer, Handling hazardous chemicals in laboratories, Explosion hazards (dust, LPG, gas fires), National Building Code (NBC) provisions for fire safety, Fire safety audit procedures in institutions * Security & Protocols : Crowd control during events and examinations, Coordination with civil authorities during VIP visits, Institutional security audits, intrusion detection, access control, Bharatiya Nyaya Sanhita (BNS), 2023 , Bharatiya Nagarik Suraksha Sanhita (BNSS), 2023 and Bharatiya Sakshya Adhinyam (BSA), 2023 basics relevant to campus safety, National Flag Code and protocol compliance
PART C	Trade Test * Demonstration Drill: firefighting and rescue operations in campus scenarios * Personality Test: leadership, discipline, decision-making, communication skills

Syllabus of Junior Technical Superintendent (JTS)

PART A	General Aptitude & Mathematics: * Arithmetic (percentage, ratio, profit & loss, averages); Algebra and basic equations;
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	Geometry and mensuration; Trigonometry basics; Data interpretation * Logical Reasoning & Aptitude: Number series; Analogies and classifications; Coding-decoding; Logical reasoning and problem solving
PART B	Technical Skills: Section A: Programming and Database: Programming: Basic programming in C, Software Life cycle models, Architecture and design patterns, Troubleshooting & bug fixing, Data Structures: Linked lists, queues, stacks, searching, and sorting techniques, Frontend Technologies: HTML, CSS, JavaScript, JSON, jQuery, Bootstrap, AJAX, React.js Backend Technologies: Node.js/Java/PHP/Python, Websockets (handshake, framing, security, error handling), Tomcat/Apache/Nginx server configuration, REST APIs, Database Fundamentals: ER Modeling, Schema, Tables, Views, Primary and Foreign Keys, Normalization, SQL: Basic SQL queries, including SELECT, INSERT, UPDATE, DELETE, JOIN, GROUP, and Filtering, pattern matching, Stored procedures, Triggers, Functions, and Indexing. [OR] Section B: Server Administration: File System Management: Windows File and Directory Layout – NTFS – FAT - Disk Partitions –Defragmentation – Registry - Linux File and Directory Layout – EXT4– FreeBSD – EXT3 – VFAT –Disk Partitions, Virtualization: Types of Virtualization: Hardware Virtualization - operating system Virtualization - Server Virtualization - Storage Virtualization – Windows Hyper Visors - Virtualization Tools, Load Balancer and Storage Management, Account Management: User and group management in Windows and Linux - related commands - superuser - relevant files, Server Management and Security: Types of servers (Web, File, Database, Mail, Application), Network server configuration -- DNS, DHCP, and NTP, Web server configuration -- Apache, FTP/SFTP server management, Authentication server configuration -- LDAP, email servers configuration, database servers – MySQL, PostgreSQL, Memory Management: Windows Memory Architecture and Management – Linux Memory Architecture and Management, Shell scripting [OR] Section C: Networking: OSI and TCP/IP Protocol Stacks, Transmission Media, Networking devices, Network Topology, VLAN and IP Management, TCP/IP, VPN, Physical Layer: Installation and maintenance of Ethernet, advanced, structured cabling, wireless networking, and fiber optics, Network services: network equipment management, including enterprise-class Wi-Fi access points, multi-gigabit network switches, PoE/Non-PoE devices, etc, Network management and Security: Local Area Network (LAN) management and Internet service management, Firewall configuration, security policies, and access management, Management of Proxy and Internet Server, Windows and Linux-based system administration.

Syllabus of Junior Engineer (JE) - (Civil)

PART A	General Aptitude & Awareness * English Language: Grammar, Vocabulary, Reading Comprehension, Letter/Notice writing. * Reasoning: Verbal and Non-Verbal Reasoning. * Numerical Ability: Arithmetic, Data Interpretation, Statistics. * General Knowledge: Indian Polity, History, Economy, Constitution, and Current Affairs.
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PART B

Technical Knowledge

- * Building Materials: Standard tests, uses, and manufacture of cement (Portland), timber and wood-based products, laminates, bituminous materials, paints, varnishes.
- * Concrete Technology: Properties, Advantages and uses of concrete, cement aggregates, and importance of water quality, water cement ratio, workability, mix design, storage, batching, mixing, placement, compaction, finishing, and curing of concrete, quality control of concrete, repair, and Maintenance of concrete structures
- * Building Construction: types of buildings as per the National Building Code. Building components and their basic requirements. Damp proofing- causes, effects and methods.
- * Plinth: Definition, necessity, Construction. Green Building and Design Features, Energy Audit and Environmental Impact Assessment (EIA), Energy and Energy conservation, Green Building and Rating System.
- * Estimating, Costing and Valuation: estimate, glossary of technical terms, analysis of rates, methods and unit of measurement, Items of work – earthwork, Brickwork (Modular & Traditional bricks), RCC work, Shuttering, Timber work, Painting, Flooring, Plastering, Boundary wall. Valuation – Value and cost, scrap value, salvage value, assessed value, sinking fund, depreciation and obsolescence, methods of valuation.
- * Contracts: Understanding the stakeholders/parties involved in a construction contract; Legal Framework/Contract formation and What Constitutes a Contract - using the framework of the Indian Contract Act 1872; Various types of contracts; Rules of interpreting a contract; Commercial terms; Conditions of a contract; Significant contract clauses and risk analysis of key dispute-prone clauses, with case studies; Dispute resolutions - litigation, arbitration and alternative dispute resolution techniques.
- * Basic Surveying: Overview and Classification of Survey, Chain Surveying, Compass Traverse Survey, Levelling and Contouring, Measurement of Area and Volume, Theodolite Surveying, Tachometric surveying and Curve setting, Total station.
- * Geotechnical Engineering: Grain size distribution curves and their uses, Index and engineering properties of soils, compaction of soils, Site investigation, standard penetration test, shallow and deep foundations, safe bearing capacity of soil, Function and requirements of good foundation, types of foundation, introduction to spread, combined, strap, mat and pile foundation.
- * Transportation Engineering: Highway Engineering – cross-sectional elements, geometric design, types of pavements, pavement materials – aggregates and bitumen, different tests, Design of flexible and rigid pavements – Water Bound Macadam (WBM) and Wet Mix Macadam (WMM), Gravel Road, Bituminous construction, Rigid pavement, pavement maintenance.
- * Environmental Engineering: Quality of water, source of water supply, purification of water, distribution of water, need for sanitation, sewage treatments, Surface water drainage, Solid waste management – types, effects, engineered management system, management of e-waste.
- * Structural Engineering: Theory of structures: Elasticity constants, types of beams – determinate and indeterminate, bending moment and shear force diagrams of simply supported, cantilever, and overhanging beams.
- * RCC Design: RCC beams-flexural strength, shear strength, bond strength, design of singly reinforced and double reinforced beams, cantilever beams T-beam, One way and two way slabs, columns,
- * HVAC: Types of AC System - Air cooled / Water Cooled/ DX / Chilled Water. Types of Air Conditioning Equipment -Unitary, Split System, Package AC, Chilled Water (AHU, FCU & FAHU), and VRV System.

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	* Working knowledge of CPWD procedures/standards and relevant IS Codes
PART C	Trade Test * Estimating, measurement of quantities and costing * Surveying * Construction Materials & Quality Control * Engineering Drawing & AutoCAD * MS Office (Excel, Word) & Official Documentation

Syllabus of Junior Engineer (JE) - (Electrical)

PART A	General Aptitude & Awareness: * English Language: Grammar, Vocabulary, Reading Comprehension, Letter/Notice writing. * Reasoning: Verbal and Non-Verbal Reasoning. * Numerical Ability: Arithmetic, Data Interpretation, Statistics. * General Knowledge: Indian Polity, History, Economy, Constitution, and Current Affairs.
PART B	Technical Knowledge * Basic concepts: Concepts of resistance, inductance, capacitance, and various factors affecting them. Concepts of current, voltage, power, energy, and their units * Measurement and measuring instruments: Measurement of power (1 phase and 3 phase, both active and re-active) and energy, 2 wattmeter method of 3 phase power measurement, Measurement of frequency and phase angle Ammeter and voltmeter (both moving oil and moving iron type), extension of range wattmeter, Multimeters, Megger, Energy meter AC Bridges Use of CRO, Signal Generator, CT, PT and their uses Earth Fault detection * Electrical Machines : (i) DC Machine – Construction, Basic Principles of DC motors and generators, their characteristics, speed control, and starting of DC Motors Method of braking motor, Losses and efficiency of DC Machines (ii) 1 phase and 3 phase transformers – Construction, Principles of operation, equivalent circuit, voltage regulation, OC and SC Tests, Losses and efficiency Effect of voltage, frequency and wave form on losses Parallel operation of 1 phase /3 phase transformers Auto transformers * Generation, Transmission and Distribution – Different types of power stations, Load factor, diversity factor, demand factor, cost of generation, inter-connection of power stations Power factor improvement, various types of tariffs, types of faults, short circuit current for symmetrical faults Switchgears – rating of circuit breakers, Principles of arc extinction by oil and air, HRC Fuses, Protection against earth leakage / over current, etc Buchholtz relay, Merz-Price system of protection of generators & transformers, protection of feeders and bus bars Lightning arresters, various transmission and distribution system, comparison of conductor materials, efficiency of different system Cable – Different type of cables, cable rating and derating factor * Estimation and costing: Estimation of lighting scheme, electric installation of machines, and relevant IE rules, Earthing practices, and IE Rules. * Contracts: Understanding the stakeholders/parties involved in a construction contract; Legal Framework/Contract formation and What Constitutes a Contract - using the framework of the Indian Contract Act 1872; Various types of contracts; Rules of interpreting a contract; Commercial terms; Conditions of a contract; Significant contract clauses and risk analysis of key dispute-prone clauses, with case studies; Dispute resolutions - litigation, arbitration and alternative dispute resolution techniques. * Utilization of Electrical Energy: Illumination, Electric heating, Electric welding, * Electroplating, Electric drives and motors.HVAC: Types of AC System - Air cooled / Water



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	Cooled/ DX / Chilled Water. Types of Air Conditioning Equipment -Unitary, Split System, Package AC, Chilled Water (AHU, FCU & FAHU), and VRV System. * Solid waste management – types, effects, engineered management system. Management of e-waste.
PART C	Trade Test * Practical Wiring & Installation * Fault Diagnosis & Repair * Equipment Operation & Maintenance * Safety & Compliance * Energy Management * Documentation & Estate Office Duties

Syllabus of Junior Engineer (JE) - (Mechanical)

PART A	General Aptitude & Awareness * English Language: Grammar, Vocabulary, Reading Comprehension, Letter/Notice writing. * Reasoning: Verbal and Non-Verbal Reasoning. * Numerical Ability: Arithmetic, Data Interpretation, Statistics. * General Knowledge: Indian Polity, History, Economy, Constitution, and Current Affairs.
PART B	Technical Knowledge * General Engineering * Mechanical Engineering: Theory of Machines and Machine Design, Engineering Mechanics and Strength of Materials, Thermodynamics and Thermal Engineering, Internal Combustion Engines, Refrigeration and Air Conditioning, Fluid Mechanics and Hydraulic Machines, Compressors, Engineering Materials, Manufacturing Processes, Engineering standards and specifications, Engineering drawing interpretation, Maintenance engineering, Industrial safety, Basic workshop practices. * Working knowledge of CPWD procedures/standards and relevant IS Codes
PART C	Trade Test * Estimating, measurement of quantities and costing * Materials & Quality Control * MS Office (Excel, Word) & Official Documentation * Engineering Drawing & AutoCAD

All concerned are hereby advised to keep visiting the institute website regularly for any further updates.



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कुलसचिव/Registrar

भा.प्रौ.सं. भिलाई /IIT Bhilai

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