safer infrastructure, empowered communities, and a new generation of experts dedicated to resilient mountain development. The following sections outline the proposal in detail, including the Centre's aims, scope, implementation plan, resource requirements, and expected impacts on the Himalayan region.

2.0 Aim and Objectives

2.1 HIM-DR³ aims to reduce disaster vulnerability in the Indian Himalayan Region by advancing disaster resilience through integrated efforts in capacity building, engineering-driven research, and policy engagement. The Centre will unify scientific research, education, and outreach to inform evidence-based disaster risk reduction (DRR) across state, national, and international levels—bridging knowledge, practice, and governance. HIM-DR³ aspires to be a **Centre of Excellence** connecting Science & Engineering, policy, and implementation for safer and disaster-resilient Himalayan communities.

2.2 Objectives: To achieve this aim, the HIM-DR3 will pursue the following key objectives, each tailored to the unique disaster challenges of the Himalayan region:

- **Interdisciplinary Research & Knowledge Generation:** The Centre will undertake interdisciplinary research on the causes, patterns, and impacts of emerging disasters in the Indian Himalayan Region, with a strong focus on climate variability and dynamic hazard environments. Priority areas include modelling of landslides, floods, GLOFs, earthquakes, and ground subsidence; analysis of changing rainfall patterns and glacier dynamics; and the identification of emerging risks linked to urban expansion, fragile infrastructure, and ecosystem degradation. Research will emphasize engineering-driven approaches for resilient design and adaptive infrastructure solutions suited to mountainous terrain. In parallel, the Centre will assess the socio-economic and cultural impacts of disasters, including displacement, livelihood disruption, and heritage loss. A comprehensive regional knowledge repository —featuring geospatial hazard data, impact case studies, and predictive analytics—will support informed planning, governance, and risk communication. Through high-impact research, technical publications, and knowledge-sharing platforms, the Centre will function as a critical hub for disaster risk science and resilience innovation in the Himalayas.

- **Education & Human Resource Development:** The Centre will function as a regional nucleus for education and human resource development in disaster risk reduction (DRR), resilience building, and climate change adaptation, with a firm grounding in the mandates of the National Education Policy (NEP) 2020, University Grants Commission (UGC) guidelines, and frameworks established by the National Disaster Management Authority (NDMA) and National Institute of Disaster Management (NIDM). Aligned with NEP 2020, which advocates for holistic, multidisciplinary, and flexible education systems, the Centre will design and deliver a broad portfolio of academic programs that integrate science, engineering, policy, environment, and community engagement. These offerings will span certificate-level to doctoral-level education and will be made accessible both at Himachal Pradesh University and through its network of affiliated colleges, covering undergraduate (UG), postgraduate (PG), postgraduate diploma (PGD), and research levels.

The proposed academic programs may include:

Undergraduate Level:

- Foundation Course in Disaster Risk Reduction and Climate Resilience
- B.A./B.Sc. Minor in Disaster Management or Environmental Risk Studies (as per NEP's major/minor model)
- Integrated B.Sc.–M.Sc. Program in Environmental Hazards and Risk Analytics

Postgraduate Level:

- MA/M.Sc. in Disaster Risk Reduction and Disaster Management
- M.Sc. in Disaster Risk Reduction and Climate Adaptation
- M.Tech. in Disaster Mitigation and Resilient Infrastructure Design
- M.A. in Disaster Management and Humanitarian Response
- M.Sc. in Environmental Hazards and Mountain Risk Systems
- Postgraduate Diplomas and Certificate Programs (for Professionals and Students):

- PG Diploma in Disaster Risk Reduction and Resilience Management
- PG Diploma in Mountain Hazards and Emergency Planning
- PG Diploma in Disaster and Development Studies
- Certificate in Landslide Risk Management
- Certificate in Seismic Risk Assessment and Retrofitting
- Certificate in Forest Fire Management and Early Warning Systems
- Certificate in Climate Change Adaptation Practices

Doctoral (Ph.D.) Programs:

Ph.D. in multidisciplinary fields related Disaster Risk Reduction, Resilience and Management & Policy (Social Sciences, Physical Sciences, Engineering Sciences, Environmental and Sustainable Studies, Management etc.)

These programs will be designed in close collaboration with NIDM, drawing on model curricula already developed in consultation with UGC. For instance, NIDM, in partnership with UGC, has already developed a model course curriculum on DRR and Management that includes foundation courses, certificate modules, and PG diploma programs tailored for higher education institutions.

The Centre will also take inspiration from existing national academic models, including:

- IGNOU's PG Diploma in Disaster Risk Reduction and Management (PGDDRRM)
- TISS's M.A. in Disaster Management
- IIT Roorkee's M.Tech. in Disaster Mitigation and Management
- University of Kashmir's M.Sc. in Disaster Management
- JNU's Centre for Disaster Research's Ph.D. Program in Disaster Studies
- Postgraduate Diploma in Disaster Management

The Centre's offerings will prioritize transdisciplinary content, experiential learning,

and field-based components to align with NEP 2020's outcome-based and applied learning focus. Courses will include internships, project work, and collaborations with state and national agencies such as the Himachal Pradesh SDMA, NDMA, and UNDRR partners.

Importantly, these programs will not be limited to full-time students. The Centre will implement flexible learning modes—including hybrid learning, executive education modules, and continuous professional development formats—to engage working professionals such as engineers, district administrators, disaster response personnel, teachers, and planners.

By introducing this comprehensive academic framework, the Centre will serve as a key contributor to national goals under the Prime Minister's 10-point agenda on DRR (specifically Agenda Point 6 on academic engagement), UGC's mandate to integrate DRR into university education, and SDG 13.3 on climate education and institutional capacity. It will equip the next generation of professionals with the multidisciplinary knowledge and practical competencies required to lead India's transition toward resilient, risk-informed development—especially in the vulnerable Himalayan context.

- **Community Resilience & Outreach:** Work directly with at-risk mountain communities to enhance preparedness and resilience at the grassroots. The Centre will promote community- based disaster risk management (CBDRM) initiatives, public awareness campaigns, school safety and village-level disaster planning. Projects will empower local communities with knowledge, early warning tools, and training—for example, establishing village early warning systems for landslides/floods and training community volunteers in emergency response. Emphasis will be on inclusive strategies that incorporate indigenous knowledge and address socio-economic factors in vulnerability (e.g. gender, livelihoods). This ensures that scientific advancements translate into practical resilience on the ground, achieving "last-mile" risk reduction in remote Himalayan villages.
- **Policy Advisory & Advocacy:** Serve as a **policy think-tank** and technical advisor for disaster risk management and climate change adaptation in the Himalayas. The Centre will provide evidence-based inputs to government policies, plans and projects – for instance, advising state agencies on integrating climate risk into

development planning, improving building codes for hill areas, or designing district disaster management plans. Faculty may contribute to national committees (NDMA, BIS code revisions, etc.) and state advisory bodies. By producing policy briefs, guidelines, and participating in decision-making forums, HIM-DR^3 will bridge the gap between science and policy, ensuring that research findings inform **governance and planning** across the Himalayan region.

- **Technological Innovation in DRR:** Drive the development and deployment of **innovative technologies** for disaster mitigation and climate adaptation suited to the mountainous context. This involves creating low-cost early warning systems (e.g. rainfall thresholds for landslides with sensor networks), developing decision-support software and GIS tools for emergency response, exploring the use of drones and remote sensing for hazard mapping, and promoting safe construction technologies for hill towns. The Centre will foster an innovation ecosystem, collaborating with engineering institutions and industry to pilot new solutions (such as slope monitoring instruments, resilient infrastructure designs, or climate-smart agriculture techniques). By advancing technology for mountain risk reduction, HIM-DR^3 aims to make the Himalayan region a test-bed for innovation in DRR.

  Each of these objectives is **measurable** and will be tracked through specific indicators (e.g. number of research studies published, students graduated, community members trained, policies influenced, and technologies developed/deployed). Collectively, they ensure that the Centre addresses the multifaceted nature of disaster risk and climate challenges in the Himalayas – from science and engineering aspects to social, educational, and policy dimensions.

3.0 Scope of the Centre

The scope of HIM-DR3's activities is broad, encompassing **academic programs, research and innovation, capacity-building, and technical services**, all oriented to the needs of the Himalayan region. The Centre will serve as an interdisciplinary platform that brings together geosciences, climate science, engineering, social sciences, and technology. Key components of the Centre's scope include:

3.1 Capacity-Building Initiatives

Building capacity at multiple levels – from government officials to local communities – is a core mandate. HIM-DR3 will organize regular **training programs and workshops** for stakeholders across the Himalayan region. In partnership with NIDM, NDMA, and state authorities, the Centre will train: state and district disaster management officers, engineers of PWD and rural development departments, planners, police and emergency responders, health officers, and NGO workers. Training modules will cover preparation of Disaster Management Plans, Incident Response System (IRS) protocols, post-disaster needs assessment, landslide and flash-flood management, forest fire prevention, climate-smart development planning, etc. The Centre will also conduct **community-oriented training** -- for example, village emergency response team training, school safety and first aid workshops, and mock drills in landslide/flood-prone villages. Many of these programs will align with national capacity-building schemes (such as NDMA's training programs or State Disaster Management Authority initiatives), thus amplifying their reach. By year 3, the Centre expects to have trained hundreds of officials, local leaders (Panchayati Raj institution members), teachers, and volunteers from across Himachal and other Himalayan states. These efforts will cultivate a culture of preparedness and ensure that knowledge generated in the Centre translates into practical skills on the ground.

To support ongoing capacity building, HIM-DR3 will develop training materials, manuals, and toolkits tailored to mountain areas (e.g. guidelines for retrofitting hill homes, community flood early warning handbook, etc.). It will also establish an **Outreach Unit** that coordinates with local administration for community engagement projects. Through this unit, the Centre will run awareness campaigns (leveraging radio, print, and digital media in local languages) on disaster preparedness and climate change impacts in hill areas. Over time, a network of trained "resilience champions" – including school teachers, village volunteers, and civil defence members – will form across various districts, creating a grassroots support system for DRR. These capacity- building initiatives ensure that the Centre's impact is **not confined to academia** but is felt directly by the communities and government systems in the Himalayan region.

3.2 Geotechnical and Infrastructural Research & Testing Facility (GIRTF) (Details attached as Annexure-F).

A unique feature of HIM-DR3 will be the establishment of the **Geotechnical and Infrastructural Research and Testing Facility (GIRTF)**. This will be a state-of-the-art laboratory complex under the Centre, dedicated to advanced testing and research in geotechnical engineering, structural safety, and material testing relevant to disaster resilience. The GIRTF will significantly enhance HPU's capabilities by providing **accredited testing services** and supporting high-end research across a range of areas:

- **Geotechnical and Rock Mechanics Testing:** Equipment such as triaxial shear apparatus, shake tables, and soil testing instruments will allow analysis of landslide-prone soils, rock stability, and slope failure mechanics under various conditions. This is crucial for understanding landslide triggers in Himalayan geology and designing effective mitigation (slope stabilization, retaining structures, etc.).
- **Construction Materials and Structural Testing:** Facilities to test concrete, steel, timber, and masonry (e.g. strength tests, load-bearing tests) will support earthquake engineering research and safe construction practices for hill architecture. Simulating how local building designs perform under seismic forces will guide retrofitting and improved construction codes for the region.
- **Terrain and Climate Impact Studies:** Specialized setups for simulating hydrological processes (e.g. flume for flash flood or GLOF simulation), and environmental chambers for weathering studies of materials, will enable research on how Himalayan climatic conditions impact infrastructure and slopes.

The **GIRTF** will serve both academic and commercial purposes. It will act as a **certified testing center** for the region, where government departments (PWD, CPWD, BRO), public sector units (hydropower companies like SJVN, road agencies like NHAI, railways, etc.), and private firms can get their construction materials and project site samples tested. Currently, agencies in Himachal often send samples to distant labs; GIRTF will cater to these needs locally by offering standardized, reliable tests and expert analysis. This will not only fill a vital service gap but also generate consultancy revenue for HPU (contributing to the university's corpus fund). Over time, the GIRTF can become financially self-sustaining through testing fees and

consultancy projects, enhancing the Centre's and university's sustainability.

Beyond revenue, **GIRTF strengthens research and innovation**. Its presence will enable HPU to apply for competitive R&D grants (e.g. from DST, Ministry of Earth Sciences, CSIR, etc.), as the facility provides the high-end infrastructure needed for such projects. The facility will directly support HIM-DR3's projects by allowing on-site experiments for hazard analysis, structural forensics after a disaster, and climate impact studies. For example, after a landslide event, Centre researchers can bring samples to GIRTF for testing soil properties and failure analysis; for climate studies, sensors and data can be calibrated against lab simulations. The GIRTF will also be an **educational asset**: students from HPU's engineering programs (B.Tech, M.Tech, Ph.D. in Civil/Geotechnical) and HIM-DR3's own M.Sc./Ph.D. students will use the lab for coursework. Gaining hands-on experience with advanced equipment will greatly enhance student training and produce industry-ready graduates. In summary, GIRTF will function as a multifunctional platform – advancing research, enabling consultancy and testing services for safer infrastructure, attracting funding, and training students – thereby positioning HPU as a leading center for infrastructure and disaster research in the North Indian Himalayas.

In addition to the GIRTF, the Centre will develop several specialized laboratories and facilities to support its thematic divisions:

- A **Geo-hazards Lab** for soil and rock analysis related to landslides (with basic geotechnical testing apparatus and field investigation tools).
- A **Climate and Hydrology Lab** equipped with high-performance computers and simulation software for climate modelling, flood forecasting, and glacier lake monitoring analyses. This lab will host GIS and remote sensing software, climate data tools, and potentially downscaled climate model outputs for the Himalayan region.
- A **GIS & Remote Sensing Lab** with dedicated workstations for spatial data analysis and hazard mapping, plus large-format plotters and GPS devices for field mapping.
- A **Disaster Simulation and Innovation Lab**, which could include virtual reality

simulation setups for disaster scenarios (to train personnel in Emergency Operations Center simulations), electronic workbenches for developing sensor prototypes (using Arduino/Raspberry Pi kits for environmental monitoring), and small-scale physical models like a one-dimensional shake table or a miniature flume for educational demos of earthquake and flood effects.

- A **Field Equipment Pool** comprising portable instruments (drones for aerial surveys, automatic weather stations, rain gauges, river flow gauges, ground vibration sensors, etc.) to be used in field studies and pilot early warning deployments.

- A **Knowledge Resource Center (Library)** housing key literature (books, manuals, research reports, and digital access to journals) on DRR and climate change, as well as a repository of past disaster reports, maps, and data for the Himalayas.

These facilities will be developed in phases (as funding allows) and will collectively ensure that HIM-DR3 has the necessary infrastructure to carry out its academic and research mission effectively. HPU will provide space and utilities, and initial investments will go toward refurbishing and equipping these labs. Over the first three years, for instance, the plan is to set up the basic office, classroom and GIS lab in Year 1, add geotechnical lab equipment in Year 2, and introduce advanced simulators or specialized instruments by Year 3. This phased approach aligns the infrastructure build-up with the Centre's growing activities.

4.0 Academic Programs and Courses

A cornerstone of HIM-DR3's mandate is to **impart high-quality education** in disaster management and climate change adaptation, with a focus on mountain ecosystems. The Centre will launch new academic programs that produce skilled graduates and researchers, thereby addressing the shortage of trained manpower in this field within the Himalayan region. Proposed programs include:

- **Master program (Disaster Management and Climate Resilience)** -- A two-year postgraduate program envisioned as the flagship course of the Centre. This interdisciplinary M.Sc. (which could also be titled M.A. or Master of Disaster Management, depending on university conventions) will admit students from

diverse backgrounds (natural sciences, engineering, social sciences) to create a rich learning cohort. The curriculum, spread over four semesters (~80 credits), will be modeled on best practices from pioneering programs (like JNU's M.A. in Disaster Studies) but **tailored to the Himalayan context.** Core courses in the first year will cover fundamental concepts: Principles of Disaster Risk Reduction, Mountain Geology and Geohazards, Climate Science and Climate Change, Geoinformatics (GIS/Remote Sensing) for DRR, Hydrometeorological Hazards, Emergency Management, and Community-Based DRR. The second year will offer advanced electives grouped by specialization – e.g. *Landslide Risk Engineering, Earthquake-Resilient Design, Public Health in Disasters, Mountain Ecology and Climate Adaptation, Disaster Law and Policy*. Students will also undertake fieldwork (such as case studies of recent disasters in Himalayan regions), internships with agencies like the Himachal Pradesh SDMA, NDMA, or NGOs, and a dissertation project in the final semester. The goal is to produce graduates who are job-ready for roles in government, international agencies (UNDRR, Red Cross, etc.), NGOs, or the private sector, as well as well-prepared for doctoral research. The first cohort (approximately 20–25 students) is targeted for launch in Year 2 of the Centre's establishment, after securing necessary approvals from HPU's Academic Council and UGC.

- **Ph.D. Program (Disaster Management and Climate Change)** – The Centre will offer doctoral research opportunities to drive innovation and deep investigation into Himalayan DRR issues. Ph.D. scholars will conduct original research under faculty supervision on specialized topics such as: landslide early warning system development, climate change impacts on Himalayan agriculture or water resources, seismic vulnerability assessment of hill towns, traditional ecological knowledge in disaster resilience, etc. The Ph.D. program will begin once a core faculty team and basic labs are in place (likely by Year 2 or 3). Admission will follow HPU's doctoral regulations (entrance exam/interview), and the Centre may host Ph.D. scholars under fellowships from UGC, DST, etc., or as project fellows enrolled for a degree file. By integrating Ph.D. scholars into its research projects (a model used by IIT Guwahati's CDMR), the Centre ensures a pipeline of research output and builds long-term research capacity. Over time, the Ph.D. program will

contribute significantly to knowledge generation and will help create the next generation of professors and experts in this domain, including from the Himalayan states themselves.

- **Postgraduate Diploma and Certificate Courses:** To cater to working professionals and officials who may not enroll in a full degree, HIM-DR3 will offer short-term **diploma and certificate programs**. For example, a six-month PG **Diploma in Disaster Preparedness and Climate Adaptation** could be offered via blended learning, or specialized certificate courses of 8–12 weeks on topics like *Landslide Hazard Mapping*, *Mountain Urban Planning & DRR*, *Climate Change Policy for the Himalayas*, or *Disaster Psychosocial Care*. These courses will be designed in consultation with agencies like NIDM and state governments to meet specific capacity gaps (such as training officers in Incident Command Systems or training masons in safer construction). Many of these can be modular, conducted during evenings or weekends, or as intensive summer courses to allow participation of in-service personnelfile-lavtzumlgjsxufelxcymjzfile-lavtzumlgjsxufelxcymjz. By Year 3, the Centre aims to roll out at least 1–2 certificate courses, which will further broaden its impact and generate some revenue.

All academic offerings will emphasize **practical, field-based learning** in addition to classroom theory. Students will participate in field trips to disaster-affected sites (e.g. visiting a recent landslide site in Kinnaur or a flood-affected village), conduct mock drills and simulations, and engage with community organizations as part of their course work file. The Centre will also invite **visiting faculty and experts** from premier institutions (NDMA, NIDM, IITs, international universities) for guest lectures or short courses, ensuring exposure to real-world experience and global best practicesfile-lavtzumlgjsxufelxcymjzfile-lavtzumlgjsxufelxcymjz. Through these academic programs, HIM-DR3 will fill a critical educational void in the Western Himalayas, equipping students with the knowledge and skills to make tangible contributions to disaster resilience in their communities.

5.0 Thematic Divisions of the Centre

Given the wide spectrum of disaster and climate-related issues in the Himalayas, the Centre's work will be organized into **four thematic divisions**. Each division will

focus on a cluster of related topics, enabling depth of expertise while fostering interdisciplinary collaboration on complex problems. The proposed divisions, and their scope, are as follows:

- **Geotechnical and Seismic Hazards Division:** This division addresses geophysical threats prevalent in the Himalayas, notably **earthquakes, landslides, avalanches,** and related geological risks. It will undertake seismic hazard assessments (including microzonation studies for vulnerable towns like Shimla or Kangra), research active faults and historical seismicity, and develop guidelines for earthquake-resistant structures adapted to hill architecture. A major focus is on landslides – mapping landslide-prone slopes using GIS and remote sensing, installing field instruments or sensors on critical slopes for early warning (e.g. rainfall thresholds for landslide triggers), and studying the geological mechanisms of landslides and slope instabilities. Avalanche monitoring and snow hazard management in high-altitude areas (in collaboration with existing institutes like SASE) also falls under this division. Given Himachal's location in Seismic Zones IV/V and the frequent landslides disrupting roads and settlements, this division's work is crucial for reducing geological risk. It aligns with national priorities – for instance, IIT Roorkee's CoEDMM also emphasizes earthquakes and landslides for mountain regions. The division will ensure the Centre contributes to safer infrastructure development (through landslide zoning in land-use plans, retrofitting techniques for old hill buildings, etc.) and improved early warning and mitigation for geohazards.

- **Hydro-Meteorological Hazards and Climate Division:** This division focuses on **weather, water, and climate-related risks,** which are on the rise due to climate change. It covers disasters such as riverine floods, flash floods, cloudbursts, GLOFs (glacial lake outburst floods), **droughts,** and **forest fires** – all in the context of climate variability. Activities include hydrological modeling of river basins to improve flood forecasting and inundation mapping, monitoring of glaciers and glacial lakes in Himachal (in partnership with glaciology institutes) to assess GLOF risks, and climate trend analysis (e.g. how monsoon patterns or extreme rainfall events are changing in the Western Himalayas). An important component is studying **climate change impacts** on natural resources and hazards – for example, how rising temperatures and shifting snowfall are affecting spring water availability

or increasing forest fire incidents. This division will also explore **adaptation strategies** for mountain communities: climate-smart agriculture practices for hill farmers, water conservation techniques like rejuvenation of hill springs, and ecosystem-based approaches such as forest management to reduce wildfire risk. By integrating climate science with disaster risk, this division mirrors the approach of IIT Guwahati's CDMR, which blends climate change research with DRR. Its work will feed into policy (e.g. supporting the State Action Plan on Climate Change, contributing data to the National Mission for Sustaining Himalayan Ecosystems) and community advisories (like heatwave action plans or drought mitigation plans for hill areas).

- **Community Resilience and Disaster Mitigation Division:** This division emphasizes the **social, community, and policy dimensions** of disaster risk. It covers community-based disaster risk reduction (CBDRR), social vulnerability assessments, disaster education and awareness, and disaster risk governance. Projects in this division may include studies on how socio-economic factors (poverty, gender, tribal/indigenous status) influence resilience in mountain communities, and how to strengthen social capital for DRR. The division will pilot community-driven projects such as preparing **village disaster management plans** in selected high-risk panchayats, implementing school safety programs in remote schools, or designing culturally appropriate early warning communication (for example, using local radio or folk media to disseminate warnings). Policy research is another focus – analyzing the effectiveness of existing regulations (like building bylaws for hill towns, slope cut rules, etc.) and providing recommendations, or documenting lessons from past disasters to inform state policy. This division effectively acts as the bridge between the technical work of other divisions and the end-users. For instance, if the geological division develops a landslide sensor network, the community division will ensure local residents are trained on how to respond to warnings and that response plans are in place. Drawing inspiration from JNU's Special Centre for Disaster Research (which integrates social science and policy in disaster studies), this division ensures the Centre's solutions are **people-centric and inclusive**. It will also handle many of the Centre's capacity-building initiatives (in coordination with the separate training unit), making sure

that scientific knowledge is translated into improved preparedness and mitigation practices among Himalayan communities and institutions.

- **Technological Innovations and Infrastructure Safety Division:** Recognizing the growing role of technology in DRR, this division will focus on **engineering solutions and innovation** to enhance disaster resilience of infrastructure. Key areas include safe infrastructure design for the Himalayas (developing or promoting construction techniques for earthquake-resistant buildings on hill slopes, landslide-proof road construction and slope stabilization methods, tunnel safety, etc.), as well as employing modern technology like ICT, IoT, and remote sensing for disaster management. The division might develop or field-test **early warning systems** -- for example, low-cost rain gauges and alarms for flood or landslide warnings in villages, or IoT-based monitoring for critical infrastructure like bridges and steep cuttings along highways. It will maintain a **geomatics/ICT unit** to build GIS-based decision support systems (e.g. real-time hazard mapping dashboards) and use drone imagery for rapid damage assessments post-disaster. Additionally, this division will explore **emerging risks** that accompany modernization – such as urban disasters (fire, building collapses in hill cities), industrial hazards in the hills, or even climate-related technological risks (like dam failures). While Himachal is primarily facing natural hazards, anticipating future risks (e.g. a chemical spill on a highway or a cyber-attack on emergency communication systems) will keep the Centre ahead of the curve. This division ensures HIM-DR3 stays at the forefront of innovation, working closely with engineers, IT specialists, and possibly incubating startups or solutions that can be scaled. By collaborating with technical institutions (like HPU's own University Institute of Technology, or IIT Mandi, etc.), it will push the envelope on **"smart" disaster management solutions** suitable for the challenging Himalayan terrain.

Each thematic division will be led by an expert (Division Head) and staffed by faculty, researchers, and technical personnel specializing in those areas. They will not operate in isolation cross-division collaboration is built into the Centre's approach. For example, a comprehensive landslide risk reduction project might involve all divisions: geologists mapping the hazard, climate scientists studying rainfall triggers, engineers installing sensors and designing protections, and

community experts training locals on evacuation plans. This integrated approach ensures that the Centre's outputs are **holistic solutions** – scientifically sound, technically feasible, and socially acceptable. By covering the full spectrum of geophysical, hydro-climatic, social and technological aspects, the Centre's scope is exhaustive for the region's needs. Ultimately, organizing the Centre into these divisions allows focused progress on each front while fostering synergy towards the shared mission of a safer, more resilient Himalayan region.

6.0 Implementation Plan

Establishing the HIM-DR3 will be carried out in a **phased manner,** ensuring gradual build-up of capacity, infrastructure, and programs. Each phase has specific milestones and activities, as outlined below:

Foundation and Setup

Infrastructure & Facilities: In the first year, the focus will be on setting up the foundational facilities for the Centre. Allocation of physical space for the HIM-DR3 (e.g. offices, a classroom/seminar room, and initial lab space). Basic refurbishment and furnishing of this space will be completed. A Geotechnical and Infrastructural Research and Testing Facility (GIRTF) will be one of the first facilities established **(with details attached as Annexure-A).** A small **library/resource room** will also be created, stocking key reference materials and enabling access to online journals through HPU's subscriptions.

Manpower Hiring

The detail of the manpower (Teaching, Technical and a Ministerial Staff) is as follow:

Teaching Post (Category-A)

Sr.No	Name of the Post & Pay Scale	No. of Post	Qualification	Eligibility
1.	Professor Pay Matrix Academic Level 14- (Rs. 1,44,200-2,18,200)	01 (Civil Engineering)	• B.Tech. in Civil Engineering • M.Tech. in Building Engineering and Disaster Mitigation/Geotechnical Engineering/Environmental/ Structural Engineering or relevant branch • Ph.D. in Building Engineering and Disaster Mitigation/Geotechnical Engineering/Environmental/ Structural Engineering or relevant branch	As per AICTE Norms

2.	Associate Professor Pay Matrix Academic Level 13A- (Rs. 1,31,400-2,17,100)	01 (Geography/Remote Sensing/GIS/ Geology). 01 (Civil Engineering)	• Master's Degree in a relevant subject • Ph.D. Degree in the relevant/allied discipline (Remote Sensing, GIS, Geoinformatics, Geography, Geology, or equivalent field). • B.Tech. in Civil Engineering • M.Tech. in Remote Sensing/GIS/Building Engineering and Disaster Mitigation/Geotechnical Engineering/Environmental/ Structural Engineering or relevant branch • Ph.D. in Building Engineering and Disaster Mitigation/Geotechnical Engineering/Environmental/ Structural Engineering or relevant branch	As per UGC Norms As per AICTE Norms
3.	Assistant Professor Pay Matrix Academic Level 10- (Rs. 57,700 – 1,82,400)	04 (One post in each discipline) i Civil Engineering ii Geology iii Computer Science Engineering/Information Technology iv Geography	• B.Tech./MTech. in Civil Engineering • Master's degree in Geology / Applied Geology / Earth Sciences • B.E./B.Tech. and M.E./M.Tech. in CSE / IT or related branch • Master's degree in Geography / Disaster Studies / Remote Sensing	As per AICTE /UGC Norms

Technical Staff (Category -B)

Post	No. of Posts	Pay Scale	Minimum Qualification
Technical Officer	1	Level 7 (₹44,900–1,42,400)	B.E./B.Tech./M.Tech. in Civil Engineering
Lab Technician	2	Level 5 (₹29,200–92,300)	Diploma in Civil Engineering
Lab Attendant	2	Level 1 (₹18,000–56,900)	10+2 / ITI in relevant field (Civil/Electrical/Mechanical)

The essential non-teaching (ministerial) staff required for the functioning of the Himalayan Centre for Disaster Risk Reduction and Resilience (HIM-DR²) may be deployed from the existing staff by Himachal Pradesh University.

Non-Teaching (Class C & D) Post

Sr. No.	Name of the post	No. of Post
1.	Junior Office Assistant (IT), JOA-IT	1 No.
2.	Peon	1 No.

7.0 Tentative Budget Estimate

The total budget estimated for establishing and running the HIM-DR3 over the initial three-year period (Phase I–III) is **₹9 crore** INR. This budget will cover infrastructure development, laboratory and equipment costs (especially for the GIRTF testing facility), as well as human resources for the Centre. Below is a breakdown of the budget into major components:

Budget Category	**Amount (INR)**
Centre Infrastructure & Facilities (classrooms, basic labs, offices setup, IT infrastructure, furniture)	₹3.0 Crore
Geotechnical & Infrastructural Testing and Research Facility (GIRTF) – Equipment (Hardware) (material testing machines, data acquisition systems, software, sensors, lab instruments, etc.) **(with details attached as Annexure-A)**	₹5.0 Crore
Skill development programs, seminars, conferences, workshops, and training programs	₹0.35 Crore
Manpower	₹0.65 Crore
Total Estimated Budget (Year 1–3)	**₹9.0 Crore**

Notes on the budget: The **Infrastructure** allocation (₹3 Cr) will fund the refurbishment of space at HPU (renovating rooms for offices and classrooms, creating lab spaces with necessary fixtures), purchase of furniture, and procurement of essential IT equipment (computers, servers, networking) and audio-visual equipment for classrooms/seminar hall. It also covers basic laboratory setups like the GIS lab and safety installations (power backup, etc.). The **Testing Facility (₹5 Cr total)** is the largest investment: ₹4 Cr is earmarked for heavy equipment and instruments (for example, universal testing machines, triaxial shear apparatus, shake table, drilling rig

for soil samples, etc.), and ₹1 Cr for software, digital tools, and possibly high-end computing hardware necessary for the labs. We have explicitly separated hardware and software to emphasize that modern research needs both physical and digital infrastructure – for instance, GIS and remote sensing software licenses, climate modelling software, database, and analytics platforms will be procured under the soft component. The **Human Resources ₹1 Cr** is planned as the initial corpus to support the salaries of key staff, especially in the start-up phase before regular university budgeting or externally funded projects kick in. This amount roughly covers a year of payroll for a modest core team; by Year 2 or 3, as more staff are added, the expectation is that part of their costs may be borne by project funds or university support.

The budget table above reflects a *one-time setup and initial operation* cost. We anticipate that after this initial investment, the Centre will increasingly leverage **external funding** (research grants, consultancy income, and regular plan funds from government/UGC) for its growth. Nonetheless, the ₹9 crore investment is crucial to establish the Centre's capabilities. All expenditures will follow standard financial norms with transparency and oversight. A detailed itemized budget can be provided separately, and the Centre will maintain financial records to ensure accountability for each budgeted rupee.

8.0 Space Requirement and Infrastructure Allocation

For the effective establishment of the Centre for Disaster Management and Climate Change (HIM-DR3), adequate and strategically located physical infrastructure is essential. It is proposed that:

- **Centre Office and Academic Wing:** Space may be allocated in the **Old Dispensary Building** of the university for housing the administrative office, faculty cabins, classrooms, seminar rooms, and IT-enabled training facilities required for academic, research, and outreach activities of the Centre.
- **Geotechnical and Infrastructural Research and Testing Facility (GIRTF):** In order to support high-end geotechnical testing, structural diagnostics, and experimental research, it is proposed that the **basement and first floor of the upcoming academic block (Multiphase–III)** be earmarked for the testing facility. This space will be technically appropriate given its structural strength and

proximity to the **main access road**, which is essential for the transportation of testing materials, equipment, and large-scale specimens.

In addition to serving the Centre's independent objectives, the proposed facility will also support the academic and practical needs of existing university programs—including **B.Tech. in Civil Engineering, M.Tech. in Geotechnical Engineering**, and **Ph.D. in Civil Engineering**—by providing critical infrastructure for experimental learning, research, and project-based activities.

This integrated infrastructure plan ensures both immediate functional readiness and long-term academic synergy with the university's broader vision.

9.0 Expected Outcomes and Impact

By the end of the initial three-year implementation, the HIM-DR3 at HPU is expected to yield significant outcomes that justify the investment and set the stage for long-term impact across the Indian Himalayan Region. The following are the key **expected outcomes**:

- **Launch of Academic Programs & Trained Graduates:** The Centre will successfully roll out its **postgraduate and doctoral programs**, filling an educational gap in the region. By Year 3, the first batch of ~20 Master graduates in Disaster Management and Climate Resilience will be entering the workforce, equipped with interdisciplinary skills tailored to mountain hazard challenges. Additionally, a pipeline of Ph.D. scholars will be in place, contributing original research. This human capital outcome means a cadre of young professionals – many of them from Himalayan states – will be available to serve in state disaster management authorities, environmental departments, NGOs, and academia, thereby strengthening regional capacity for DRR and climate adaptation.
- **Interdisciplinary Research Outputs:** The Centre's research activities will produce tangible **knowledge outputs**. We expect numerous research studies, publications in journals, and technical reports focusing on Himalayan disasters and climate risks. For example, by Year 3 the Centre may publish a comprehensive "**Himalayan Risk and Resilience Annual Report**" highlighting findings such as updated landslide hazard zonation maps for Himachal, climate trend analysis results, or case studies of community resilience best practices. These outputs will not only advance scientific

understanding but will also inform government planning (e.g. feeding into state disaster management plans or climate action plans). Over time, the Centre aims to become the go-to source for data and expertise on Western Himalayan hazards, thereby influencing policy and academic discourse nationally.

- **Operational Geotechnical Testing & Advisory Services:** The **GIRTF testing facility** will be up and running, providing specialized testing and advisory services to stakeholders. By Year 3, the Centre likely will have undertaken several consultancy projects -- for instance, testing construction material samples for PWD projects, conducting site soil analysis for new hill road alignments, or evaluating a landslide site for a remedial design. These services translate to improved quality assurance for infrastructure in the region (safer roads, buildings, bridges, etc.) because local agencies now have a competent facility to rely on. An added outcome is the revenue generated through these consultancies, which will be plowed back into Centre activities (making the Centre progressively more self-sustaining). The Centre's involvement in real-world projects also raises HPU's profile as an institution delivering public value.
- **Capacity Building of Officials and Communities:** Hundreds of individuals would have directly benefitted from the Centre's **capacity-building programs** in the first three years. This includes government officials (from line departments, district administrations), engineers and planners, as well as grassroots actors like school principals, NGO workers, and village volunteers. The outcome is a measurable increase in awareness and preparedness at multiple levels. For example, officials trained by HIM-DR3 may go on to prepare better district disaster management plans or establish emergency operations centers; village trainees may initiate community disaster committees or improve local early warning dissemination. In effect, there will be an emerging **network of trained DRR practitioners** across Himachal Pradesh (and other hill states) connected to the Centre. These individuals can act as change agents, improving readiness and reducing disaster response times in their respective domains.
- **Pilot Early Warning Systems and Mitigation Measures:** Through its research and technological innovation initiatives, the Centre expects to develop at least a few **prototype early warning or mitigation solutions** and demonstrate them in the

field. For instance, a landslide monitoring system with rain thresholds might be installed in a pilot area (like an annually active landslide site) in collaboration with the district authorities, providing community alerts during heavy rains. Or the Centre might design and help implement a small-scale bioengineering slope stabilization project (plantation and drainage) in a village that experienced a minor landslide, then monitor its effectiveness. Similarly, an SMS-based flash flood warning system could be tested for a prone river valley. These pilots would be documented and, if successful, could be scaled up by government – showing the Centre's role in catalysing **practical risk reduction measures** on the ground. Even if small in scale initially, such interventions directly contribute to reduced losses (for example, an early warning giving people time to evacuate from a landslide-prone slope in one instance).

- **Enhanced Policy and Planning Support:** By virtue of the Centre's expertise, HPU (and by extension, the Himachal Pradesh state) will gain a stronger voice in national policy dialogues on DRR and climate change. The Centre's faculty or outputs may be incorporated into important policy processes – e.g., HIM-DR3 could be asked to contribute to the revision of the **State Disaster Management Plan** or the **Himachal Pradesh Climate Action Plan**, ensuring these documents are science-informed and up-to-date. The Centre might also provide briefings to the State Disaster Management Authority or technical inputs to NDMA's guidelines (for example, if NDMA is developing guidelines on landslide risk management, HIM-DR3 could be a contributor). The outcome is an elevated **policy advisory role**: the Centre will effectively function as a think tank for the Himalayas, ensuring that local perspectives and data are reflected in state and national strategies. In the long run, this can influence resource allocation and project designs to be more risk-sensitive (e.g., advocating for landslide risk assessments to be mandatory before road projects in hills).

- **Institutional Collaborations and Networks:** The Centre will have established formal **collaborations/MoUs** with several leading institutions by Year 3, creating a strong network or consortium for Himalayan disaster resilience. For example, an MoU with **NDMA** and **NIDM** will pave the way for joint training programs and research (possibly HIM-DR3 acting as a regional center for NIDM courses).

Partnerships with academic institutions like **IIT Roorkee, IIT Mandi, IIT Guwahati, JNU**, etc., will lead to joint projects (such as comparative studies between Western and Eastern Himalayas), student exchange or internship programs (HPU students doing summer projects at those institutions and vice versa), and sharing of expertise. International connections (with organizations focusing on mountain regions, like ICIMOD in Nepal or universities in Japan/Europe experienced in mountain hazards) might also be in place, adding a global dimension to the Centre's work. The outcome is increased visibility and knowledge exchange – HIM-DR3 becomes part of a larger **knowledge network** on disasters and climate change, which enhances its access to information and best practices. Such collaborations can also attract further funding (multi- institution grant proposals) and ensure that the Centre's work is benchmarked against global standards.

- **Raised Community Awareness and Resilience Culture:** Though harder to quantify in the short term, one expected outcome is a general **improvement in disaster awareness and a culture of prevention** in the areas reached by the Centre's efforts. By conducting awareness campaigns, school programs, and community drills, the Centre will influence mindsets, leading to communities that are better informed about risks and proactive in reducing them. For instance, more villages might adopt community contingency plans, households could implement simple mitigation steps (like securing water tanks against earthquakes, maintaining proper drainage to avoid landslide triggers), and schools may integrate DRR into their activities. In government as well, thanks to HIM-DR3's advocacy and training, one might see changes such as departments incorporating climate risk screening into their projects or the state budgeting more for mitigation works. These are **long-term impacts** that start taking root within the initial years due to the Centre's presence.

Overall, by the end of the three-year initial phase, the Centre will have transitioned from concept to reality, with academic courses running, research in full swing, services being offered, and a growing reputation. **Lives and livelihoods in the Himalayan region will be safer** as a direct and indirect result of these outcomes: better-trained personnel managing disasters, improved early warnings and information reaching communities, more resilient infrastructure designs being applied, and policies that prioritize risk reduction.

These outcomes align not only with the Centre's internal objectives but also with the broader goals of the UN Sendai Framework for Disaster Risk Reduction (2015–2030). (substantial reduction in disaster losses by 2030) and the Sustainable Development Goals (especially SDG 11 on sustainable cities and communities, and SDG 13 on climate action). With continued support, HIM-DR3 will amplify these outcomes year on year, truly emerging as a **Centre of Excellence for the entire Indian Himalayan Region**.

10 Management and Monitoring

The **center will be headed by the Incharge/ Director to be appointed by the Vice-Chancellor of the University.** A governance and monitoring mechanism will be instituted to ensure that the HIM-DR3 operates efficiently, maintains high academic standards, and stays aligned with its mission. The management structure will integrate oversight from stakeholders and day-to-day executive control, comprising two main bodies: an **Advisory (Governing) Board** and an **Executive & Monitoring Board**, along with internal management roles.

10.1 Advisory Board (Governing Body): This apex body will provide strategic guidance, approve major plans, and ensure accountability to the higher authorities (UGC, state government, funding agencies). It will meet periodically (e.g. semi-annually) to review the Centre's progress and advise on future directions. The Advisory Board is a multi-stakeholder panel bringing together experts and representatives from key institutions. The composition is as follows:

- **Chairperson – Vice-Chancellor, Himachal Pradesh University (HPU):** As head of the institution, the VC (or their senior nominee) will chair the board, ensuring the Centre's goals align with university and state educational objectives.
- **Convenor** – Incharge/Director of the Centre: He shall coordinate board meetings and follow-ups, and serve as the primary liaison between the Board and the Centre's executive team.

The Advisory Board shall comprise internal members from various departments of the university, and external members representing the State Government, State Disaster Management Authority, NDMA/NIDM, IITs, central universities, or any other institution relevant to the mandate of the Centre.

10.2 Executive and Monitoring Board (Executive Committee): An Executive and Monitoring Board will be constituted for the effective functioning of the Centre. The Board will have a Chairman and a Convener, to be appointed by the Vice-Chancellor of the University. Its members will be drawn from the University and may also include representatives from other institutions relevant to the Centre's mandate. This will be an internal management committee focused on the Centre's operational oversight and coordination among divisions. It will meet more frequently (e.g. quarterly or monthly) to monitor project progress, address implementation issues, and ensure different units of the Centre work in harmony. The Executive Board's role is to translate the strategic guidance of the Advisory Board into action. It will track key performance indicators, ensure that milestones (like setting up labs, finishing curriculum development, publishing reports) are met on schedule, and troubleshoot issues (such as delays in procurement or staffing shortages). It essentially acts as the **Monitoring Committee** for day-to-day progress. In summary, the management and monitoring plan for HIM-DR3 involves **inclusive governance (via the Advisory Board), efficient execution (via the Executive Board)**, and a rigorous system of **performance tracking**.

11. Conclusions

The establishment of the Himalayan Centre for Disaster Risk Reduction and Resilience (HIM-DR^3) at Himachal Pradesh University is a timely and strategically significant initiative that directly responds to the growing challenges of disasters and climate change in the Indian Himalayan Region. The proposal presented above demonstrates a comprehensive plan—from rationale and objectives through implementation and governance—for creating a Centre of Excellence that will serve not only Himachal Pradesh but the wider Himalayas.

The timing of this Centre is critical. The past few years have underscored that the Himalayas are increasingly at risk, with climate change acting as a threat multiplier. Extreme weather events and catastrophic disasters in the region are no longer rare occurrences but frequent realities. We cannot afford a reactive approach. HIM-DR3 represents a proactive investment in prevention, preparedness, and resilience-building, which aligns with the understanding that every rupee spent on preparedness saves many

more in post-disaster recovery. The Centre's activities will contribute to reducing loss of lives and property over the long term, making mountain development safer and more sustainable. Strategically, the Centre fills a crucial gap in India's DRR architecture. By localizing expertise in the Western Himalayas, it decentralizes capacity away from metropolitan institutes and brings cutting-edge research and training directly to the frontlines of risk. This model resonates with national priorities: it realizes the Prime Minister's vision of involving academia in disaster management, operationalizes the Sendai Framework's call for science and technology institutions to play a bigger role, and supports India's commitments under the Paris Agreement and the Sustainable Development Goals (particularly SDG 11 and SDG 13 on resilient cities and climate action). HIM-DR3 will be an important vehicle to help India achieve the goals of the National Disaster Management Plan and the National Action Plan on Climate Change, particularly in the context of mountainous regions.

Technically aligned with the National Education Policy (NEP) 2020 and the University Grants Commission (UGC) mandate for multidisciplinary education and social relevance, HIM-DR3 proposes to offer certified academic programs and interdisciplinary research in disaster risk reduction, resilience, and climate adaptation. Through its postgraduate (M.Sc., M.Tech., MA), interdisciplinary Ph.D. programs, PG Diplomas, and certified short-term training modules, the Centre will function as a knowledge and human resource generator. These programs will follow model curriculum frameworks developed by the National Institute of Disaster Management (NIDM) and will incorporate modules from NDMA's and UNDRR's thematic guidelines. The Centre's scope includes applied and engineering research on landslides, floods, forest fires, ground subsidence, GLOFs, seismic risk, and other region-specific hazards. It will integrate geotechnical, hydrometeorological, socio-economic, and spatial data to develop risk-informed models and mitigation strategies. Special emphasis will be placed on early warning systems, risk-sensitive land use planning, resilient infrastructure design, and community-based disaster preparedness. Outreach programs will strengthen grassroots disaster awareness through engagement with schools, panchayats, first responders, and development agencies across the Himalayan region.

A key component of HIM-DR3 will be the establishment of a state-of-the-art

Geotechnical and Infrastructure Research and Testing Facility. This laboratory will support testing of construction materials, equipment, and terrain stability—enabling high-quality consultancy and research services for public departments and private agencies operating in the Himalayan belt. Organizations such as the Border Roads Organization (BRO), Central Public Works Department (CPWD), Himachal Pradesh Public Works Department (HPPWD), and the National Highways Authority of India (NHAI) stand to benefit directly from localized, scientific testing and technical inputs. This facility is expected to become a major source of revenue generation for Himachal Pradesh University through consultancy projects, technical evaluations, and collaborative research assignments focused on structural safety, slope stability, and disaster-resilient engineering solutions.

The expected impact of the Centre is multi-fold and far-reaching. Academically, it will raise the bar for disaster and climate studies, producing research insights, innovations, and skilled professionals who can transform risk governance. Practically, it will support governments and communities in taking informed action—from infrastructure planning to localized resilience strategies. Over time, the Centre's influence can catalyse policy changes, enhance disaster education, and create a Himalayan resilience coalition through inter-institutional collaboration.

Finally, HIM-DR^3 adds immense value to Himachal Pradesh University and the wider academic ecosystem of the state. HPU will emerge as a national leader in disaster and climate studies, attracting top faculty and students, enhancing funding and partnerships, and delivering localized, science-based solutions for complex challenges like landslides, flash floods, and agricultural vulnerabilities. This local knowledge creation and application is something no external institution can replicate with the same depth of commitment or contextual sensitivity. In conclusion, HIM-DR3 is not merely an academic proposal but a mission-critical intervention to build disaster resilience in one of India's most ecologically fragile and risk-prone regions. It will serve as a node for evidence-based decision-making, professional training, and policy innovation rooted in Himalayan realities. By aligning closely with NEP 2020, UGC, NDMA, NIDM, and UNDRR priorities, the Centre will contribute directly to national DRR objectives and global climate commitments—offering a scalable, replicable model for academic institutions to lead transformative resilience in high-risk geographies.

Himalayan Centre for Disaster Risk Reduction and Resilience (HIM-DR²)
Himachal Pradesh University, Shimla

Advisory Board

1. **Prof. Mahavir Singh**
   Vice-Chancellor, Himachal Pradesh University
   Chairperson
2. **Prof. T.G. Sitaram**
   Chairman, All India Council for Technical Education (AICTE)
   Member
3. **Sh. RD Dhiman**
   Chairperson, Himachal Pradesh Real Estate Regulatory Authority (RERA)
   Member
4. **Shri D.C. Rana, IAS**
   Director-cum-Special Secretary, SDMA, Government of Himachal Pradesh
   Member
5. **Prof. BK Shivram**
   Dean of Studies, Himachal Pradesh University
   Member
6. **Prof. Amit Kumar Dhiman**
   Head, The Centre of Excellence in Disaster Mitigation and Management,
   Indian Institute of Technology Roorkee
   Member
7. **Prof. Deepankar Choudhury**
   Professor, Department of Civil Engineering, IIT Bombay; Chairman, Technical Advisory Committee, SDMA, Government of Maharashtra
   Member
8. **Prof. S. Sarkar**
   Director of the Uttarakhand Landslide Mitigation and Management Centre (UJMMC)
   Member
9. **Prof. Rajat Agrawal**
   Department of Management Studies
   Indian Institute of Technology Roorkee
   Member
10. **Prof. D.D. Sharma**
    Department of Geography, Himachal Pradesh University
    Member
11. **Prof. Nainjeet Singh Negi**
    Department of Physics, Himachal Pradesh University
    Member
12. **Dr. Mahesh Sharma,** Department of Civil Engineering (UIT), HPU
    Convenor

Himalayan Centre for Disaster Risk Reduction and Resilience (HIM-DR³)
Himachal Pradesh University, Shimla

Executive and Monitoring Board

1. **Prof. Nainjeet Singh Negi**
   Department of Physics, Himachal Pradesh University
   Chairperson

2. **Dr. Anita Sharma**
   Department of Psychology, Himachal Pradesh University
   Member

3. **Dr. Mahender Thakur**
   Department of Biosciences, Himachal Pradesh University
   Member

4. **Dr. B. R. Thakur**
   Department of Geography, Himachal Pradesh University
   Member

5. **Dr. Sushcela Negi**
   Department of Microbiology, Himachal Pradesh University
   Member

6. **Dr. Abha Chauhan Khimta**
   Department of Political Science, Himachal Pradesh University
   Member

7. **Dr. Disha Thakur**
   Department of Civil Engineering, University Institute of Technology (UIT), HPU
   Member

8. **Er. Ravi Negi**
   Department of Civil Engineering, University Institute of Technology (UIT), HPU
   Member

9. **Dr. Mahesh Sharma, Department of Civil Engineering (UIT), HPU**
   Convenor, Executive and Monitoring Board

(ANNEXURE-D)

Infrastructure Requirement For "Himalayan Centre for Disaster Risk Reduction and Resilience"

The "Himalayan Centre for Disaster Risk Reduction and Resilience (HIM-DR^3)" is initially proposed to operate from the premises of the Placement Cell, located on the ground floor of the Main Library Building and basement and the first floor of the new academic block (Multiphase–III) building. In the subsequent phase, additional infrastructure will be required to support the Centre's full-scale operations. This includes dedicated workspace for students, faculty, and staff, as well as essential infrastructure and wooden furniture for office areas and smart classrooms. The detailed requirements are outlined below.

Sr.No	Details of the Space & Infrastructure requirement	Qty.
1.	Space for Incharge Office	1 No.
2.	Space for Smart Class Rooms	3 Nos.
3.	Space for Faculty Rooms	5 Nos.
4.	Space for Administrative Office	1 No.
5.	Space for Server & Storage Control room	1 No.
	Details of the Furniture Requirement	
6.	Desk for Students (Wooden)	90 Nos.
7.	Lecture Stands (Wooden)	3 Nos.
8.	Executive Table for Director	1 No.
9.	Executive Chair for Director	1 No.
10.	Visting Chairs for Director Office	2 Nos.
11.	Office Table for Teaching & Non-Teaching Staff	8 Nos.
12.	Office Chairs	8 Nos.
13.	Visiting Chairs for Office	16 Nos.

(ANNEXURE-E)

Budgetary Provision for the Centre

Recurring Expenditure: The tentative expenditure incurred on the salary expenses is calculated to Rs. 1,22,80,000/- (Rupees. One Crore Twenty-Lacs) only.

Non-recurring Expenditure: The tentative expenditure incurred on the procurement of furniture is calculated to Rs. 25,00,000/- (Rupees. Twenty-Five Lacs) only.

The total estimated project cost is for Rs 9.0/- Crores and the implementation of the project is proposed in two parts:

This estimated cost of this project proposal acts as initial seed money for establishment of Himalayan centre for Disaster Risk Reduction and Resilience and Geotechnical and Infrastructural Research and Testing Facility (GIRTF). Once the initial set-up is ready, we will obtain secondary funding from agencies like SDMA, NDMA, NIDM, Central and State Govt. etc.

Estimated Cost for Phase-I: (Rs. 5 Crores)

Basic infrastructure and testing facility setup, and hiring of core manpower for the Centre.

Estimated Cost for Phase-II (Rs.4 Crores)

The Implementation Plan for Part-2 of the Himalayan Centre for Disaster Risk Reduction focuses on academic programs, interdisciplinary research, field-based training, and knowledge dissemination tailored to Himalayan disaster risks and climate resilience.

ANNEXURE-F

Geotechnical and Infrastructural Research and Testing Facility (GIRTF)

under

Himalayan Centre for Disaster Risk Reduction and Resilience.

S. No.	Testing Equipment Details
1	Material Testing
2.	Geotechnical Testing
3	Geological Survey and Rock Testing
4	State of the art equipment for seismic and subsidence studies
5	Software for Disaster Related Research

List of Equipment (Material Testing)-1

S. No.	Name of Instrument	Specifications	Applications
1	Hydraulic Universal Testing Machine (CAPCITY 3000 KN)	The machine shall capable to measure through a dedicated software, parameters like Ultimate Tensile Strength, Yield Strength, % Elongation, Breaking Load, Modulus of Elasticity, Poisson's ratio etc. at specified load to measure the mechanical properties of the tested material. **Technical Specifications:** **Measuring Capacity:** The machine shall have microprocessor based electronic panel and precision strain gauge .type Pressure/Load transducer for load measurement. **Measuring Range:** 1 to 3000 kN **Least Count of Load:** 0.1 kN or better depending upon the max. load measurement. **Ram Stroke:** min. 300 mm or Higher **Stroke Display Accuracy:** 0.01 mm Additional compression testing frame-4000 kN capacity to be used by the same machine.	• Tensile tests on steel rounds up to 84 mm dia. • Flats up to 72 x 100 mm, wire strands up to 15.2 mm dia. and electro welded steel grid. • Transverse and Bend and re-bend tests on steel specimens; Shear test on rounds; • Compression tests on concrete cubes and cylinders. • Flexural test on concrete beams. • Indirect tensile test on cylinders, cubes and paving blocks. • Determination of the Modulus of Elasticity of concrete (on a second frame).
2	Vibration Machine for Motor Cube	For the preparation and compaction of 70.7 mm mortar cube specimens. The mould table is mounted on four springs attached to an eccentric shaft which allows each sample to be vibrated at 10000-12000 cycles per minute in accordance with the specifications.	Quality Control in Cement and Mortar Production
3	Ultrasonic Pulse Velocity	**Ultrasonic pulse velocity tester** Time measuring from 0 to 9999,9 µS Resolution: 0, 1 µS The standard appliance includes: ¼ VGA colour touch screen, • Two between 50 -60 kHz probes with connecting cables. • Calibrating cylinder and contact paste • Strong anti shock case holding the instrument and the accessories. • Battery pack Li-Ion 11,1V 3000mA.h • External feeder 230V/24V and battery charger • Weight : 3 kg Approx An ultrasonic pulse velocity (UPV) test is an in-situ.	• Non-destructive test to check the quality of concrete and natural rocks. The strength and quality of concrete or rock is assessed by measuring the velocity of an ultrasonic pulse passing through a concrete structure or natural rock formation.

4	Core Drilling Machine	Typically 150 mm (extendable to 200 mm with optional accessories)	It suitable to Drill cores of Concrete, Rocks, Stones, Tiles or the similar material.
5	Rebound Hammer	Impact Energy- 0.735 Nm Concrete Compressive Strength range – 10-100 N/mm^2 Spring Extension- 75mm Max. No. of impact in series -99 Display- 17×71 pixel Battery life- greater than 5000 impacts between charges Charge connection- USB type Operating Temperature- 0 to 50 degrees centigrade	To non-destructively estimate the compressive strength of concrete and assess its quality and uniformity.
6	Rebound Hammer Digital	Rebound hammer test is done to find out the compressive strength of concrete by using rebound hammer. The rebound of an elastic mass depends on the hardness of the surface against which its mass strikes.	IS:13311 (Part 2), ASTM C805, EN 12504-2, BS 1881-202
7	Cement Auto Clave	• Working Pressure: 21 ± 1kg / cm2 at 215° C • Pressure Vessel: ID 150 mm×Depth500 mm • Weight(Approx.): 70 Kg • Heater : 2000 Watts • Supply : 220V, 50Hz, 1 phase • (110V, 60Hz Models are available • The following accessories are required to be included in the Digital Autoclaves for inbuilt safety measures. • Temperature Controller for temperature range 537.7 C • set up to 218 C with accuracy 0.1 C. Temperature • Controlled within +1 C. • Pressure Indicator-cum-Controller: This indicates the pressure up to 21 bar& after that it works as a controller & cut off the power supply at 23 bar. • Pressure Indicator supplied has capacity of 25 bar, • resolution 0.1 bar. • Safety Valve supplied is to be set at 24 bar. • If temperature controller as well as the indicator fails then Pressure Releases at 24 bar.	Assesses the soundness and potential for delayed expansion in cement samples. It accelerates the hydration process of cement, simulating conditions that can lead to undesirable volume changes over time.

8	Hydraulic Jacks Cap. 3000 kN, with Pressure gauge	Hydraulic Jacks is specially designed for use in inverted position i.e. for loading from top to bottom. A base plate with holes is provided in the jack to fix it with a loading frame of appropriate capacity. A retracting spring is incorporated in the jack and rams assembly which pulls the ram back into the jack cylinder after the release of the load.	Hydraulic Jacks is specially designed for use in inverted position i.e. for loading from top to bottom.
9	Curing Tank (For accelerated curing)	Curing Tank for 6/12 cubes of 150 mm/ 70.6 mm size 24-hour cycle from time of mixing. • Temperature range: Ambient + 5°C to 95 to 100°C Curing Temperature for Concrete in lab environment for 0 Temperature range - 23+ 2 C & Relative humidity - 50 + 10% and should be fully insulated, complete with a hinged lid, heater, thermostat and recirculation pump.	Used for curing of concrete, cement cubes before tesing.
10	Impact Test Apparatus	**Specification:** The instrument consists of a circular base with two vertical guides. The hammer of weight 13.75 ±0.25 kg can be raised to fall freely down the vertical guides. The height of fall can be adjusted through 380 ± 5mm. The hammer is provided with a locking arrangement. The hammer falls freely to the base and is removable for emptying. Supplied complete with metal measures 75mm Dia x 50mm high (for specimen preparation) and tamping rod 230mm long x 10mm Dia.	Used to determine the aggregate impact value which provides a relative measure of the resistance of an aggregate to sudden shock or impact.
11	Mortar Mixer	The mixed should have timer Facility available. It should have the Auto function to carry out the test Automatically. Sand disposal to be done automatically. The mixed should be of stainless steel mixing bowl with a capacity of 4.75 litres. The paddle, made of stainless steel, should have both planetary and revolving motion for uniform mixing. Suitable for operation on 415V, Three phase, 50Hz AC supply.	• Mixing of large batches of concrete.
12	Weighing Balance Digital	• Capacity 100 kg, least count 10 gm • Capacity 20 kg, least count 0.1 gm • Capacity 200 gm, least count 0.001 gm	It is used to measure the accurate weight of the cement, aggregate, sand and other materials used in concrete.
13	Loss Angles Machine	Frequency 50/60 Hz Voltage-440V Brand Micro technologies	Determine abrasion value of aggregates.

		Phase- 3 Phase Motor Power-1HP Speed- 30-33 rpm	
14	Torsion testing machine	Torsion Testing Machine Suitable for operation on 440V, 50Hz, Three Phase, AC supply , table top preferable. Equipment consisting of A twisting head with a chuck for gripping the specimen and for applying the twisting movements to the specimen. • A weight head, which grips the other end of the specimen & measures the twisting movement or torque. Sturdy & reliable design • Easy to operate • Measurement of Torque with electronic load cell. • Accuracy of Torque measurements ± 1% above 1/5th of the range. • Can conduct torsion tests on both metallic & non metallic materials. Maximum capacity : 100Nm Least Count : 0.01Nm Maximum clearance : 500mm between grips Grips for square specimens : 5-15mm Grips for flat specimens : 5-12x40mm	
15	Fatigue test apparatus	Fatigue Testing Machine 200kg Maximum bending moment:- 200Kg-cm Bending moment adjustment:- 25-200Kgcm Ranges:-5-125kg-cm and 125-200Kg-cm Gripping Dia specimen:-12mm Testing Dia of specimen:-8mm Rotating speed:-4200rpm Accuracy:- +-1% Digital counter-8 Digit Power required:-0.5HP Supply:-3 phase ,415V,50Hz AC supply Overall size:-1000L X 500W X 600H Weight:- 120 Kg	
16	Tray	Sample Tray (Enamel Tray), Size 600x450x50mm	Mixing of materials
		Sample Tray (Enamel Tray), Size 450x300x40mm	
		Sample Tray (Enamel Tray), Size 300x250x40mm	

17	Mortar Vibrator Machine with Digital timer	Vibrating Machine also called mould vibrator or mortar cube vibrator Concrete moulds are easily cast by using a tamping bar or a vibrating table. However, air trapped in cement mortar paste cannot be thus removed while casting cement mortar moulds. Frequency: 12000 ± 400 cycles per minute	Concrete vibrators are used to eliminate air pockets that can remain when pouring concrete that can ruin the integrity of concrete
18	Vibrating Table	The equipment should have vibro motor and AC drive Artangement so as to have the frequency to be varied steplessly between 60 Cycles/ sec and 43 Cycles/sec. operation on 220 V, 50 Hz, Single Phase, Vibrating Table size 2m × 1m. Max. weight- 800-1200 kg	Compaction of concrete mix, releasing the air entrapped.
19	Flow Table (Motorized)	The flow test is performed to measure the workability of concrete. In this test the workability of concrete is measured by examining the flowing property or fluidity of concrete. The flow test is used to measure the workability of high or very high workable concrete, which eventually collapses a slump.	
20	Blain's Air Permeability Apparatus (with ISI Certification Mark, IS:5516)	The apparatus should consist of 1. Permeability Cell 2. 'U' Tube Manometer, mounted on stand. 3. Perforated Metal Disc. 4. Plunger. 5. Rubber Stopper. 6. Rubber Tube, 20 cm long. 7. Filter Paper Discs (Twelve Nos.) 8. Dibutylphthalate Liquid, 100 ml bottle. 9. Punch. 10. Non-Perforated Disc. 11. Suction Bulb.	• Determining the fineness of Portland Cement measures the specific surface area of fine materials in square centimeters per gram of test sample. • By using this apparatus, a quantity of air is drawn through a bed of definite porosity.
21	Hot Air Oven	Laboratory Ovens have been designed for drying asphalt, soil, rock, concrete, aggregate or similar materials. 50, 120, 250, 500 and 750 litter capacity models are available. The interior is manufactured from stainless steel and the exterior is robustly constructed from sheet steel finished in powder coated paint. Max. Temp- 300°C Capacity- 100-500 kg Airflow direction- Vertical down airflow	Removes moisture from the test samples.

22	Thickness Gauge Apparatus	Material- Iron and Steel These instruments are available with probes for non-destructible measurements	Thickness gauges provide highly accurate and reliable measurements for most substrates and coatings.
23	Length Gauge Apparatus	Consists of a hard wood base with vertically mounted metal studs as specified in the IS 2386 (Part-I)	
24	Concrete Permeability measuring apparatus	• Concrete Permeability Apparatus 3 cell model for 100 mm cube (AIM 379) • Concrete Permeability Apparatus 3 cell model for 100 mm cylinder (AIM 380) • Concrete Permeability Apparatus 3 cell model for 150 mm cube (AIM 381) • Concrete Permeability Apparatus 1 cell model for 150 mm cylinder (AIM 382) • Concrete Permeability Apparatus 1 cell model for 300 mm cylinder (AIM 383) • Concrete Permeability Apparatus 3 cell model for 150 mm cube as per DIN Std. (AIM 384) All multi-units are to be provided with end pressure gauges. Beside this, each unit has to be provided with chamber pressure gauges of 21 kg/cm sq. and test pressure gauge of 17.5kg/cm.sq. To be supplied with 3HP double stage air compressor for applying pressure up to 15kg/cm2 and specimen casting mould.	• To determine how easily water can pass through concrete samples. It typically involves a pressurized cell where the concrete specimen is placed and water is forced through it under controlled pressure. • To determine how easily water can pass through concrete samples. It typically involves a pressurized cell where the concrete specimen is placed and water is forced through it under controlled pressure.
25	Casting Molds Cubes	(150 ×150 × 150 mm)	Casting cubes for testing
26	Beams	Beam Mould 100 mm x 100 mm x 500 mm size (Cast iron) Beam Mould 150 × 150 × 700 mm (cast iron)	Casting beams for testing
27	Cylinders	Cylindrical Mould Cast Iron, Split length wise 150 mm x 300 mm high with ISI certification mark IS:10086	Casting cylindrical samples for testing
28	90micron sieve with pan & cover	Brass Frame Sieve (200mm dia x 90 microns), Pan and Cover for 200mm dia sieves	Fineness of cement used for testing
29	Sieve set for grading of fine Aggregates	Specification: 600, 300, 150, 90, 75 (Micron), & 1.18, 2.36, 4.75, 10 (mm) for grading of fine & lid-pan Material of construction: Brass Type: Seamless Weight: Preferably 250gm- 350gm With NABL Certified	

30	Sieve set for grading of Coarse Aggregates	1) Sieve G.I. Frame 30cm dia Sieve sizes:80mm,40mm,20mm,10mm, Pan and Cover of 30cm dia for sieves Material of construction: Galvanized Iron Protective Coating : Powder Coating Weight: preferably 800gm- 900gm Wire mesh Preferably imported quality With NABL Certificate 2) Sieve G.I. Frame 45cm dia Sieve sizes:80mm,40mm,20mm,10mm, Pan and Cover of 35cm dia sieves Material of construction: Galvanized Iron Protective Coating : Powder Coating Weight: preferably 800gm- 900gm Wire mesh Preferably imported quality With NABL Certificate	Partical size determination of aggregate to be used as building material.
31	Motorized sievo shaker	Two adapter of 300mm dia and 200 mm dia sieve stake Voltage- 250 V A.C. Speed – 270 rpm Driven by- 0.25 hp motor Reduction gear Carry up to 7 Sieve of 6 inches to 8 inches dia.	Use to sieve the samples of aggregate, cement.
32	Vee-Bee consist meter (IS: 1199 - 1959)	Vibration Table size 380mm long and 260mm wide, resting upon elastic support at a height of about 305mm above the floor, complete with start & stop Switch, Cord and Plug. • Supplied complete with a sheet metal container with lifting handles which can easily be fixed to the Vibrating Table. • To supply with lifting handles and a Tamping rod of size 16mm dia and 600mm long, rounded at one end. • All accessories to provide along.	To assess the workability of concrete, providing valuable insights into its ability to be placed, compacted, and finished effectively on a construction site.
33	Concrete Mixer	Specifications: Concrete mixer: laboratory type, electrically Operated. • The counter balanced drum to tilt 1.1/2 to 2cu.ft.mix. The total drum volume is atleast 2 cu ft. Mounted on a sturdy rubber tyred stand, equipped with 1h.p. electric motor. Drum speed of 20-22 rpm. Suitable for operation on 220/230 volts A.C. single phase.	
34	Longitudinal Compressometer for Modulus of Elasticity	Ref: ASTM-C469 This apparatus is to be used for determination of the strain and deformation characteristics of cement concrete cylindrical specimens of 150 mm	

		dia x 300 mm length. The Compressometer should consist of two frames for clamping to the specimen by means of five tightening screws with hardened and tapered ends. Two spacers should be able to hold the two frames in position. The apparatus has to be provided with an adjustable pivot rod rests on pivot screws & Dial gauge 0.002mm x5mm.	
35	Electronic Weighing Balance	Specification: 300 KG Weighing Balance to weigh the materials in the Concrete Lab with Pan size of 600 x 600 mm. Least count for the measurement of samo is 50g.	
36	Drying Shrinkage and moisture movement	IS: 4031, IS 9459, ASTM- C490 1) Length comparator apparatus – Apparatus has to be used to find out the initial drying shrinkage, drying shrinkage and moisture movement. The equipment should be provided with the following replaceable parts:- Length comparator frame Reference bar Digital dial gauge reading to 0.001mm is fixed at top. An adjustable cross plate is fitted at the top. 2) Volume change apparatus- 2) The apparatus should consists of a mould 100 x 100 x 250 mm effective gauge length (Distance between the inner most points of the reference points) complete with base plate and four reference points of standard length. The equipment has to be supplied complete with Length Comparator	• Determination of change in size of concrete or cement sample, brought about by a change in moisture content. • Test can be performed on freshly made specimens or specimens taken from existing structure. • The apparatus should be used to find out the length and volume change.
37	Bulk Density, voids and Bulking	Ref. standered: IS 1199, IS 10079, BS :1681 Used to determine unit weight of aggregates and voids in between aggregate. The Cylindrical metal measures with ISI Certification mark IS-2385 (Part 3) consists of one each of the following measures: 3 litres,15 litres, 30 litres and supply complete with tamping rod of 16 mm dia x 60 cm long have to be provided.	
38	Density bucket	Ref. standered: 2386: Part 3 Ruggedly constructed from galvanised wire mesh with handle, Size 20 cm dia x20 cm high	Density of sample is measured.
39	Crushing Value Apparatus	Crushing Value Apparatus Ref std: IS 2386 (Part IV) Crushing value apparatus will be used for measuring the resistance of an aggregate to crushing as per IS 2386	The fine aggregate crushing resistance so as to evaluate the aggregate road construction applicability.

		(part 4). The equipment should consists of following parts:- M.S Cylindrical container, plunger, base plate, tamping rod of circular cross-section 16mm diameter and 60 cm long, rounded at one end, M.S Cylindrical container 150mm± 0.5mm diax 130mm to 140 mm high. Base plate 200 to 230 mm square x 6mm thick, Plunger of 148mm ± 0.5 mm dia x 100 to 115 mm high	
40	Vicat Apparatus	Vicat Apparatus, with ISI Certification Mark, IS:5513 It should contain Vicat Mould, Glass Base Plate, Initial Needle (in Plastic Case), Final Needle (in Plastic Case), Consistency Plunger (in Plastic Case), Mild Steel Base Plate, Vicat Mould Split Type, with Clamping Ring	Consistency, initial setting and final setting time of cement is determined.
41	Le-Chatelier apparatus	Le-Chatelier Mould with ISI Certification Mark Extensibility of Mould Apparatus (Resistance of Mould Test Apparatus) Le-Chatelier Flask) Glass flask 250 ml capacity, with graduated neck from 0 to 1 ml and from 18 to 24 ml in 0.1 ml graduation with accuracy of 0.05 ml. Weight approx.: 500 g	Determine specific gravity of cement.
42	Mould (50 mm)	Mould frame Cast Iron for 50 mm Cube with ISI Certification Mark as per IS:10086, the mould frame should be able to cast 3 moulds at one time.	
43	Gauging Trowel	Gauging Trowel Ref. Standard - IS:4031 100 to 150 mm long blade with straight edge. Weight 210 ± 10g	
44	Slump Test Apparatus	To be supplied complete, Slump Cone with the base plate, having cleats and swivel handle and Tamping Rod of 16 mm dia x 60cm long. The equipment should have ISI Certification Mark (IS:10086). Bottom diameter:20cm, top diameter:10cm, Height:30 cm.	Assesses the workability of concrete.
45	Compaction Factor Apparatus	Double hopper Aluminium casting cylinder with dimension of atleast 140x 275 mm. Top hopper 250x120x190mm. Bottom hopper 230x125x230mm. Span of 190 mm. Trap door. Tamping rod 590 mm. • As per IS: 1199, 5515 & relevant amendments, if any.	The compaction factor of concrete with low, medium and high workability.

		• Necessary accessories to be supplied along.	
46	Mould (150mm)	Cast Iron, 150 mm sized cube with ISI Certification Mark	Sample preparation for testing.
47	Tamping Rod	Tamping Rod, Steel, 16 mm dia x 600 mm length rounded at the lower end. The tamping rod should carry ISI Certification Mark IS:10086 Tamping Bar, Steel, 25 mm x 25 mm square ramming face, 400 mm long, 2kg in weight. The tamping rod should carry ISI Certification Mark IS:10086.	
48	Measuring cylinder:	Graduated measuring cylinder made of plastic with 1000ml Capacity Graduated measuring cylinder made of plastic with 100ml Capacity Graduated measuring cylinder made of plastic with 50ml Capacity Graduated measuring cylinder made of plastic with 10ml Capacity	
49	Trowel	(i)Gauging Trowel, Ref Standard IS:5515, 200mm long blade, Weight 210 + 10 g (i)Gauging Trowel, Ref Standard IS:4031, 100 to 150mm long blade with straight edge, Weight 210 + 10g	
50	Spatula	Spatula, 100mm blade with wooden handle Spatula, 150mm blade with wooden handle	

Budget Required

S. N	Material Testing Facility	Approximate Cost (INR)
1	Equipment Cost	1 crore

Equipment (Geotechnical Testing)-2

S. No	Equipment	Specifications	Application
1.	Direct Shear Apparatus (Motorized)	Technical Specification: The unit is provided with a turret type gear box to get 12 different constant rates of strain i.e 1.25, 0.625, 0.25, 0.125, 0.05, 0.025, 0.01, 0.005, 0.002, 0.001, 0.0004, and 0.0002 mm/min. and arrangements to carry out residual shear strength tests. Suitable for operation with 220V, 50 Hz, Single phase supply. It Should Comprise: - a) Shear box assembly, 60 mm square, complete with a U-bracket, guide pins and spacing screws, made of brass b) Gripper assembly consisting of two plain grid plates, two perforated grid plates, one base plate and one loading pad, all made of brass c) Two porous stones, each 6 mm thick, fitting the shear box d) Shear box housing of brass, complete with two ball roller strips e) Loading unit with normal loading of 8 kg/cm2 on 60 mm square specimen f) Specimen cutter for a specimen size of 60 mm x 60 mm x 25 mm g) Set of weights to give a normal stress upto 3 kg/cm2 through lever, comprising 4 of 0.05 kg/cm2, 1 of 0.1 kg/cm2, 1 of 0.2 kg/cm2, 3 of 0.5 kg/cm2 and 1 of 1 kg/cm2	Determines shear strength parameters of soil (cohesion and angle of internal friction). Useful for analysing stability of slopes, retaining walls, and foundations.

2.	Unconfined Compression Apparatus (Motorised, Proving Ring Type) Confirming to IS:2720(Part-X)	Technical Specification: a) The loading unit should be motorised and the gear system provides three different rates of strain 1.25 mm, 1.5 mm and 2.5 mm/min. and dial gauge holder b) Set of upper and lower platens, 150 mm dia c) Cone seating - 2 Nos. d) Proving ring adapter e) Proving ring 5 kN capacity (2 Nos.)	Measures unconfined compressive strength of cohesive soils. Used for assessing the strength of soft clays and silts.
		f) Dial gauge 0.01 x 25 mm (2 Nos.)	
3.	**Consolidation Apparatus**	**Consolidation Apparatus as per IS 2720 (Part XV)-1965: Single gang complete with gunmetal cell and Dial gauge 0.002 mm.** The standard outfit comprises of a fixed ring type of consolidometer cell for testing specimens of 60mm dia. x 20mm thick. Suitable for varying sizes from 50mm. dia.to100mm dia. specimens. SPECIFICATION : Loading unit of maximum capacity 20 kg/cm2 consisting of a loading yoke connected to a lever arm with a counter balancing adjustment and having a lever ratio of 1: 10, the whole assembly being mounted on a steel frame stand Fixed ring type of consolidometer (Oedometer) cell assembly for testing 60mm dia. × 20mm thick specimens comprising : 1. Fixed ring for specimens 60mm dia. × 20mm. thick with a guide ring. 2. Pair of porous stones for 60mm. dia. specimen. 3. Pressure pad, perforated. 4. Channelled base with water inlet. 5. Gasket. 6. Flanged water jacket.	Determines settlement characteristics of soil due to one-dimensional loading. Calculates coefficient of consolidation and compression index
4.	**Triaxial shear test**	**Triaxial shear test and Unconfined compressive strength test apparatus electrically operated as per IS 2720 (Part**	Measures shear strength under controlled drainage conditions.

		XI)-1993 & IS 2720 (Part XII)-1981: Load Frame, Motorised, 30 speeds, 50 KN Triaxial Cell, Stationary Bushing, 38mm dia having Top loading pad, Perspex, 38 mm dia. 1 No. • Plain Perspex disc 38mm dia x 6 mm thick 1 pair. • Porous Stone 38mm dia x 6 mm thick. 1 pair. • Sheath stretcher for 38 mm dia specimen 1 No. • Two way split former for 38 mm dia specimen 1 No. • Rubber sheath for 38 mm dia specimen 12 Nos. • Drainage tube (short), 38 mm 4 Nos. • Drainage tube (long), 38 mm 4 Nos. • 'O' rings for 38mm dia specimen 4 Nos.	Used for CU, CD, and UU tests to simulate field stress paths.
		• Split Mould, 38mm dia 1 No. • Top loading pad 38mm (plain) 1 No. • proving ring 2.5 kN capacity with NABI. certificate	
5.	Laboratory Vane Shear Apparatus (Motorized) IS:2720(Part-XXX)	Technical Specification: The apparatus should comprises of the following: - a) A torque applicator having a base with a hole for holding the specimen mould in position, supporting frame carrying torque head adjustable in height and a graduated drum to measure the deformation of springs b) A set of four springs, one each of 2 kg cm, 4 kg cm; 6 kg cm and 8 kg cm c) A vane of size 12.0 x 24.0 mm long with a vane rod d) Specimen container to take a specimen of 50 mm dia x 75 mm high e) Wooden carrying case for the complete apparatus But torque head is electrically driven by a small reduction geared motor with a strain rate of 6°per minute approximately. Accessories: Stand with fixtures suitable for 38 mm, 50 mm dia tubes.	Determines undrained shear strength of soft cohesive soils. Especially suitable for in-situ and laboratory testing of clay.

6.	Swell Pressure Test Apparatus Confirming toIS:2720 (Part-XII)	Technical Specification: The apparatus should consist of: - a) Load frame, 5000 kg (50 kN) capacity, hand operated b) Mould with 100 mm internal dia x 127.3 mm high, 1000 cm3 volume c) Proving ring 250 kg (2.5 kN) capacity with load transfer bar and steel ball d) Soaking tank 25 cm dia x 20 cm high e) Dial gauge 0.01 x 25 mm	Measures swell pressure in expansive soils. Helps in foundation design over swelling soils.
7.	Electronic Direct Shear Apparatus, Large (Motorised) Confirming to IS: 2720 (Part-XXXIX/Sec. I)	**Technical Specification:** This is required for testing 300 mm x 300 mm x 150 mm soil sample containing gravel with particle size more than 4.75 mm. The unit should provide 72 different constant rates of strain for shear load ranging from 0.0014 mm/min. to 10.16 mm/min and is suitable for carrying our residual shear strength test. It should be provided with electronic digital system, sensors for vertical displacement, horizontal displacement, load cell for sharing load, standard accessories and spares. Broad Specification of Digital Display Unit is given below: Sensor: a) Displacement sensors ± 50 mm - 2 Nos. b) Load cell 50 kN - 1 No Suitable for operation on 220 V, 50 Hz, Single phase suppl	Tests large soil samples containing gravel. Used for evaluating shear strength of coarse-grained soils.

8.	HS28.685 Automatic Triaxial Testing System Conforming to IS: 2720 (Part XII) & BS 1377]	A fully Automatic and Computer controlled Triaxial Shear Test Apparatus enables performing of Triaxial tests conforming to requirement of IS-2720 (Part-XII), HS1377. All the modules namely Load Frame, Confining It can perform tests under the following conditions: - 1. Shear in UC, UU, CU, CUBar & CD Tests 1) DIGITAL LOAD FRAME It is a two-pillar type load frame that can accommodate triaxial cell upto 100 mm dia specimen. Rate of strain is precisely controlled through micro stepper motor of fractional horse power operating at 220 volts, 50 Hz, single phase supply. Specification Load Capacity - 50 kN Test Speed - 0.00001mm/min. to 9.9999mm/min. Travel - 100 mm Limit switches and L.E.D. are incorporated in the hardware to arrest the travel limits and also to indicate the direction of movement (up/down). Computer Intel Core i5, 500GB HDD, 4GB DDR RAM, 4USB	Fully automated triaxial testing of UC, UU, CU, and CD types. Suitable for high-precision and programmable soil strength evaluation.
		ports, Keyboard, Mouse, 19" LCD monitor, UPS 500VA, Deskjet Color printer (1) Software For Triaxial Test i. Does all calculations of UC, UU, CU, CU & CD triaxial tests	

9.	Automatic Consolidation Testing Apparatus	Technical Specification: The complete system should consist of followingsLoading Frame (1 No) It should be a standalone table top, motorized driven by stepper/servo motor. corrosion protected frame and is suitable for incremental consolidation test. Suitable arrangement should be provided in the frame to fit external load cell (20 kN) and displacement transducer (20 mm) for measurement of applied load and deformation respectively. Specification a) Max. load capacity - 20 kN b) Platen travel – 100 mm c) Specimen size - upto 100 mm Facility to save the data after the test Computer with Application Software System is provided with computer for data acquisition and analysis of test resultsComputer Intel Core i5, 500GB HDD, 4GB RAM, DVD R/W Drive, 4USB Ports, Key Board, Optical Mouse, 17" TFT LCD Monitor, LaserJet Printer, UPS 1KVA. (Note - Latest available model of the computer and printer should be supplied at the time of delivery) Application Software	Automates one-dimensional consolidation testing. Facilitates data acquisition and analysis digitally.
10.	Rapid Moisture Meter Confirming to IS:2720 (Part-II), IS:12175	**Technical Specification:** Moisture content determination of soil is an important part of listing in the field of agriculture, civil engineering, pharmaceutical industry etc. Test is based on the chemical reaction between calcium carbide and moisture in the soil. The amount of gas formed is directly proportional to the moisture content	Quickly determines moisture content in soil. Useful for field testing without electricity.
		which is indicated in terms of percentage on the pressure gauge. The units should have following features: a) Fast accurate and reliable b) No electricity required c) Moisture range 0 – 50% d) Standard weight on balance – 6 gm e) Gauge division – 0.50	

11.	HS.20.10: Electronic CBR Test Apparatus ASTM D-1883	**Technical Specification:** With digital display and data acquisition system for plotting data, etc. compatible to the computer. a) Motorised load frame 100 kN capacity with single rate of strain of 1.25 mm/min (Load Frame Only) b) CBR mould of 150 mm inner dia x 175 mm high with clamping lugs, Extension collar 150 mm inner dia x 50 mm high and perforated base plate, all made of mild steel complete with stay rods **Electronic system:** - It should be a state-of-the-art microprocessor based digital display unit and signal conditioning unit. It should have a 4 x 20 characters L.C.D. display and RS232 port for connecting it to the computer. The system should have the facility of store in its memory about 50 test results which can be off loaded to the computer whenever required. If only numerical values are to be printed, then the same should be done directly on the printer. Sensors: - a. Load cell - 100 kN b. L.V.D.T - ± 20 mm	Evaluates subgrade strength of pavements using California Bearing Ratio (CBR) test. Suitable for both laboratory and field samples.
12.	SWCC (Soil-Water-Characteristic-Curve-Equipment)	1) SWC- 150 Fredlund SWCC Device Unsaturated soil testing system used to obtain the complete soil-water characteristic curve (SWCC) of any soil. The Fredlund SWCC Device allows you to control suctions up to 15 bars and is capable of applying	Determines Soil-Water Characteristic Curve for unsaturated soils. Critical for unsaturated soil behavior and suction-based analysis.

		one-dimensional loading to specimens with a diameter of up to 71 mm. 1.1) SWC–PCA Pressure Cell Assembly Stainless steel SWCC cell with a load piston to apply normal stresses and/or measure specimen volume change. Accommodates soil specimens with up to 71-mm in diameter and up to 50 mm in height. The assembly includes load balance pressure compensator for uplift forces on normal load piston. 1.2) SWC–PCP Pressure Control Panel Complete pressure control system for direct control of pore air pressure, ua, at the top of the soil specimen with dual pressure regulators and gauges for precise measurement and control of soil suctions. 1,500 kPa high range and 200 kPa low range with manual valve range selection and low range overload protection. Note: Option 3 should be used if the intended air supply is a nitrogen bottle.	
13.	KD2Pro Thermal Conductivity Analyzer	**Technical Specifications** **Controller:** Power: 4 AA batteries Case Size: 15.5 cm x 9.5 cm x 3.5 cm Display: 3 cm x 6 cm, 128 x 64 pixel graphics LCD Keypad: 6 key, sealed membrane Data Storage: 4,095 measurements in flash memory (both raw and processed data are stored for download) Interface: 9-pin serial Read Modes: Manual and Auto Read **Sensors** 1. 6 cm (small) single needle (KS-1) Size: 1.3 mm diameter x 6 cm long Range: 0.02 to 2.00 W/ (m * K)(thermal conductivity) 50 to 5000 °C * cm/W (thermal resistivity) Accuracy: (Conductivity): ±5% from 0.2 to 2 W / (m * K) ± 0.01 W/ (m * K) From 0.02 to 0.2 W/ (m * K) Cable length: 0.8 m	Measures thermal conductivity of soil. Used in geothermal, energy geotechnics, and thermal backfill studies.

14.	Non-corrodible air-tight container	Non-corrodible air-tight container (50 mm diameter and height 50mm)	Stores moist soil samples to prevent moisture loss. Essential for accurate moisture content testing.
15.	Density bottle	Density bottle of 50 ml with stopper having capillary hole	Determines specific gravity of fine-grained soils. Used in laboratory analysis of soil physical properties.
16.	Spatula	Spatula (LENGTH 150 mm) Spatula (LENGTH 200 mm) Spatula (LENGTH 300 mm)	Used for mixing, transferring, and handling soil samples. Helpful in sample preparation for various lab tests.
17.	Volumetric flask	Volumetric flask with stopper capacity 1000ml ("Borosil") Volumetric flask with stopper capacity 500ml ("Borosil")	Used for precise volume measurements in soil chemical analysis. Common in preparation of solutions for lab testing.
18.	Trowel	Trowel as per IS 10086: 1982	Transfers and levels soil in moulds and trays. Handy during compaction and moisture content tests.
19.	Sieves	SIEVES (a) IS SIEVES: 20cm. dia. Sieves in Brass Frame with NABL Certificate, S.S.Mesh:- Size:- 5.6 mm, 4.75mm, 3.35mm, 2.8mm, 2.36mm, 1.70mm, 1.18 mm, 850 micn., 600micn., 425micn., 300micn., 150 micn., 90micn., 75micn. With as per I.S 460-1962. Pan and cover for 20cm. dia Sieves made of brass. (b) IS SIEVES: 30cm. dia. Sieves in G.I. Frame with NABL Certificate, S.S.Mesh:- Size:- 80mm, 63mm, 50mm, 40mm, 37.5mm, 31.5mm, 26.5mm, 25mm, 22.4mm, 20mm, 16mm, 13.2mm, 12.5mm, 11.2mm, 10mm, 6.3mm,	Conducts grain size distribution of soils. Helps in classification of coarse and fine soils.

		4.75mm, 3.35mm, 2.36mm. With as per I.S 460-1962. Pan and cover for 30cm. dia sieves made of G.I.	
20.	Pycnometer	Pycnometer as per IS 2386 (Part III)- 1963 with Glass Cone, Capacity 900ml. approx. having a metal conical screw top with a 6-mm diameter hole at its apex. Pycnometer as per IS 2386 (Part III)- 1963 with Brass Cone, Capacity 900ml. approx. having a metal conical screw top with a 6-mm diameter hole at its apex.	Measures specific gravity of soil solids. Used for both coarse and fine soils.
21.	Measuring graduated Cylinder	Measuring graduated Cylinder of 1000ml capacity (Borosil) as per IS 2386 (Part III)-1963 Measuring graduated Cylinder of 500ml capacity (Borosil) as per IS 2386 (Part III)-1963 Measuring graduated Cylinder of 250ml capacity (Borosil) as per IS 2386 (Part III)-1963 Measuring graduated Cylinder of 100ml capacity (Borosil) as per IS 2386 (Part III)-1963	Measures liquids for soil testing (e.g., water for compaction or sedimentation). Ensures precise volume control.
22.	Electronic weighing machine (Digital)	**Electronic weighing machine (Digital) with NABL certificate.** Capacity - 10kg L.C. – 0.1gm Capacity - 1kg L.C. – 0.01gm with Tare facility, In-built Battery Backup.	Measures soil mass accurately. Used in almost all soil tests involving weight determination.
23.	Desiccator Vacuum	**Desiccator Vacuum.** Plastic with transparent Top 300 mm	Preserves samples in a moisture-free environment. Prevents moisture absorption before weighing.
24.	Electric Oven : Hot Air Oven	**Electric Oven : Hot Air Oven:** Gravity convention type, thermostatically controlled double walled, inner made of Aluminium, outer of Mild Steel nicely hammerton spray-painted; in between wall heavily insulated with thick layer of glass wool, with double walled insulated door, temperature controlled by capillary type Thermostatic, temp. ranging from 50°C to 250°C , (can be set at 100 to 110°C). Fitted with motorized air circulation system &	Dries soil samples at controlled temperatures. Used to determine moisture content and prepare dry samples.

		inner chamber of stainless steel with digital controller cum indicator. Inner chamber size should be of 600 mm x 600 mm x 900 mm.	
25.	Motorised Sieve shaker	**Motorised Sieve shaker with Built-in-digital timer for 20cm dia. sieves which should be able to carry up to 8 sieves of 150 mm. or 200 mm. diameter. The shaker shall be driven by a ¼ h.p motor.**	Automates sieving for grain size analysis. Ensures uniform and time-efficient sample shaking.
26.	Digital Stop watch	**Digital Stop watch** with least count 1/10 sec.	Measures precise time intervals in sedimentation and consolidation tests. Used in time-dependent experiments.
27.	Pipette analysis test apparatus	**Pipette analysis test apparatus IS 2720 (Part 4)-1985:** Glass tube 50mm diameter, 350 mm long marked at 500 ml volume 1. Heavy brass funnel (diameter approx. 23 cm) on stand, 2. Small 50 µm or 63 µm sieve (diameter 8 cm). 3. 13 one litre glass sedimentation cylinders. 4. 13 one litre glass beakers & covering watch glasses. 5. Suction pump. 6. 13 one litre PVC bottles 7. Two splash bottles 8. Rubber policeman 3 cm 9. 20ml pipetting device, 10. 4x13 Stainless steel moisture tins and with all other necessary accessories.	Determines fine particle size distribution (clay/silt) using sedimentation. Applicable for soils with high fines content.
28.	Shrinkage Limit test apparatus	**Shrinkage Limit test apparatus[IS 2720 (part VI)-1972]** • Porcelain evaporating Dish • Shrinkage Dish • Glass Cup • Perspex plate with three metal prongs • Perspex plate, plain • Flexible Spatula • Glass Cylinder 25 ml x 0.5ml and with all other necessary accessories.	Determines fine particle size distribution (clay/silt) using sedimentation. Applicable for soils with high fines content.
29.	Plastic Limit test apparatus	**Plastic Limit test apparatus [IS 2720 (part V)-1985]** The complete set consists of: • Glass plate 20cm x 15cm having ground ends and one side frosted. • Brass or stainless steel rod 3 mm	Determines plastic limit of cohesive soils. Helps classify soil plasticity and behaviour.

		dia. x 150 mm long, • Flexible spatula. • Porcelain basin And with all other necessary accessories.	
30.	Liquid Limit test apparatus	**Liquid Limit test apparatus[IS 2720 (part V)-1985]** Casagrande's apparatus with all necessary accessories (like grooving tool, Mixing dishes, spatula etc.)	Measures liquid limit using Casagrande method. Assesses consistency and classification of fine soils.
31.	Field density test by Sand replacement method	**Field density test by Sand replacement method [IS 2720 (Part XXVIII)- 1974]** : Sand pouring cylinder of 3 litre capacity, mounted above a pouring cone and separated by a shutter cover plate. Cylindrical calibrating container with an internal diameter of 100 mm and an internal depth of 150 mm fitted with a flange 50 mm wide and about 5 mm surrounding the open end. Metal tray with 300 mm square and 40 mm deep with a 100 mm diameter hole in the centre.	Determines in-situ density of compacted soil. Used for field compaction control.
32.	Field density test by Core cutter method	**Field density test by Core cutter method [IS 2720 (part XXIX)-1975]:** • Core cutter apparatus with dolley. • Rammer for above with handle.	Measures in-situ density of cohesive soils. Suitable for fine-grained and soft soils.
33.	Permeability Apparatus	**Permeability Apparatus as per IS 2720 (P-XXXVI)-1987:** **For Determination of co- efficient of permeability by Constant head parameter & variable head parameter.** Consisting of gunmetal / brass mould 100mm dia. x 127.3mm height x 1000ml volume with collar and Drainage base plate, drainage cap, Metallic clamping ring, two porous stone for base and cap. Dummy plate, set of three glass stand pipes approx. 6mm×10mm, and 20mm dia, mounted on a wooden board, length of 3 meter rubber connection tube with pinch cock. And also with 100 litre water tank having with an inlet port at the top, six outlets at the bottom with cocks, air inlet and water filling tube at the top. An arrangement to indicate the water level is also provided. And inlet port on top and with all other necessary accessories.	Measures coefficient of permeability of soils. Used for groundwater flow and drainage design.
34.	Compaction test	**Compaction test apparatus(standard Proctor Test) as per IS 2720 (Part VII)-1980-**	Determines optimum moisture content and maximum dry density.

	apparatus(standard Proctor Test)	Standard Proctor Compaction mould, 100mm dia x 127. 3 mm high x 1000 c.c. volume with collar and base plate. Light compaction, made of Mild Steel. With Rammer 2.6 Kg. x 31 cm. controlled drop.	Fundamental for earthworks and embankment compaction.
35.	Compaction test apparatus(Modified Proctor Test)	**Compaction test apparatus(Modified Proctor Test) as per IS 2720 (Part VIII)-1983-** Modified Proctor compaction mould, 150mm dia x 127.3mm high x 2250 c.c. volume with collar and base plate. For Heavy Compaction, made of Mild Steel. With Rammer 4.89 Kg. x 45 cm. controlled drop.	Similar to standard test but simulates heavier compaction. Used for highways and airfields with high load requirements.
36.	**Laboratory vane shear test apparatus**	**Laboratory vane shear test apparatus motorised electrically operated rate of rotation is 1/ 60 r.p.m as per IS 2720 (Part XXX)-1980:** Consists of a torque head adjustable in height by means of a lead screw rotated by a drive wheel to enable the vane to be lowered into the specimen. Rotation of the vane is operates a worm gear arrangement turning the upper end of a calibrated torsion spring vane dia rod dia, vane size & vane height are as per IS specification. The vane shaft is attached through the hollow upper shaft to resettable pointer, which indicates the angle of torque on a dial graduated in degrees. The dial reading multiplied by spring factory gives the torque. A container for soil sample is also supplied, and a sampling tube of 38mm I.D. & 150 mm long can also be used as container. With set of four springs, one each of approx 2kg cm, 6kg cm, and 8kg cm. Complete as above in a wooden carrying case with all other necessary accessories.	Evaluates undrained shear strength of cohesive soils. Commonly used for soft clays and quick field assessment.
37.	Universal soil sample extruder Electronic cum hand operated:	**Universal soil sample extruder Electronic cum hand operated:** • Power pack with quick release couplings. • Manual operation possible on power failure. • Ejects soil from sampling tubes and moulds upto 60 cm in length and 38 to 150 mm in diameter by a single operation. • Allows direct transfer of soil from field sampling tubes, Proctor and CBR moulds	Extracts soil samples from moulds/tubes with minimal disturbance. Prepares samples for triaxial, CBR, or consolidation tests.

38.	GI Tray	**GI Tray** (300x300) mm2 **GI Tray** (450x600) mm2	Holds soil samples during processing or drying. Used as a utility tray in lab work.
39.	APPARATUS FOR STANDARD PENETRATION TEST	**SPT equipment consists of the followings and confirming to IS: 2131:1981, IS:9640:1980** 1) Spit Spoon Sampler- 50.8mm OD and 38mm ID confirming to IS 9640: 1980 2) Spit Spoon Sampler with Brass liner, 50.8mm OD and 35mm ID 3) Driving weight – cast iron, 63.5 kg, 78mm bore ID approximately 4) Guide pipe assembly- Bore 73mm OD approximately 5) Tripod with Pulley and built in ladder 6) 'A' type Drill Rods -10m long 7) Hoisting equipment-Lifting Bail, Tongs, Rope, Screw Jack, pulley, hook, axle, winch etc. 8) Manila Rope 19mm dia, 10m long 9) Mechanically operated driving mechanism * One set consist of all the above items	Determines relative density and strength of in-situ soils. Widely used in site investigation for foundations.
40.	APPARATUS FOR CONE PENETRATION TEST (CPT)	Static Cone Penetrometer machine (capacity 200kN, **Engine driven**) with all its accessories complete set and **confirming to IS: 4968 (Part 3):1976** for 30m depth. Digital display for load and displacement. Major accessories are as given below. 1) Penetration cone (steel, 60° cone angle, 10 cm2 base area) 2) Friction jacket 3) Mantle Tube with sounding rod (1m working length) 4) Load cell with digital indicator 5)Hyd. Motorized Anchor driving Assembly 6) Driving mechanism 7) Sounding rod etc. 8) Anchors etc. * One set consist of all the above items	
41.	APPARATUS FOR SWELLING PRESSURE TEST	Apparatus consist of the followings and Confirming to **IS: 2720 (Part 4)-1985** 1) Pippete (10 ml capacity, Anderson) with stand 2) Cylinder/jars(500,1000 ml capacity, glass) 3) Mechanical stirrer -(High speed>8000rpm) 4) Glass weighing bottles of 15 ml capacity fitted with ground glass stopper.	Measures pressure exerted by expansive soils when soaked. Critical for foundation design in swelling soil areas.

		5) Digital Balance- (sensitivity 0.001gm.) of nearly 320g capacity 7) Thermometer (0 to 50°C) 8) Water bath - of 15lit to 20lit capacity	
42.	APPARATUS FOR SEDIMENTATION ANALYSIS USING PIPPETTE METHOD FOR CLAY AND SILT.	Apparatus consist of the followings and Confirming to IS: 2720 (Part 4)-1985 1) Pippete (10 ml capacity, Anderson) with stand 2) Cylinder/jars(500,1000 ml capacity, glass) 3) Mechanical stirrer -(High speed>8000rpm) 4) Glass weighing bottles of 15 ml capacity fitted with ground glass stopper. 5) Digital Balance- (sensitivity 0.001gm.) of nearly 320g capacity 7) Thermometer (0 to 50°C) 8) Water bath - of 15lit to 20lit capacity	Determines grain size distribution using pipette method. Used for fine-grained soil classification.
43.	DISTURBED & UNDISTURBED SAMPLERS	i)Open tube sampler and split tube sampler (ii)Thin walled tubes 50 to 125 mm (iii)Piston type sampler (iv)Samplers with special core retainers (v)Sand sampler Confirming to respective IS codes.	Collect soil samples from field for lab testing. Preserve structure for strength and consolidation tests.
44.	APPARATUS FOR RELATIVE DENSITY	Apparatus consists of the followings and confirms to **IS: 2720 (Part 14)-1983** Vibratory table of size 75cm x 75cm. Vibration rate should be 3600 VPM (3000 @ 50 Hz) vibratory table, minute under a 11.5kg load. Amplitude is variable in between 0.65mm in step of 0.05 to 0.25mm, 0.25 to 0.45 mm and 0.45 to 0.65mm, Suitable for operations on 415V, Three Phase supply. Cylindrical metal mould, 3000ml. Capacity. Guide sleeve with clamp assembly. Surcharges base plate for mould. Handle for surcharge base plate. Surcharge weight. Cylindrical metal mould 15000 ml. capacity. (Total weight together with the above mould & surcharge weight is equivalent to 140 kg./sq. cm) Dial gauge 0.01mm x 50mm travel. Extension piece 25mm for dial gauge.	Measures maximum and minimum density of granular soils. Used to assess the compaction quality of sands and gravels.
45.	APPARATUS FOR AUGER BORING	Auger (Spiral type) confirming to **IS: 10442:1983.** Nominal size-**100mm, 150mm, 300mm** with extension rods, Couplers, T piece, handles and extension to handles etc. in complete for boring up to 10m.	Drills shallow boreholes for soil sampling. Common in preliminary geotechnical investigations.

46.	Universal Automatic Compactor	Universal Automatic Compactor with Mild Steel compaction mould Ref Standard IS:2720 (Part 7 & 8)	Automates compaction of soil for standard and modified Proctor tests. Increases consistency and efficiency.
47.	Soil Trimmer (Motorised)	**Technical Specification:** For preparation of undisturbed samples varying from 38 to 100 mm dia of different dimensions for triaxial tests. The equipment should be supplied along with 38, 50, 75 and 100 mm dia specimen rings (1 no. of each) and a hardened steel trimming knife. Suitable for 220 V, 50 Hz, Single phase supply.	Prepares cylindrical soil specimens for triaxial testing. Ensures precise dimensions with minimal disturbance.

Budget Requirement:

Facility	Approximate Cost (INR)
Geotechnical Laboratory	1.25 crore

Equipment: Engineering Geology and Rock Mechanics-3

S. No.	Equipment	Specification	Application
1.	Rock Core Drilling Machine	Standards: ASTM D2113, IS 4464 Core diameter: 12 - 300 mm Speeds: 230 / 500 / 1 030 RPM, variable Axial stroke: ≥ 400 mm Motor: ≥ 1.5 kW, hydraulic feed Core bit: Diamond/tungsten-carbide with reaming shell Cooling: Closed-loop water circulation Frame: Rigid pillar & rack-&-pinion mechanism; anti-vibration base	Used to extract cylindrical rock cores from boreholes for physical and mechanical testing. Helps in identifying geological strata and discontinuities during geotechnical investigations. Essential for sampling in mineral exploration, foundation design, and dam site assessment
2.	Permeability Test(Rock)	IS 4348-1973; ASTM-equivalent Core size: 38–100 mm dia × up to 100 mm length Test modes: Falling head, constant head; dual packer options for confined samples Pressure range: Up to 10 MPa; digital pressure transducers Flow measurement: Graduated tube ±0.1 ml; precision valves	Determines the permeability of rock specimens to assess groundwater flow and seepage. Used in the design and safety analysis of dams, tunnels, and underground structures. Helps evaluate the suitability of rock formations for waste disposal and storage of fluids.

		Cell assembly: Non-corrosive stainless steel with sealed end caps	
3.	Point Load Test	Capacity: 0–100 kN with dual gauges (0–25 kN and 0–100 kN) Platens: Hardened conical mandrels; specimen sizes EX up to 100 mm Frame: Rigid steel column with hydraulic ram Accessories: Distance measuring scale with least count 1 mm	Provides a quick estimate of uniaxial compressive strength (UCS) of rock samples. Used for classifying rock strength in the field or laboratory, especially when core quality is poor. Supports rock mass classification systems like RMR and Q-system for slope and tunnel design.
4.	Brazilian Tensile Test	Sample size: 50–100 mm diameter, L/D ≈ 0.5 Load frame: Hydraulic UTM; capacity 100–1000 kN Jaws: Curved or flat steel surfaces for uniform loading Rate of loading: 0.5–1.0 MPa/min Data output: Load–displacement curve capture; digital gauges	Determines the indirect tensile strength of rocks using disc-shaped specimens. Critical for evaluating tensile failure potential in slopes, tunnels, and foundations. Supports numerical modeling and failure criteria validation in rock mechanics research.
5.	Core Cutting and Grinding Machine	Cutting Section: Blade: Diamond disc, Ø 200–350 mm, water-cooled	Prepares rock core specimens with flat and parallel surfaces for mechanical tests.

		Motor: ≥ 1.5 HP Vertical stroke: Rack & pinion controlled Vice: Rigid adjustable clamping Grinding/Polishing Section: Wheel: Diamond grinding/polishing disc Motor: ≥ 1 HP Specimen flatness: ≤ 0.02 mm Cooling: Water-circulation system Holder: Table mount with fine movement control	Ensures specimen geometry complies with standards for UCS, triaxial, and tensile testing. Used in academic and industrial labs for precision cutting and surface finishing of samples.

Budget Requirement:

Facility	Approximate Cost (INR)
Geotechnical Laboratory	50 lakhs

State of the art equipment for seismic and subsidence studies-4

S. No.	Equipment	Specifications	Applications
1.	Shake Table	The shake table platform is a pyramidal structure with a flat top of 3.5 m X 3.5 m driven by three actuators: one horizontal and two vertical. Specification: 1. Thrust (i) Static — Horizontal Actuator 250kN, Vertical Actuator 150kN; (ii) Dynamic — 200kN, 100kN 2. Stroke — +/- 150 mm, +/- 150 mm 3. Velocity — 1000 mm/sec, 1000 mm/sec	• Seismic Performance Testing • Retrofitting and strengthening Technique
2.	Drone for Surveying and Mapping	Drone technologies, for **field surveying and mapping** has revolutionized civil engineering, land development, mining, and agriculture. They provide high-resolution data faster, more safely, and more cost-effectively than traditional methods. Platform Type: Multirotor/Fixed Wings/Hybrid VTOL Sensor Payloads: RGB Camera, LiDAR Flight Time: 25-60 min (multirotor), 60-80 min (Fixed wings) Flight Altitude: up to 120 m AGL (per regulation) Accuracy (with RTK): Horizontal: ±1–3 cm, Vertical: ±3–5 cm Output & Processing : Data Type — Description Orthomosaic Map — 2D stitched image (geo-referenced) DSM/DTM — Surface and terrain elevation models Point Cloud — Dense 3D data (from photogrammetry or LiDAR)	• **Land mapping and surveying** • **Infrustructure monitoring** • **Environmental monitoring** • **Urban planning**

		Contours	Generated from DTM/DSM	
		Volume Calculations	Earthwork, stockpile analysis	
3.	Rainfall Simulator	**A Rainfall Simulator** is a controlled device used to replicate natural rain in a laboratory or field environment for the purpose of **studying hydrological, agricultural, environmental, and soil erosion processes.** A) General Specification: 1) Rainfall Simulator should have Spray nozzles to simulate rain, assembly supported by metallic frame on upper end. 2) It should be adjustable in width and length with the variable study plot size. Width of the simulator should be in the range of 3 to 10 m. 3) Length should be adjustable in range of 5 to 15 m. 4) The simulator should have tilting and adjustable facility (Adjustable nozzle height). The height can vary from 2 to 5 m. 5) Each nozzle should be fitted with control valve and pressure gauge excluding main control valve and pressure gauge near the pump outlet. 6) Flow meter at the pump outlet to measure the outflow discharge from pump 7) Connecting pipes should be of best quality (wear and tear free, corrosion free) sufficient length to accommodate with variable simulator frame size. 8) The connection pipes should be fitted so as to avoid any kind of sagging or pressure loss during conveyance. B) Nozzle Specification: 1) Full Jet Spray Nozzle (Full Cone) 2) Nozzle inlet connection. Female NPT 3) Capacity of nozzle to simulate rainfall should be in the range of 20 mm/hr to 250 mm//hr (20 lit/min to 200 lit/min) 4) Drop size distribution should be uniform for the entire study plot area.	• **For scientific study on rainfall characteristics, Soil erosion, Soil loss and sediment yield under simulated rainfall condition.** • **Practical purposes.** • **Data generation on rainfall – runoff - Soil erosion – Soil loss parameters for different Soil conditions.**

		5) Size of drops generated by nozzle should be nearly same as of natural rainstorms. 6) Nozzle attachment fixtures should be like that so as to accommodate other types of nozzles also. Spray Angle should not be less than 85 degrees. 7) Maximum PSI 10 C) Pump Specification: 1) Capacity: Max. 200 lit per min. 2) Power Rating Single Phase: 1HP	
4.	Slope Simulator	A Slope Simulator is an experimental setup used primarily in geotechnical engineering and earth science to study the behaviour of slopes under various physical conditions, such as rainfall, loading, seismic activity, and soil saturation. **Parameter** — **Typical Specification** Slope Angle (Adjustable) — 0° to 45° or more (motorized or manual tilt) Bed Size (Test Area) — Lab-scale: 1–2 m long × 0.5–1.5 m wide × m deep Soil Container — Transparent plexiglass/acrylic or steel side walls for visualization Inclination Mechanism — Electric actuator or hydraulic jack with inclinometer for angle control Instrumentation — - Pore pressure transducers - Soil moisture sensors - Displacement sensors (LVDTs) - Load cells Rainfall Simulation — Integrated or external system with variable rainfall intensities (10–150 mm/hr) Data Logging System — Multichannel DAQ with real-time visualiza and storage Base Drainage System — Gravel + geotextile filter layer; drainage po	• Landslide and Slope Failure Analysis • Rainfall-Induced Instability • Seepage and Pore Pressure Studies • Soil Reinforcement & Stabilization

		Materials Tested	Sand, clay, silt, gravels, or layered soils	
		Power Supply	220–240V AC (for motorized slope and instrumentation	

Budget Requirement:

Facility	Approximate Cost (INR)
Geotechnical Laboratory	1.50 crore

Software for Disaster Related Research

S. No.	Software	Specifications	Application
1.	PLAXIS 2D	• Perpetual License • 3-Years of Select Subscription • Can generate sequence of construction • Can model problems related to geotechnical engineering, such as, soil-structure interaction, groundwater flow, dynamic load modelling, among others • Supports wide range of soil material models, including but not limited to, Hardening models, soft soil models, MC model, Hock-Brown model, jointed rock models, among others • Supports plastic calculations, consolidation analysis, safety analysis, and dynamic analysis • Can generate results for structural forces, load, deformation, stress, strain, plastic and tension points (failure points) • The results can be visualized in the forms contour plots, shading, iso-surface, and vector plots	Analysis of soil-structure interaction in foundations, retaining walls, tunnels. Seepage and groundwater flow modelling for slopes and excavations. Dynamic loading analysis for earthquake response of geotechnical systems.
2.	PLAXIS 3D Suite Classroom perpetual License with 3 Years of Select Subscription	• Perpetual License • 3 Years of Select Subscription • Can generate sequence of construction. • Can model problems related to geotechnical engineering, such as, soil-structure interaction, groundwater flow, dynamic load modelling, among others. • Supports wide range of soil material models,	3D simulation of deep foundations and pile groups. Modeling of complex tunnel geometry and construction sequences. 3D dynamic response of soil-structure systems during earthquakes.

		including but not limited to, Hardening models, soft soil models, MC model, Hock-Brown model, jointed rock models among others. • Supports plastic calculations, consolidation analysis, safety analysis, and dynamic analysis. • Can generate results for structural forces, load, deformation, stress, strain, plastic and tension points (failure points) • The results can be visualized in the forms contour plots, shading, iso-surface, and vector plots.	
3.	GeoStudio 2D	Numerical analysis tools for two-dimensional simulating conditions at and below the ground surface. From natural soil and rock slopes to dewatering systems or tailings storage facilities to model the conditions needed for better insights into geotechnical projects. The GeoStudio 2D software should include the following modules: i. SLOPE/W Limit equilibrium slope stability software for soil and rock slopes, effectively analysing both simple and complex problems for various slip surface shapes, pore water pressure conditions, soil properties, and loading conditions. Analyze almost any slope stability problem that can be encountered in geotechnical, civil, and mining engineering projects. ii. SEEP/W Finite element software product for modelling groundwater flow in porous media. Model simple saturated steady-state problems or sophisticated saturated/unsaturated transient analyses with	Slope stability analysis using SLOPE/W for both simple and complex geometries. Groundwater seepage analysis with SEEP/W for earth dams or excavations. Earthquake-induced liquefaction studies using QUAKE/W.

		atmospheric coupling at the ground surface. iii. SIGMA/W Finite element software product for modelling stress and deformation in soil, rock, and structures. Analyses may range from simple linear elastic simulations to soil-structure interaction problems with nonlinear material models. iv. CTRAN/W Finite element software product for modelling solute and gas transfer in porous media. To model simple diffusion-dominated systems through to complex advection-dispersion systems with firstorder reactions. Model a vast array of geo-environmental problems involving the movement of dissolved species or gases that originate from either man-made or naturally occurring sources. v. AIR/W Finite element software product for modelling air transfer in mine waste and other porous media. To model various scenarios, from simple single-phase air transfer problems to complex coupled air-water systems. It can be coupled with TEMP/W to model forced-convection heat flow and density-dependent airflow. For studying mine closure, acid rock drainage, or gas transfer. vi. QUAKE/W Finite element software product for modelling earthquake liquefaction and dynamic loading. Determine the motion and excess pore water pressures arising from earthquake shaking, blasts, or sudden impact loads. vii. TEMP/W	

		Finite element software product for modelling heat transfer and phase change in porous media. Analyze simple conduction problems to complex surface energy simulations with cyclical freeze-thaw.	
4.	GeoStudio 3D	Numerical analysis tools for three-dimensional simulating conditions at and below the ground surface. From natural soil and rock slopes to dewatering systems or tailings storage facilities to model the conditions needed for better insights into geotechnical projects. The GeoStudio 3D software should include the following modules: i. SLOPE3D Limit equilibrium capabilities by offering a practical and sophisticated approach for capturing 3D slope failure mechanisms in both soil and rock, given various slip surface shapes, pore water pressure conditions and soil properties. ii. SEEP3D Finite element software product for modelling 3D groundwater flow in porous media. Model simple saturated steady-state problems or sophisticated saturated/unsaturated transient analyses using the same comprehensive set of material models and boundary conditions as SEEP/W. iii. TEMP3D Analyze 3D heat transfer using the same comprehensive set of material models and boundary conditions as TEMP/W. iv. AIR3D Finite element software product for modelling three-dimensional air transfer in mine waste and	3D slope stability and failure surface modeling using SLOPE3D. 3D groundwater and contaminant transport modeling with SEEP3D and CTRAN3D. 3D heat and air flow simulations in waste rock piles (TEMP3D + AIR3D).

		other porous media. To model various scenarios, from simple single-phase air transfer problems to complex coupled air-water systems. It can be coupled with TEMP3D to model forced-convection heat flow and density-dependent airflow. For studying mine closure, acid rock drainage, or gas transfer. v. CTRAN3D Finite element software product for modelling 3D solute and gas transfer in porous media. To model simple diffusion-dominated systems through to complex advection-dispersion systems with first-order reactions. Model a vast array of geo-environmental problems involving the movement of dissolved species or gases that originate from either man-made or naturally occurring sources.	
5.	Geomatics Software (Recommended ArcGIS Desktop Advanced)	ArcGIS Pro is the future of Esri's desktop GIS, with powerful 3D support, cloud integration, and a modern UI, because ArcGIS Desktop retires in 2026. Esri recommends migrating to ArcGIS Pro for long-term projects. • Processing of popular vector and raster formats • Advanced tools to manage and analyze imagery at different resolutions. ArcGIS Pro 3.5 system requirements CPU: Recommended: 4 cores Optimal 10 cores **Storage:** Recommended: 32 GB or more of free space on a solid-state drive (SSD) **Memory/RAM:** 64 GB or more	GIS-based spatial data analysis for infrastructure and site selection. Creation of detailed 2D and 3D maps for urban planning or hazard mapping. Remote sensing and image analysis for environmental or terrain studies. Tools for storing, editing, evaluating, and managing all kinds of spatial data-- including real-time and big data.

		Screen resolution: Recommended: 1080p or higher Higher resolutions, such as 4K, require more video memory and a more powerful GPU.	
6.	Building Information Modeling (BIM)	Building Information Modeling (BIM) software is used to create and manage digital representations of physical and functional characteristics of a building or infrastructure project. It's a process that integrates multi-disciplinary data to produce a digital representation of an asset throughout its lifecycle, from planning and design to construction and operations. **AutoCAD** **Autodesk Revit** **BIM 360** **Civil 3D**	Tools used in the architecture, engineering, and construction (AEC) industries to create and manage digital representations of physical and functional characteristics of a building or infrastructure project. These applications enable users to visualize, design, and analyze projects in 3D, facilitating better collaboration, coordination, and informed decision-making throughout the project lifecycle.

Budget Required

S. No.	Software	Approximate Cost (INR)
1.	PLAXIS 2D	7.5 lakhs
2.	PLAXIS 3D Suite Classroom perpetual License with 3 Years of Select Subscription	20 lakhs
3.	GeoStudio 2D	5 lakhs
4.	GeoStudio 3D	7.5 lakhs
5.	Geomatics Software (Recommended ArcGIS Pro) (3 years licence)	5 lakh
6.	Building Information Modeling (BIM) AutoCad (annual) Autodesk Revit (annual) Civil 3D BIM 360 (3 year)	 1.22 lakh 1.75 lakh 1.70 lakh 2 lakh
7	SNAIL	8.33 lakhs
8	Abacus	10 lakhs
Total cost		70 Lakhs

DEPARTMENT OF MATHEMATICS & STATISTICS
HIMACHAL PRADESH UNIVERSITY,
SHIMLA-171005

On Spot ~~11~~ 11

Item: To place before the Academic Council of Himachal Pradesh University scheduled to be held on 01-07-2025, the matter regarding the approval of **"Ramanujan Centre for IKS and Indian Mathematics"**.

Explanatory Note:

The standing committee of Academic Council in its meeting held on 17th September, 2021 approved the establishment of "Centre for Indian Mathematics" in the Department of Mathematics & Statistics, Himachal Pradesh University, under the organizational framework of Himachal Pradesh University which was subsequently approved by the Executive Council in its meeting held on 4th December, 2021 vide item No. 15, (copy attached)

Further, the Executive Council in its meeting held on 30-05-2022 (copy attached), approved the change in the name of centre as "Ramanujan Centre for Indian Mathematics". The Ramanujan Centre for Indian Mathematics was established with the vision to promote research and education in Indian Mathematical traditions and their relevance to contemporary mathematical studies. In this centre, the following activities are organized to promote Indian Mathematics:

1. One year Post graduate Diploma in Ancient Indian Mathematics
2. Six months Certificate course in Vedic Mathematics
3. Seminars, Guest Lectures and Workshops on Indian Mathematics.

In view of the National Education Policy (NEP) 2020 and as per the mandate of MERU, which lays a strong emphasis on the promotion and integration of Indian Knowledge Systems (IKS) in higher education, Hon'ble Vice Chancellor has desired to expand the scope and identity of the existing Centre by establishing it as the "Ramanujan Centre for IKS and Indian Mathematics."

All the posts (teaching/ non-teaching), Courses, Curriculum would remain same as those of the existing centre. In addition to that Seminars, Workshops and Awareness Camps related to IKS will also be organized by the centre. All the relevant documents are attached herewith.

The matter may please be placed in the Academic Council meeting proposed to be held on 01-07-2025, for its consideration and approval.

Points for Consideration:

To consider and approve the matter related to establishment of **Ramanujan Centre for IKS and Indian Mathematics"** in place of **"Ramanujan Centre for Indian Mathematics"** which shall facilitate the Department to apply & fetch more funds & grants from various funding agencies of the State and Central Government.

Item No. 2. **To place before the Faculty of Physical Sciences to consider and approve common format for UG courses under NEP.**

Decision - After the detailed discussion and deliberation, the members of Faculty of Physical Sciences were of the opinion that NEP (UG level) under Physical Sciences faculty should be a separate format for the science specific subjects / courses.

Item No. 3. **To place before the Faculty of Physical Sciences for consideration and approval the request of Chairman, Department of Data Science & Artificial Intelligence made vide letter No. HPU-DSAI-722 dated 30.7.2024 to treat the add-on course duration as six months instead of four months.**

Decision - The Faculty of Physical Sciences after discussion & deliberation approved the change/correction in the duration of the following addeon courses to six months instead of four months, earlier approved due to typographical mistake:

a. Introduction to Ethical Hacking;
b. Indian Knowledge System; and,
c. Responsible Artificial Intelligence.

The meeting ended with the vote of thanks to the chair.

(Aarti Manglesh)

(Rajesh Kumar)

(Sumesh Sood)

(Pushap Lata)

(Sandeep Chauhan)

(Shyam Chandl

(Pradeep Kumar)

(Hari Mohan)

(Baljit Singh)

(Anita Ganpati)

(Jayanthar Thakur)

(Jyoti Prakash)

(Khem Chandl)

(Rambir Sharma)

(Kishori Lal Bansal)

(Vir Singh)

(Nainjeet Singh)

(Manu Sood)

(Arvind Kalia)

(Ramesh Kumar Sharma)
Secretary

(A. J Singh)
Dean of Faculty Physical Sciences

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मद संख्या 12: Request of Dr. Anurag Sharma (Retired) Deptt. of Geography to retain the University residential accommodation i.e. Set No. 3A, (Type-IV) Shivalik House in Teachers Colony upto March, 2023

The Council discussed the matter in detail and approved to retain the University residential accommodation i.e. Set No. 3A, (Type-IV) Shivalik House in Teachers Colony by Dr. Anurag Sharma (Retired) Deptt. of Geography upto 31.03.2023, if he is ready to pay penal rent as per Govt. rates and in future this may not be quoted as precedent. The council also decided that no further extension will be granted.

मद संख्या 13: The matter with regard to charging of late fee in different slabs after the last date of depositing admission/ course fee in various Under Graduate, Post Graduate and Diploma Courses run through ICDEOL

(i) Late fee for 1st fortnight after the last date is over - Rs. 500/-
(ii) Late fee for next fortnight - Rs. 1000/-
(iii) Thereafter late fee with the approval of Vice-Chancellor (15 days before the commencement of Examinations) - Rs.-1500

The Council after detailed deliberations in the matter approved that the late fee for UG, PG and diploma courses be charged from academic session 2021-22 according to point No. (i) to (iii). Further, the Council directed to charge the late fee according to point No. (i) and (ii) from academic session 2022-23 onwards.

C Proceeding
10S/2022

मद संख्या 14: The matter regarding change of name from approved name "Centre for Indian Mathematics" to Ramanujan Centre for Indian Mathematics.

The Council approved the proposal with the same terms and conditions as earlier approved. The case may be submitted in the Finance Committee with new offered name.

अनुपूरक मदें:-

मद संख्या-1: Regarding deletion of Ordinance No. 31.1(A)(iv) of Himachal Pradesh University Ordinance Vol.I – Migration of students.

The Council approved the proposal.

Amended.

मद संख्या-2: Regarding recommendations of the committee constituted by the Executive Council to examine the veracity of the complaint received from the Chief Electoral Officer regarding involvement of University Teachers in political activities during the conduct of 2019 General Lok Sabha Election.

The Council after detailed deliberations in the matter and perusal of the recommendations of the committee, approved that no case of violation of model code of conduct which is punishable under the provisions of conduct rules is made out against any teacher implicated in the complaint.

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-231-

(4)

BA/B.Sc
MA/M.Sc

Faculty: Physical Sciences

Dean of the Faculty: Prof. A.J. Singh

Item No. **To place before the Standing Committee, the recommendations of the Faculty of Physical Sciences dated 30.07.2024 for consideration and approval.**

(Brief Note: The meeting of the Faculty of Physical Sciences under the Chairmanship of Dean Faculty of Physical Sciences held on 30.07.2024. The Faculty vide item No.1, on the recommendations of the concerned Board of Studies, considered and approved the syllabus of two add on courses in the Department of Mathematics and Statistics from the academic session 2024-25; namely (1) Certificate Course in Vedic Mathematics and (2) Post Graduate Diploma in Ancient Indian Mathematics, as per **Annexure-A.**

Therefore, the above syllabi are placed before the Academic Council / Standing Committee of Academic Council for consideration, approval and such decision as it may deem fit).

POINTS FOR CONSIDERATION:

To consider and approve the recommendations of the Faculty of Physical Sciences dated 30.07.2024 alongwith syllabi of studies in two add on courses for implementation from the Academic Session 2024-25 as per Annexure A.

14/8/24

irman
artment of Mathematics & Statistics
University, Shimla-171005

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(5)

Himachal Pradesh University

NAAC Accredited "A" Grade University
Faculty of Physical Sciences

Dated: Shimla-5, the 12.8.2024

The proceedings of meeting of Faculty of Physical Sciences, constituted vide Notification No. 1-86/95-HPU (Genl.) dated 11th June 2024, which was held on 30.7.2024, under the Chairmanship of Prof. A.J. Singh, Dean, Faculty of Physical Sciences. The recommendations of the Faculty of Physical Sciences is to be placed before the Standing Committee of the Academic Council. Accordingly, draft item is prepared and submitted for kind approval by the Hon'ble Vice-Chancellor, so that the same could be sent for further placing in the Standing Committee of the Academic Council/ Academic Council by the Deputy Registrar (Academic), Please.

Deputy Registrar (ICDEOL)-cum-
Secretary, Faculty of Physical Sciences

Dean
Faculty of Physical Sciences A.J. Singh

HPU-CSD-1547
14/8/2024 D.S.

SG-DS
14/8/24

The proceedings of faculty of Physical Sc. to start two add on Courses in certificate diploma in Deptt. of Mathematics from the session 2024-25 may be approved. The action taken report will be placed in next standing committee of Academic Council for ratification.

14.8.24

कुलपति कार्यालय
संख्या 2410
16/08/24
हि० प्र० विश्वविद्यालय, शिमला-5

Hon'ble V.C.

16/08

Hon'ble Vice-Chancellor

The above matter was placed before the Hon'ble Vice-Chancellor through "On-line Mode" for seeking his orders in the matter and accordingly, he has passed the following orders:-

हिमाचल प्रदेश विश्वविद्यालय
(कुलपति कार्यालय)
प्राप्ती नं. 4298
दिनांक 17/08/24

"नियमानुसार ही कार्यवाही की अनुमति है।"

Therefore, as per the above orders of the Hon'ble Vice-Chancellor, further necessary action in the matter may please be taken.

Secretary to Vice-Chancellor

D.S. (Acad.)

Proceeding of the Meeting of Faculty of Physical Sciences

Dated 30.07.2024

A meeting of the Faculty of Physical Sciences held on 30.07.2024 at 3:30 PM in the Library Room of the Department of Chemistry, Himachal Pradesh University, Shimla. The following members were present:

1	Prof. A.J. Singh, Dept. of Computer Science & Dean of Faculty	-Chairman
2	Prof. Arvind Kalia, Dept. of Computer Science	-Member
3	Prof. Manu Sood, Chairman, Dept. of Data Science & Artificial Intelligence	-Member
4	Prof. Nainjeet Singh, Dept. of Physics	-Member
5	Prof. Vir Singh, Dept. of Physics	-Member
6	Prof. Kishori Lal Bansal, Dept. of Computer Science	-Member
7	Prof. Raman Sharma, Chairman, Dept. of Physics	-Member
8	Prof. Khem Chand, Dept. of Mathematics	-Member
9	Prof. Jyoti Prakash, Chairman, Dept. of Mathematics	-Member
10	Prof. Jawahar Thakur, Dept. of Computer Science	-Member
11	Prof. Anita Ganpati, Chairperson, Dept. of Computer Science	-Member
12	Prof. Baljeet Singh, Dept. of Chemistry	-Member
13	Prof. Hari Mohan, Dept. of Mathematics, ICDEOL	-Member
14	Prof. Pradeep Kumar, Dept. of Mathematics, ICDEOL	-Member
15	Dr. Shyam Chand, UIT	-Member
16	Dr. Sandeep Chauhan, Chairman, Dept. of Chemistry	-Member
17	Dr. Pushap Lata, Dept. of Mathematics	-Member
18	Dr. Sumesh Sood, Dept. of Computer Science	-Member
19	Dr. Rajesh Kumar, Dept. of Chemistry	-Member
20	Dr. Aarti Manglesh, Dept. of Mathematics, ICDEOL	-Member
21	Ramesh Kumar Sharma, Deputy Registrar, ICDEOL	-Secretary

At the outset, the Dean, Faculty of Physical Sciences welcomed the members in the meeting and invited them to take up the following agenda item wise:

Item No 1: - **To place before the Faculty the proposals to start two add on courses in the Department of Mathematics & Statistics w.e.f. session 2024-25**

Decision: - Two add on courses proposed/ recommended by the Board of Studies in Mathematics (PG) in the meeting held on 10.6.2024(**Annexure-A**); namely (1) Certificate Course in Vedic Mathematics (2) Post Graduate Diploma in Ancient Indian Mathematics were approved by the faculty to be started w.e.f. session 2024-25. The faculty further recommended the same for consideration/ approval by the Academic Council/Standing Committee of Academic Council.

पद संख्या–13: To place before the Executive Council the matter for extension of time period of the Advertisements No. Rectt. 21/2020 and No. Rectt. 22/2020 dated 07.12.2020 issued for filling up of teaching and non-teaching posts.

The Executive Council after detailed discussions decided to extend the time period of Advertisements No. Rectt. 21/2020 and No. Rectt. 22/2020 dated 07.12.2020 for next 6 months for filling up of teaching and non-teaching posts.

पद संख्या–14: To place before the Executive Council matter with regard to provide free Hostel accommodation to the students with disabilities w.e.f. 15.11.2021.

The Vice-Chancellor informed the Members of the Executive Council that Hon'ble Governor/ Chancellor of the University during his visit to the University on 15.11.2021 directed the University authorities to provide free Hostel facilities to the students with disabilities. Accordingly, the Executive Council approved providing of free Hostel facility to the students with disabilities with immediate effect.

अनुपूरक पदें

पद संख्या–15: To place before the Executive Council of Himachal Pradesh University regarding the Establishment of "Centre for Indian Mathematics" in the Department of Mathematics & Statistics, Himachal Pradesh University.

The Executive council approved for Establishment of Centre for Indian Mathematics in the Department of Mathematics and Statistics HP University, Shimla.

पद संख्या–16: To place the matter before Executive Council for grant of relaxation in the approved length of service for promotion to the post of Assistant Librarian in r/o Shri Rajinder Singh, Senior Professional Assistant.

The Executive Council, after detailed deliberations as per advice of the Legal Advisor of the University on the matter approved the grant of relaxation of six months in the approved length of service for promotion to the post of Assistant Librarian under the Recruitment & Promotion Rules of the University in respect of Shri Rajinder Singh, Senior Professional Assistant.

पद संख्या–17: To place before the Executive Council the matter regarding considering the NFSC/NFST candidates for admission in the Ph.D. programme as over and above seats by adding to the maximum number of students allowed as prescribed by the University Grants Commission.

The Executive Council approved the adoption of guidelines issued by the Ministry of Social Justice and Empowerment vide No. 11023/8/2019-SCD-V/NFSC dated 01.04.2020 and further notified by the University Grants Commission vide notification No. 82-44/2020(SA-III) dated 29.09.2021 for considering the NFSC/NFST candidates for admission in the Ph.D. programme over and above the seats by adding to the maximum number of students allowed/allotted as prescribed by the University Grants Commission.

Proceedings of the meeting of the Board of Studies (BoS) in the subject of Mathematics he[ld] on [illegible] at 12:00 Noon in the seminar room of Department of Mathematics & Statistics, H.P. University, Summer Hill, Shimla-5. The following members were prese[nt] in online/offline mode.

Google Meet link: [illegible]

1. Prof. Jyoti Prakash, Chairman, (Convener)
   Department of Mathematics & Statistics
2. Prof. Rakesh, (External Subject Expert member)
   Department of Mathematics,
   Centre University of Himachal Pradesh,
   Distt. Kangra
3. Prof. Satyabir Singh (External Subject Expert member)
   Department of Mathematics,
   Punjabi University, Patiala.
4. Prof. Joginder Singh Dhiman (Member)
5. Prof. Rajesh Sharma (Member)
6. Prof. Khem Chand (Member)
7. Dr. Shalini Gupta (Member)
8. Dr. Pushap Lata (Member)
9. Dr. Shweta Pathania, (Member)
   Assistant Professor,
   HPURC, Dharamshala.
10. Dr. Madhu Bala Dhadhwal (Member)

At the outset, Convener of BOS and Chairman, Department of Mathematics & Statistics welcomed the members in the meeting. Thereafter, the agenda items were put before the worthy members for discussion and decision.

Item No. 1: Formulation of syllabi of two Add-on courses (1) Certificate course in Vedic Mathematics and (2) Post graduate Diploma in Ancient Indian Mathematics for the session 2024-25 onwards.

After detailed deliberation and discussion, the BOS unanimously formulated and approved syllabi and scheme of examination of two Add-on courses (1) Certificate course in Vedic Mathematics and (2) Post graduate Diploma in Ancient Indian Mathematics for the session 2024-25 onwards as per Annexure A and B.

Decision: Approved.

The meeting ended with a vote of thanks to the Chair.

(Dr. Madhu Bala Dhadhwal) (Dr. Shweta Pathania) (Dr. Pushap Lata)

(Dr. Shalini Gupta) (Prof. Kheta Chand) (Prof. Rajesh Sharma)

(Prof. Joginder Singh Dhiman) Prof. Sargahir Singh Prof. Rakesh

Prof. Jyoti Prakash
(Chairman)

Annexure-F

F.No. 1-2025/UILS(HPU)
Office: UILS
Incharge: Director, UILS

Item No. 15 : To place before the Academic Council the recommendations of the Department Council of its meeting held on 01-07-2025 for the kind consideration and approval.

(Explanatory Note:-

It is submitted that a meeting of the Department Council was held on 01-07-2025 under the Chairmanship of the Professor Shiv [illegible] Dogra, Director, UILS with regard to start new course i.e. B.Com.LL.B. (Hons.) Five Years Integrated Course from the Academic Session 2025-26 with intake of 60 seats.

The Department Council has unanimously agreed to start the said course from the Academic Session 2025-26 for facilitating the students of the State.

The recommendations of the Department Council is placed before the Academic Council for its consideration and approval.

Point for consideration:

The recommendations of the Department Council of its meeting held on 01-07-2025 is placed before the Academic Council for its kind consideration and approval.

[illegible]

Proceeding of the meeting of Department Council of the UILS held on 01st July, 2025 at 11:30 a.m. in the office of the Director, UILS, Ava-lodge, Shimla-4 with regard to start new course i.e. B.Com.LL.B(Hons)Five Years Integrated Course in the UILS.

****

A meeting of the Department Council of UILS was held on 01st July, 2025 at 11:30 a.m. under the Chairmanship of Professor Shiv Kumar Dogra, Director, UILS, Ava-lodge, Shimla. The following members were present in the meeting:-

1.	Dr. Kusum Chauhan, Associate Professor, UILS
2.	Dr. Seema Kashyap, Associate Professor, UILS.
3.	Dr. Veena Kumari, Associate Professor, UILS.
4.	Dr. Gitanjli Thapar, Assistant Professor, UILS
5.	Dr. Sanyogita, Assistant Professor, UILS.
6.	Dr. Rectika Rana, Assistant Professor, UILS
7.	Dr. Karuna Machhan, Assistant Professor, UILS
8.	Dr. Suman Vimal, Assistant Professor, UILS
9.	Dr. Vijay Chaudhary, Assistant Professor, UILS
10.	Dr. Rekha Suman, Assistant Professor, UILS
11.	Dr. Pushpanjali Thapar, Assistant Professor, UILS
12.	Dr. Anjna Kumari, Assistant Professor, UILS
13.	Dr. Aastha Agnihotri, Assistant Professor, UILS
14.	Dr. Sangeeta Thakur, Assistant Professor, UILS

At the very outset, Professor Shiv Kumar Dogra, Director, UILS welcomed the members of Department Council in the new academic session 2025-26. Thereafter, the Director informed the members of Departmental Council that requests have been received from various corners of the State to start the B.Com. LL.B (Hons.) Five Years Integrated Course in UILS on the analogy of B.A. LL.B.(Hons.). The Director further informed that this course is also running in most of the neighboring Universities also. Therefore, the Director, place the agenda item before the Department Council of UILS for their kind consideration and its recommendations in the matter. All the Faculty Members shown their concern to the Director, UILS that the Institute has not sufficient infrastructure to start this new course till new block is to be constructed. In response, the Director informed the members that we are in process to renovate two extra rooms in the present building and initially we can start the new course B.Com.LLB(Hons.) Classes in two rooms with intake of 60 seats. The Director further informed that the committees will be constituted for framing of syllabus and Prospectus to start the new course B.Com..LL.B.(Hons.) after the approval from the competent authorities.

Thereafter, all the members of Department Council of the UILS after detailed discussions unanimously resolved and recommended that the B.Com.LL.B(Hons.) Five Years Integrated Course may be started in the UILS on the analogy of B.A.LL.B(Hons) course initially with intake of 60 seats from the academic session 2025-26.