



KERALA STATE HIGHER EDUCATION COUNCIL



REPORT

**ON THE RESTRUCTURING
OF UNDERGRADUATE
PROGRAMMES UNDER
FYUGP**



APRIL 2026

THE KERALA STATE HIGHER EDUCATION COUNCIL

**Report on the Restructuring of
Undergraduate Programmes under FYUGP**

Documentation Division

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Preface

The transformation of higher education in Kerala marks a significant step toward building a knowledge society that is globally competitive, socially responsive, and future-oriented. In this context, the restructuring of undergraduate programmes under the Four-Year Undergraduate Programme (FYUGP) represents a landmark reform initiative undertaken by the Government of Kerala, with the Kerala State Higher Education Council (KSHEC) playing a pivotal role in its conceptualization and implementation.

This report emerges from a comprehensive academic exercise aimed at re-envisioning undergraduate education in the State. Recognizing the limitations of conventional mono-disciplinary programmes in addressing contemporary challenges, the initiative seeks to introduce innovative interdisciplinary and multidisciplinary degree programmes that integrate knowledge across domains. By drawing upon global best practices and benchmarking against leading universities, the proposed programmes are designed to combine disciplinary depth with cross-functional breadth, thereby equipping students with critical thinking, creativity, and problem-solving abilities.

The report outlines a wide spectrum of restructured undergraduate programmes across Science, Humanities, Commerce, and Social Sciences, carefully curated to align with emerging academic trends and evolving labour market demands. It also presents a flexible curriculum framework, credit distribution model, and implementation strategies that optimize existing institutional resources while ensuring academic quality and sustainability. Particular emphasis is placed on employability, industry relevance, research orientation, and the integration of digital and analytical competencies.

A key strength of this initiative lies in its alignment with the broader objectives of the FYUGP, which promotes flexibility, student choice, and multidisciplinary learning pathways. By embedding interdisciplinary approaches within the curriculum, the proposed reforms aim to break traditional academic silos and foster a holistic learning environment that is both locally grounded and globally informed.

The Kerala State Higher Education Council acknowledges the contributions of the committee headed by Prof Suresh Das, (former Executive Vice President, KSCSTE), for evaluating the

implementation of FYUGP Curriculum, in the state Universities and colleges and other academic experts, institutions, and stakeholders who have supported this endeavour. It is envisaged that the implementation of these restructured programmes will revitalize undergraduate education in Kerala, enhance student enrolment, and position the State as a leader in innovative higher education practices in India.

April 2026

Member Secretary

**PROCEEDINGS OF THE MEMBER SECRETARY
THE KERALA STATE HIGHER EDUCATION COUNCIL
Present: Dr. Rajan Varughese**

The Kerala State Higher Education Council — Constituting of Committee to evaluate the implementation of FYUGP curriculum in the State Universities and Colleges - Sanctioned- Orders issued.

KSHEC-A3/307 / EB/ 690-A/2024

Dated, TvpM 19.03.2025

**Read: 1. Minutes of the Executive Body Meeting held on 18.02.2025
2. Note received from the Member Secretary, KSHEC**

ORDER

The Executive Body of the fourth Kerala State Higher Education Council in its meeting held on 18.02.2025 resolved to constitute a Committee under the Chairmanship of Prof. Suresh Das (Former Vice President, Kerala State Council for Science, Technology and Environment) to evaluate the implementation of FYUGP curriculum in the State Universities and Colleges.

Members of the Committee

Sl. No	Name	Capacity in the Committee
1	Prof. Suresh Das (Former Vice President, Kerala State Council for Science, Technology and Environment)	Chairman
2	Dr. K K Damodaran, (Member, Executive Body, KSHEC)	Member
3	Sri. Paul V Karanthanam, (Member, Executive Body, KSHEC)	Member
4	Dr. P.P Ajayakumar Member, (Executive Body, KSHEC)	Member

Coordinator: Dr.Sudheendran. K (Research Officer, KSHEC)


Member Secretary

Copy to:

1. The Principal Secretary to Govt., Higher Education Department with C/L
2. Director of Collegiate Education with C/L
3. Chairman and Members of the Committee
4. Registrars of all Universities with C/L
5. Registrar and FO, KSHEC/ Coordinator
6. Assistants, O/o the VC/MS, KSHEC
7. File/Stock

Modernisation of Existing Undergraduate Courses

1.0 Introduction

In line with the Government of Kerala's directive to restructure undergraduate education, the Kerala State Higher Education Council (KSHEC) and the Higher Education Reforms Cell have undertaken a major academic initiative to reimagine and redesign the existing B.A. and B.Sc. programs offered across universities and affiliated colleges in the state. The purpose of this restructuring is to make Kerala's undergraduate education system globally competitive, locally relevant, and future-proof, in tune with the standards and structures followed by the top 100 universities worldwide.

Globally, higher education is undergoing a paradigm shift toward interdisciplinary learning models that equip students with a blend of disciplinary depth and cross-functional breadth. Institutions like MIT, Stanford, Cambridge, UCL, and others are successfully offering flexible undergraduate programs that integrate science, humanities, technology, and applied social sciences, preparing students to tackle real-world challenges with creativity, critical thinking, and collaboration.

Inspired by these models, KSHEC proposes the introduction of new interdisciplinary undergraduate degree programs that combine core disciplines such as Physics, Chemistry, Mathematics, Zoology, Botany, and Environmental Science with emerging and complementary fields including Computer Science, Public Health, Psychology, Economics, Media Studies, Philosophy, and Design Thinking. This approach is intended to move beyond traditional disciplinary silos and foster multi-domain competencies, digital fluency, and ethical awareness among students.

These programs will not only enhance students' academic and research capabilities but also significantly improve their employability and adaptability in fields such as climate action, AI, health data analytics, science communication, forensic science, sustainable development, policy analysis, bioethics, and heritage management. The curriculum also facilitates pathways into advanced international studies, civil services, innovation sectors, and social entrepreneurship.

This report outlines the following:

- A list of proposed interdisciplinary B.A. and B.Sc. degree programs, curated through benchmarking against global practices.

- Suggested career pathways and academic outcomes for each program.
- A phased implementation strategy aligned with existing institutional resources, regulatory frameworks, and the flexible structure of the Four-Year Undergraduate Program (FYUGP) already adopted in Kerala.

By adopting these restructured programs, Kerala's higher education system can pioneer a new model of undergraduate learning that is contextually grounded and globally informed—preparing a generation of learners who are competent, creative, and committed to solving the complex challenges of our time.

2.0 Interdisciplinary B.Sc. Programs

SI No	Program Name	Core Components	Career Paths
1	BSc in Environmental Science and Climate Studies	Botany, Chemistry, Geology, Geography	Sustainability, ESG roles, environmental consulting
2	BSc in Health Sciences and Nutrition	Zoology, Biochemistry, Botany, Home Science	Public health, wellness, nutritionist
3	BSc in Forensic Science and Criminology	Chemistry, Zoology, Psychology, Law	Forensic analyst, cybercrime, law enforcement
4	BSc in Applied Data Science	Mathematics, Statistics, Computer Science	Data analyst, data engineer, business intelligence
5	BSc in Computational Physics and Instrumentation	Physics, Computer Science, Electronics	R&D, simulation, instrumentation
6	BSc in Quantum Science and Philosophy	Physics, Philosophy, Computer Science	Quantum computing, science policy, research
7	BSc in Sustainable Materials and Environmental Policy	Chemistry, Economics, Environmental Studies	Green tech, sustainability analyst, environmental regulation

SI No	Program Name	Core Components	Career Paths
8	BSc in Biomedical Imaging and Design	Physics, Biomedical Engineering, Visual Communication	Medical imaging, health-tech UX, device design
9	BSc in Climate Science and Rural Development	Botany, Geography, Sociology, Agricultural Engineering	Agro-tech, rural planning, climate solutions
10	BSc in Computational Genomics and Bioethics	Zoology, Mathematics, Philosophy	Genomics, bioinformatics, health policy
11	BSc in Marine Biotechnology and Ocean Governance	Marine Biology, Political Science, Environmental Law	Fisheries management, ocean policy
12	BSc in Cognitive Science and Linguistic AI	Mathematics, Psychology, Linguistics	NLP, AI ethics, HCI, educational tech
13	BSc in Health Data Analytics and Public Policy	Statistics, Public Health, Political Science	Health data analyst, policy consultant
14	BSc in Environmental Analytics and Public Planning	Environmental Science, Economics, GIS/Statistics	Climate planning, GIS analyst, urban development
15	BSc in Science Communication and Digital Media	Physics/Chemistry, Journalism, Visual Design	Science journalism, digital content, public engagement
16	BSc in Artificial Intelligence and Behavioral Science	Computer Science, Psychology, Mathematics	Cognitive AI, behavioral UX, AI product design
17	BSc in Food Science and Nutrition Policy	Chemistry/Botany, Public Health, Nutrition	Food safety, diet policy, nutrition tech
18	BSc in Mathematical Economics and Policy Analytics	Mathematics, Economics, Political Science	Econometrics, policy analytics, financial regulation
19	BSc in Digital Archaeology and Heritage Informatics	Geography/Environmental Science, History, Digital Tools	Heritage tech, GIS archaeology, cultural mapping

3.0 Interdisciplinary B.A., B.Com, and B.S.W. Programs

SI No	Program Name	Core Departments	Career Pathways
1	BA in Digital Journalism and New Media	Media Studies, English, Computer Science	Content creation, journalism, digital publishing
2	BA in Public Policy and Governance	Political Science, Economics, Law, Public Administration	Government, think tanks, policy analysis
3	BA in Anthropology, Culture and Heritage Studies	Anthropology, History, Sociology, Geography	Museums, tourism, cultural institutions
4	BA in Digital Humanities	English, Languages, History, Computer Science	Digital archiving, publishing, content development
5	BA in Gender Studies and Social Justice	Sociology, History, Social Work, Law	NGOs, advocacy, gender policy research
6	BA in Psychology and Community Welfare	Psychology, Social Work, Education	Counselling, community development, NGO sector
7	BA in Media, Culture and Society	English, History, Political Science, Media Studies	Media research, development agencies, publishing
8	BA in Philosophy, Ethics and Society	Philosophy, Political Science, Law	Ethical leadership, academia, civil services
9	BA in International Relations and Global Politics	Political Science, History, Economics	Diplomacy, international NGOs, global policy
10	BA in Constitution and Legal Studies	Law, Political Science, Sociology	Legal assistance, social justice, civil services
11	BA/BSc in Liberal Arts and Sciences	Combined disciplines across Arts and Sciences	Interdisciplinary careers, higher studies, public services
12	BSW – Bachelor of Social Work	Social Work, Psychology, Sociology, Political Science	NGOs, community development, welfare departments
13	BCom in Financial Technology (FinTech)	Commerce, Computer Science, Accounting	FinTech, blockchain, banking tech

SI No	Program Name	Core Departments	Career Pathways
14	BCom in Sustainable Business and CSR	Commerce, Environmental Studies, Sociology	CSR management, ESG compliance
15	BCom in E-Commerce and Digital Marketing	Commerce, Computer Science, Management	Digital marketing, e-commerce platforms
16	BCom in Entrepreneurship and Startup Management	Commerce, Management, Economics	Startups, incubators, innovation hubs

4.0 Implementation

To address the issue of declining student enrolment and underutilization of faculty and infrastructure in many traditional undergraduate programmes (BSc, BA, BCom), it is proposed that colleges facing excess staff due to vacant seats or colleges with low student intake or any intersteing colleges may be allowed to introduce selected restructured, job-oriented programmes using their available workload and academic resources.

The proposed restructured undergraduate programmes may be offered as interdisciplinary or multidisciplinary in nature. Each programme should have a designated Programme Coordinator. Colleges may reallocate or transfer available faculty from existing departments as an adjunct faculty of this programmes to design and deliver the courses. To address any remaining academic requirements, institutions may incorporate online learning components or engage guest/invited faculty from academia, industry, or professional skill training agencies. This flexible model will ensure optimal use of existing manpower and infrastructure while maintaining academic quality and relevance. The approach aims to make the programmes dynamic, industry-aligned, and responsive to evolving student and job market needs.

5.0 Key Guidelines for Implementation:

i. Utilization of Existing Faculty Workload:

- Colleges with surplus faculty capacity due to reduced student enrolment can offer newly designed, interdisciplinary programmes without needing additional permanent appointments.
- The existing faculty can be retrained and deployed for these programmes, especially in areas where there is academic overlap or potential for upskilling.

ii. **Engaging Guest Faculty for New Disciplines:**

- If certain core subjects within the new programmes require expertise not currently available in the college, institutions may engage **qualified guest faculty**.
- A **credit-based remuneration system** can be implemented, where fees for the credits taught by guest faculty are defined in advance, enabling a **self-sustaining financial model** for running the programmes.

iii. **Flexible Curriculum Design:**

- Colleges can incorporate **online credit courses** (from SWAYAM, NPTEL, or other approved platforms) as part of the curriculum to fill gaps in faculty availability and offer exposure to emerging domains.
- Programmes may also include **industry-driven content**, experiential learning, and project-based modules to ensure employability and practical relevance.

iv. **Collaboration with Industry and Skill Training Agencies:**

- Colleges may partner with **industry professionals**, sector skill councils, or training centres such as the **Centre for Skill Development Courses and Career Planning (CSDCCP)** to offer credit-based skill modules.
- This will ensure that programmes remain **aligned with current industry trends** and enable students to gain **hands-on experience**.

v. **Sustainability and Quality Assurance:**

- These restructured programmes must be run on a **pilot basis in project mode for a period of five years**, with **annual review** of student demand, faculty performance, and placement outcomes.
- The financial model should be designed to ensure **minimal or no additional burden** on the government, making the programmes **financially viable and academically robust**.

6.0 Summary

With the implementation of the Four-Year Undergraduate Programme (FYUGP), Kerala has successfully adopted a globally aligned, flexible curriculum framework. This structural shift has provided higher education institutions the opportunity to modernize academic offerings, encourage learner autonomy, and align educational pathways with international standards.

However, despite this framework's flexibility, a majority of degree programs still follow conventional mono-disciplinary models. In contrast, leading universities worldwide are transitioning towards

interdisciplinary and multidisciplinary education, integrating science, technology, humanities, and social sciences to address complex real-world challenges and prepare students for emerging careers.

In this context, the introduction of a new set of restructured interdisciplinary UG programs is a timely step toward transforming Kerala into a globally competitive education hub. These programs are modeled on successful international offerings and designed to foster domain integration, innovation, and employability.

To ensure academic quality and institutional readiness, it is proposed that these programs be introduced in a phased manner, beginning with:

- University departments or constituent colleges,
- Autonomous colleges,
- Institutions with NAAC accreditation, or
- Colleges ranked in the top 100 in NIRF or top 50 in KIRF.

Accreditation and demonstrated academic excellence must be mandatory criteria for offering these interdisciplinary programs, ensuring high standards and replicable success. This reform will position Kerala's higher education sector as both forward-looking and globally relevant.

Part 2: Interdisciplinary Curriculum Model for Kerala's UG Programs

1.0 Introduction

Kerala's higher education system is undergoing a major transformation aimed at making undergraduate education more flexible, relevant, and responsive to the evolving needs of students and society. The introduction of the Four-Year Undergraduate Programme (FYUGP) across universities and affiliated colleges marks a significant step forward in redefining academic structures to better align with global academic trends and local aspirations.

The FYUGP framework provides opportunities for both academic depth and disciplinary breadth, thereby enabling students to explore and engage with diverse domains of knowledge. A core objective of the ongoing academic reforms in Kerala is to revitalize undergraduate education by restructuring traditional courses and designing new programs that are both attractive and job-oriented. This shift reflects a growing awareness that the existing discipline-bound models of education often fail to inspire students or adequately prepare them for emerging career pathways.

Multidisciplinary education is at the heart of this reform agenda. It encourages institutions to break down academic silos and offer students learning pathways that combine different fields of study, fostering creativity, critical thinking, and problem-solving. While this is not a new idea—multidisciplinary centres and departments began emerging globally in the 1970s—the current phase of reform in Kerala seeks to integrate multidisciplinary approaches more systematically into the undergraduate curriculum.

Earlier reforms such as the Choice Based Credit System (CBCS) laid the groundwork for this shift by giving students the freedom to select elective courses from a variety of disciplines. Building on this, the FYUGP introduces further flexibility by allowing students to choose majors, minors, and multidisciplinary thematic electives. However, for this vision to materialize meaningfully, a structured effort toward course and program restructuring is essential.

To appreciate the significance of multidisciplinary curriculum design, it is helpful to understand the conceptual distinctions among various modes of disciplinary interaction:

- A **discipline** is a distinct and organized body of teachable knowledge with its own content, methods, and training—such as Chemistry, Economics, or Literature, commerce

- **Multidisciplinarity** refers to the juxtaposition of different disciplines, often without deep integration. For instance, a program combining Music, Mathematics, and History exposes students to diverse fields without necessarily blending them.
- **Pluridisciplinarity** groups disciplines that are assumed to be more naturally related—such as Mathematics and Physics, or French, Latin, and Greek in classical humanities.
- **Interdisciplinarity** involves meaningful interaction between disciplines, where concepts, methods, and frameworks from different areas are brought together to address complex problems or develop new knowledge. An example would be a program that integrates Public Health, Sociology, and Data Science to study health equity.
- **Transdisciplinarity** goes even further, establishing a shared set of axioms or frameworks that transcend individual disciplines—such as Anthropology as a holistic study of human behavior.

Among these, interdisciplinarity is particularly relevant for the current phase of higher education reforms in Kerala, as it enables both integration and innovation. Though the terms “multidisciplinary” and “interdisciplinary” are often used interchangeably in non-technical contexts, academic discourse favors “interdisciplinary” for its emphasis on synthesis and collaboration across disciplines.

Designing effective multidisciplinary programs under the FYUGP requires careful consideration of student interests, institutional capacity, and academic coherence. Many traditional undergraduate programs in Kerala, while strong in disciplinary content, are facing challenges in attracting students due to limited flexibility and unclear links to career outcomes. Restructuring these programs by integrating complementary disciplines and skill-based components can make them more appealing and aligned with contemporary expectations.

Moreover, the implementation of flexible academic structures—such as major-minor combinations, project-based learning, internships, and credit-based interdisciplinary electives—can significantly enhance the relevance and employability of graduates. Institutions can leverage their existing faculty expertise, facilities, and academic networks to offer new program models that are rigorous, future-ready, and contextually rooted.

This report provides a conceptual and practical framework for the design and restructuring of multidisciplinary undergraduate programs in Kerala. It outlines the typologies of multidisciplinary integration, suggests approaches for curriculum redesign, and recommends institutional strategies to

operationalize these reforms. The goal is to empower higher education institutions in Kerala to create innovative, student-centric academic offerings that nurture broad-based knowledge, critical inquiry, and the skills necessary to address real-world challenges.

Through this initiative, Kerala can set a national benchmark for multidisciplinary undergraduate education—one that blends academic excellence with social relevance and employability.

2.0 Design of the restructured Degree programs using the Interdisciplinary/ Transdisciplinary Pathways in the FYUG Programme

The Four-Year Undergraduate Programme (FYUGP) is conceptualized on the **major–minor framework**, enabling students to develop **core competency in one major discipline** along with **auxiliary competencies in one or two additional disciplines** through designated minor pathways. This flexible design promotes depth and breadth in undergraduate education while allowing students to tailor their academic journey according to their interests and aspirations.

Among the multiple pathways permitted under the FYUGP, the **interdisciplinary/multidisciplinary major pathway** represents a distinct and academically rich model. In this pathway, students achieve their **core academic competency by integrating three or more disciplines**, rather than concentrating on a single major subject. The total credits normally assigned to the major–minor combination in the FYUGP are redistributed among the participating disciplines, in a manner that supports the coherence and academic logic of the chosen multidisciplinary theme.

In the proposed restructured multidisciplinary programs being developed under the FYUGP in Kerala, the 12 credits generally used for building minor competencies in the traditional model are instead embedded within the **multidisciplinary core** itself. This ensures that the program develops **interconnected, domain-spanning knowledge** across disciplines from the outset.

However, to retain **flexibility and promote academic exploration**, **24 out of the 36 credits** originally designated for the minor component in a four-year programme (**12 credits in the case of a three-year degree**) are still made available to students as **open electives**. These credits may be utilized to pursue courses offered by the disciplines that constitute the multidisciplinary core, or from entirely unrelated academic domains, thereby enriching the student’s intellectual engagement and academic diversity.

Importantly, if a student wishes to earn a formal **minor** within the four-year programme, this remains possible. By choosing to complete the full 24 credits in a **single discipline outside the**

disciplines already contributing to the multidisciplinary core, the student can fulfill the criteria for a recognized minor alongside the multidisciplinary major. This approach balances academic structure with individual choice and enhances both specialization and versatility in undergraduate education.

This design strengthens academic integration while preserving student autonomy, making Kerala's FYUGP multidisciplinary pathways both structurally sound and learner-centric.

3.0 Credit Distribution Framework for Interdisciplinary /Multidisciplinary Undergraduate Programs

Component	Credits (3-Year Program)	Credits (4-Year Honours Program)	Remarks
Core Disciplines (Multidisciplinary)	80	112 (<i>includes a 12-credit project</i>)	Core courses designed by integrating three or more disciplines forming the multidisciplinary major.
Open Elective / Academic Elective/Minor	12	24	Students may explore elective courses within the integrated disciplines or from unrelated fields .
Ability Enhancement Courses (AEC)	12	12	Courses on communication, academic writing, and language proficiency skills .
Skill Enhancement Courses (SEC)	9	9	Practical and skill-based courses related to the student's core disciplines of study .
Multidisciplinary / Interdisciplinary Courses (MDC)	9	9	Thematic or integrative courses combining perspectives from multiple disciplines.
Value-Added Courses (VAC)	9	9	Courses focusing on employability, innovation, civic engagement, leadership, and sustainability .
Internship / Field-based Learning	2	2	Mandatory component for hands-on experience , community engagement, or industry exposure.
Total	133	177	

Part 3: Examples of Interdisciplinary / Multidisciplinary Programme Design using the Credit Distribution Framework

1 BSc in Environmental Science and Climate Studies

proposal for BSc in Environmental Science and Climate Studies under the Four-Year FYUGP Multidisciplinary Program framework, based on integration of the core disciplines: Botany, Chemistry, Geology, and Geography. The credit distribution and course suggestions are inspired by global best practices

Core Credit Share Across Disciplines (Total: 112 Credits)

Discipline	Credits	No. of Courses (Approx.)	Remarks
Botany	26	6–7 (including field/lab)	Ecology, biodiversity, forest systems, urban vegetation
Chemistry	28	7 (including lab courses)	Environmental chemistry, analytical techniques, pollution control
Geology	28	7 (field + GIS/lab work)	Earth systems, hydrology, soil science, climate history, geohazards
Geography	30	7–8 (theory + GIS/lab/field)	Climatology, land use, remote sensing, environmental modeling
Capstone Research Project	Included in above (12 credits in final year)	1 major project	Topic chosen from any or a combination of the above

Proposed Disciplinary Core and Elective Course Structure

The B.Sc. in Environmental Science and Climate Studies is designed as a multidisciplinary major integrating foundational and applied knowledge from Botany, Chemistry, Geology, and Geography. Each core course can be structured as a 4-credit unit, comprising 3 credits of theory and 1 credit for practical/laboratory/field-based components or a mini project, ensuring students acquire both conceptual clarity and hands-on experience in real-world environmental contexts.

The **Botany component** contributes **26 core credits** through the following integrated course areas: *Plant Ecology and Ecosystem Dynamics, Biodiversity Conservation and Restoration, Environmental Plant Physiology, Forest Ecology and Management, and Field Methods in Plant Ecology*. These courses expose students to plant-environment interactions, biodiversity mapping, forest system analysis, and ecological survey techniques, supported by practical fieldwork.

The **Chemistry component**, with **28 credits**, includes courses such as *Fundamentals of Environmental Chemistry, Atmospheric and Climate Chemistry, Analytical Techniques for Environmental Monitoring, Water Chemistry and Pollution, and Laboratory in Environmental Chemistry*. These courses equip students with theoretical and practical knowledge to assess air, water, and soil quality, and monitor pollution using laboratory instrumentation and chemical analysis techniques.

The **Geology component**, also contributing **28 credits**, features courses like *Earth System Science, Soil Science and Land Degradation, Hydrogeology and Watershed Management, Paleoclimatology and Climate Change, and Field Work in Earth and Environmental Sciences*. Students engage in geological fieldwork, soil and hydrological profiling, and interpretation of climate proxies, providing essential insights into Earth processes and their environmental implications.

The **Geography component**, which comprises **30 core credits**, offers courses such as *Physical Geography and Earth Surface Processes, Climatology and Weather Systems, GIS and Remote Sensing in Environmental Studies, Sustainable Development and Environmental Policy, and Environmental Modelling and Data Analysis*. These courses emphasize spatial analysis, climate systems, and sustainable planning, supported by GIS and remote sensing labs, modelling tools, and data interpretation exercises.

In addition to the core curriculum, a set of discipline-based electives offers students the flexibility to pursue areas of specialization or interdisciplinary interest. Suggested **Botany electives** include *Medicinal Plants and Traditional Knowledge, Urban Ecology, and Agroecology*. **Chemistry electives** include *Green Chemistry and Sustainable Technologies, Toxicology and Risk Assessment, and Industrial Pollution and Control*. **Geology electives** feature *Natural Hazards and Disaster Risk Reduction, Geoinformatics for Environmental Monitoring, and Marine Geology and Coastal Processes*. From **Geography**, electives such as *Climate Change Adaptation Planning, Population and Environment, and Environmental Justice and Climate Equity* are recommended. These electives are designed to deepen the student's domain-specific knowledge and enhance their readiness for research, higher studies, or careers in environmental sectors.

2 B.Sc. in Forensic Science and Criminology

This is a multidisciplinary undergraduate program designed to equip students with integrated knowledge and skills in the domains of **Chemistry, Zoology, Psychology, and Law**. It prepares graduates to investigate, analyze, and understand criminal behavior and forensic evidence in a scientific and legally grounded manner. The curriculum is aligned with global models offered by leading institutions such as the University of Lausanne (Switzerland), UCL (UK), Penn State University (USA), and Griffith University (Australia). The program follows the **Outcome-Based Education (OBE)** model and is structured within the **Four-Year Undergraduate Programme (FYUGP)** framework.

Core Credit Share by Discipline (Total Core Credits = 112)

Discipline	Credits	Remarks
Chemistry	32	Analytical chemistry, toxicology, and trace evidence analysis
Zoology	26	Entomology, anatomy, and forensic zoological analysis
Psychology	30	Criminal psychology, profiling, cognitive and behavioral science
Law	24	Criminal law, procedures, forensic legal frameworks

Proposed Disciplinary Core and Elective Course Structure

The **B.Sc. in Forensic Science and Criminology** is a multidisciplinary program that draws its academic strength from four major disciplines—**Chemistry, Zoology, Psychology, and Law**. The disciplinary core is structured to provide a strong theoretical foundation combined with applied learning through laboratory work, field training, and case-based analysis. Each core course follows a **4-credit structure**, comprising **3 credits of theory** and **1 credit of practical, laboratory, fieldwork, or mini-project**, ensuring experiential learning aligned with the Outcome-Based Education (OBE) framework.

The **Chemistry core** contributes **32 credits** and includes courses such as *Forensic Analytical Chemistry, Toxicology and Poisons, Crime Scene Chemistry, Instrumental Methods of Analysis, and Environmental Forensics*. These courses equip students with the chemical principles and analytical techniques necessary for examining substances, residues, and physical evidence commonly encountered at crime scenes.

The **Zoology core**, with **26 credits**, covers specialized areas such as *Forensic Entomology*, *Human Anatomy and Osteology*, *Wildlife Forensics*, *Postmortem Biology*, and *Comparative Physiology in Forensics*. These courses prepare students to analyze biological remains, understand decomposition processes, and apply zoological knowledge to both human and animal forensic investigations.

The **Psychology component**, offering **30 credits**, focuses on the cognitive and behavioral aspects of crime through courses such as *Criminal Psychology*, *Cognitive Neuroscience*, *Behavioral Assessment*, *Offender Profiling*, and *Psychology of Violence and Trauma*. These courses provide students with tools to analyze motivations, mental health issues, and social contexts associated with criminal behavior.

The **Law discipline**, accounting for **24 credits**, provides the legal grounding essential to forensic practice. Courses include *Criminal Law and Procedure*, *Indian Penal Code and Evidence Act*, *Forensic Documentation and Testimony*, and *Cyber Laws and Digital Forensics*. These courses ensure that students understand the principles and procedures of criminal justice, rules of evidence, and legal protocols relevant to forensic investigation.

In addition to the core courses, the program offers a selection of **discipline-specific electives** to support specialization and individual academic interests. Suggested **Chemistry electives** include *Explosive Materials and Narcotics* and *Nanotechnology in Forensics*. **Zoology electives** may include *DNA Barcoding for Species Identification* and *Invertebrate Analysis in Crime Scenes*. In **Psychology**, electives such as *Juvenile Delinquency and Correctional Psychology* and *Forensic Counseling* are offered, while **Law electives** include *Victimology*, *Human Rights and Criminal Justice*, and *International Criminal Law*. These electives allow students to tailor their academic trajectory toward specific domains within the broader field of forensic science and criminology.

The core and elective structure is supported by internships, simulation exercises, mock trials, and research projects, ensuring that students graduate with the knowledge, skills, and professional ethics needed to succeed in forensic laboratories, law enforcement, legal consulting, or further academic pursuits.

3: B.Sc. in Applied Data Science

It is a contemporary, multidisciplinary undergraduate program developed to meet the growing demand for data-literate professionals across industries. It integrates foundational and applied knowledge from **Mathematics**, **Statistics**, and **Computer Science**, empowering students to build strong competencies in data modeling, machine learning, programming, and data interpretation. The

program aligns with global models offered by top universities such as MIT, Stanford, ETH Zurich, and NUS, and follows the **Four-Year Undergraduate Programme (FYUGP)** structure with a strong emphasis on **Outcome-Based Education (OBE)**.

The total of **112 core credits** is distributed across three key contributing disciplines as outlined below:

Core Credit Share by Discipline

Discipline	Credits	Remarks
Mathematics	34	Linear algebra, calculus, discrete mathematics, optimization
Statistics	38	Probability, inference, multivariate analysis, statistical computing
Computer Science	40	Programming, algorithms, machine learning, cloud computing

Proposed Disciplinary Core and Elective Course Structure

The program offers core and elective courses in Mathematics, Statistics, and Computer Science, each structured as 4-credit units (3 credits theory + 1 credit practical/lab/project). This structure ensures a strong theoretical base and practical orientation, aligned with FYUGP and global standards.

The **Mathematics component** includes foundational courses such as *Linear Algebra for Data Science*, *Multivariable Calculus*, *Discrete Mathematics*, *Numerical Methods*, and *Optimization Techniques*. These equip students with the mathematical tools required to model, analyze, and interpret data.

The **Statistics stream** introduces students to *Probability and Statistical Inference*, *Regression Analysis*, *Bayesian Statistics*, *Time Series Analysis*, and *Design of Experiments*. Lab components include statistical computing using tools like R and Python.

The **Computer Science core** includes *Python Programming*, *Data Structures and Algorithms*, *Database Management*, *Machine Learning*, *Big Data Analytics*, and *Cloud Platforms for Data Science*. Students also develop applied projects and tools for data visualization and real-time analytics.

In the **final year**, students undertake a **Capstone Project** (12 credits) that integrates their learning into a real-world or research-based problem, often in collaboration with industry or research institutions.

Electives offer specialization opportunities in areas such as *Deep Learning*, *Natural Language Processing*, *Graph Theory*, *Statistical Learning*, *Data Ethics*, and *Stochastic Processes*. Students are also

supported through **Ability Enhancement Courses (AEC)**, **Skill Enhancement Courses (SEC)**, and **Value-Added Courses (VAC)** covering communication, writing, ethics, and entrepreneurship.

4 B.Sc. in Smart Energy and Nanotechnology

It is an innovative and future-oriented undergraduate degree that integrates **Physics**, **Chemistry**, **Electronics**, and **Materials Science** to prepare students for cutting-edge roles in sustainable energy and advanced material technologies. Offered under the **Four-Year Undergraduate Programme (FYUGP)** and designed with an **Outcome-Based Education (OBE)** framework, the program addresses the core themes of **Industry 5.0**, including smart systems, green energy, and human-centric innovation. Drawing on global models such as the **Energy Futures Lab at Imperial College London**, **MIT's Energy Initiative**, and **TUM's NanoScience & Engineering track**, the program empowers students with hands-on learning, interdisciplinary expertise, and research capabilities. It prepares graduates to contribute to the development of next-generation solar cells, energy storage systems, energy-efficient electronics, and nano-enabled environmental technologies.

Core Credit Share by Discipline

Discipline	Credits	Remarks
Physics	28	Quantum mechanics, thermodynamics, solid-state physics, photonics
Chemistry	28	Electrochemistry, green chemistry, catalysis, surface chemistry
Electronics	28	Circuit design, embedded systems, smart sensors, energy systems
Materials Science	28	Nanomaterials, thin films, composites, materials characterization

Courses are designed as **4-credit units** with **3 credits of theory** and **1 credit for practical/lab/project work**. Each discipline contributes foundational and application-oriented content that supports a holistic understanding of energy and nano-material systems.

- The **Physics component** includes: *Solid-State Physics*, *Thermodynamics for Energy Systems*, *Photonics and Energy Transfer*, and *Quantum Devices*. Labs focus on optical, thermal, and quantum behavior of materials.
- The **Chemistry component** includes: *Electrochemical Energy Conversion*, *Green Chemistry and Sustainability*, *Catalysis and Surface Chemistry*, and *Materials Chemistry*. Practical work involves synthesis and testing of materials for energy applications.

- The **Electronics stream** includes: *Smart Sensor Systems, Embedded Systems for Energy Devices, Power Electronics, and IoT for Energy Monitoring*. Labs include microcontroller programming and real-time system integration.
- The **Materials Science track** includes: *Introduction to Nanomaterials, Thin Film Technology, Composite Materials, and Characterization Techniques*. Hands-on work includes SEM, XRD, and spectroscopic analysis.

Students also engage in **electives** such as *Energy Policy and Innovation, AI in Materials Discovery, Flexible and Wearable Energy Systems, Perovskite Solar Cells, and Battery Technology*. A **Capstone Project (12 credits)** is undertaken in the fourth year, often with research institutions or energy startups.

5 B.Sc. in Mathematical Economics and Policy Analytics

It is an innovative interdisciplinary program that integrates economics, mathematics, statistics, and data science to address complex policy challenges. Modeled on globally renowned programs at institutions like the London School of Economics, University of California Berkeley, and the University of Warwick, this course equips students with quantitative tools to analyze economic trends, model policy outcomes, and support evidence-based decision-making. With a strong foundation in economic theory, econometrics, and modern analytics, graduates are well-prepared for careers in public policy, financial institutions, international organizations, and research, or for advanced studies in economics and public affairs.

Final Core Credit Distribution B.Sc. in Mathematical Economics and Policy Analytics

Discipline	Credits	Remarks
Mathematics	32	Foundational quantitative methods, modeling, data analysis
Economics	32	Theory, development, econometrics, public finance, global economics
Political Science	36	Governance, political economy, policy evaluation, public institutions
Interdisciplinary Project	12	One capstone policy analytics project

6 The B.A. in Digital Journalism and New Media.

It is a cutting-edge interdisciplinary program designed to equip students with the skills and critical insights needed to navigate today's fast-evolving media landscape. Modeled after globally acclaimed programs at institutions such as Columbia Journalism School, University of Amsterdam, and Cardiff University, the course blends journalism, communication, data analysis, visual storytelling, and digital technologies. Students gain hands-on experience in multimedia reporting, social media strategy, and ethical journalism. With strong industry linkages and a focus on employability, graduates are prepared for dynamic careers in news organizations, digital media startups, content creation, and public communication sectors worldwide.

Core Credit Distribution: B.A. in Digital Journalism and New Media

Discipline	Credits	Remarks
Media Studies	36	Journalism, visual storytelling, media law, ethics, news reporting
English	32	Writing, communication, media language, narrative theory
Computer Science	32	Web publishing, data journalism, multimedia tools, digital platforms
Interdisciplinary Project	12	Final digital journalism/new media project with portfolio
Total	112	

7 B.A. in Digital Humanities

The proposed B.A. in Digital Humanities is a future-facing multidisciplinary undergraduate program developed in alignment with the Four-Year FYUGP structure. It brings together the richness of traditional humanities disciplines—such as History, Literature, and Philosophy—with the transformative tools of digital technology, computational analysis, and digital media production. The program is inspired by leading global initiatives in institutions such as King's College London, Stanford University, University College London, University of Leipzig, and University of Virginia.

The curriculum is designed to equip students with the intellectual grounding of humanistic inquiry and the practical skills to engage with cultural, historical, and literary materials through digital platforms. It supports the development of creative and analytical thinkers who can operate across academic,

cultural, and technological domains, and are prepared for careers in digital archiving, cultural analytics, heritage technology, public history, publishing, and digital content creation.

Core Credit Distribution (Total: 112 Credits)

Discipline	Credits	Remarks
Humanities Core (History, Literature, Philosophy)	44	Critical reading, historiography, theory, culture, and ethics
Digital Methods (Computer Science, Digital Media)	32	Programming, digital publishing, data visualization, web tools
Interdisciplinary Practice & Research	24	Public humanities, archival studies, project design, and ethics
Capstone Project	12	Research or community-engaged digital humanities project

8 B.Sc. in Biomedical Imaging and Design

The proposed B.Sc. in Biomedical Imaging and Design is an innovative multidisciplinary undergraduate program designed under the Four-Year FYUGP structure. It integrates the disciplines of Physics, Biomedical Engineering, and Visual Communication to develop professionals capable of designing, analyzing, and visualizing biomedical imaging technologies and content.

The program is structured to offer students a solid grounding in the principles of imaging physics, digital signal processing, medical instrumentation, and visual storytelling. By combining rigorous scientific training with creative design thinking, the program prepares students to contribute to fields such as medical diagnostics, healthcare visualization, biomedical device design, digital health communication, and human-centered design for medicine.

This program takes inspiration from globally reputed programs such as those offered at Johns Hopkins (BME Design Team Program), Imperial College (Medical Physics and Bioengineering), NUS (Biomedical Engineering), and MIT (HST Imaging Track).

Core Credit Distribution (Total: 112 Credits)

Discipline	Credits	Remarks
Physics	36	Imaging physics, optics, radiation, instrumentation
Biomedical Engineering	40	Medical devices, signal processing, diagnostics, human physiology
Visual Communication	24	Design tools, 3D visualization, science communication
Interdisciplinary Project	12	Capstone project on imaging design or diagnostics interface development

9 B.Sc. in Computational Physical Sciences

The B.Sc. in Computational Physical Sciences is a comprehensive multidisciplinary undergraduate program designed under the Four-Year FYUGP framework. It integrates five core scientific disciplines—Physics, Mathematics, Computer Science, Chemistry, and Statistics—to equip students with theoretical foundations and practical skills for modeling, simulation, and data-driven analysis in physical sciences.

This program is inspired by global best practices from leading institutions such as Caltech, University of Cambridge, ETH Zurich, University of Tokyo, and Indian Institute of Science (IISc). It addresses the increasing demand for graduates with strong analytical, computational, and laboratory skills to tackle complex scientific and technological problems in energy, materials science, climate modeling, quantum computing, and more.

Core Credit Distribution (Total: 112 Credits)

Discipline	Credits	Remarks
Physics	28	Mechanics, electromagnetism, optics, quantum, thermal physics
Mathematics	20	Calculus, linear algebra, differential equations, mathematical physics
Computer Science	20	Programming, algorithms, scientific computing, simulation tools
Chemistry	20	General chemistry, physical chemistry, spectroscopy, lab techniques
Statistics	12	Descriptive stats, probability, inference, statistical computing
Capstone Project	12	Applied project in simulation, data modeling, or experimental design

10 B.Com in E-Commerce and Digital Marketing

The B.Com in E-Commerce and Digital Marketing is a forward-looking undergraduate program developed under the Four-Year FYUGP (Four-Year Undergraduate Program) framework. It brings together the disciplines of Commerce, Computer Science, and Management, offering students a balanced and application-oriented curriculum that prepares them for dynamic careers in online business, digital branding, and data-driven commerce.

This program is inspired by globally recognized models offered by leading institutions such as New York University (Stern School of Business), University of Melbourne, National University of Singapore, University of Warwick, and IIM Indore (IPM track). It is designed to impart core knowledge in financial systems, business processes, and consumer behavior, while equipping students with technological fluency in digital platforms, analytics, e-commerce tools, and online marketing techniques.

Core Credit Distribution (Total: 112 Credits)

Discipline	Credits	Remarks
Commerce	44	Financial accounting, business law, taxation, auditing, e-commerce finance
Computer Science	32	Programming, databases, web development, data analytics, digital tools
Management	24	Marketing, consumer behavior, brand management, entrepreneurship
Capstone Project	12	Industry-linked project in e-commerce or digital marketing

11 B.Com in Financial Technology (FinTech)

The B.Com in Financial Technology (FinTech) is an innovative undergraduate program that blends the disciplines of Commerce, Computer Science, and Financial Management to equip students with expertise in the evolving landscape of digital finance. Developed under the Four-Year FYUGP framework, this program offers a future-ready curriculum that combines accounting, finance, and banking with data analytics, blockchain, cybersecurity, and emerging financial technologies.

Drawing inspiration from global models offered by London School of Economics (LSE), University of Hong Kong, National University of Singapore, MIT Sloan, and IIM Ahmedabad, the program addresses

the growing demand for professionals who can operate at the intersection of finance and technology in domains such as digital payments, robo-advisory, peer-to-peer lending, and algorithmic trading.

Core Credit Distribution (Total: 112 Credits)

Discipline	Credits	Remarks
Commerce & Finance	44	Financial accounting, banking, taxation, financial markets, risk management
Computer Science	32	Programming, databases, blockchain, AI, cybersecurity
Financial Technology	24	FinTech applications, digital banking, algorithmic trading, RegTech
Capstone Project	12	Project in digital finance, fintech product design, or blockchain integration



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