GURU NANAK COLLEGE OF PHARMACEUTICAL SCIENCES DEHRADUN

Affiliated to Veer Madho Singh Bhandari Uttarakhand Technical University

Approved by Pharmacy Council of India · Established 2018

PHARMA INSIGHT

Volume II — Annual Magazine

Academic Year 2023–24

August 2023 – July 2024

— Institutional Highlights · Global Pharma Developments · Student Excellence —

FROM THE CEO's DESK

A Message to the GNCPS Community · August 2022 – January 2023

"

As we present the inaugural issue of our college newsletter, I feel a profound sense of pride in the collective achievements of our institution. Over the past six months, from August 2022 to January 2023, Guru Nanak College of Pharmaceutical Sciences has witnessed remarkable growth and dynamic engagement across academic, cultural, and social domains. From insightful seminars on pharmaceutical research and workshops on intellectual property, to vibrant celebrations of our national and cultural heritage, energetic sports events, and meaningful community outreach initiatives, this period truly reflects the spirit and dedication of our academic community.

I extend my sincere appreciation to the editorial team for their dedication and creativity in bringing together this publication. Their efforts have ensured that our collective accomplishments are thoughtfully documented and shared.

— Mr. Bhupinder Singh Arora, CEO

FROM THE PRINCIPAL'S DESK

Principal's Foreword — Academic Year 2023–24

"

This second annual magazine of our College arrives at a moment when GNCPS has truly found its voice. The 2023–24 academic year has been one of maturation — our faculty have published and taught with growing confidence, our students have competed and won at external forums, and the calendar of co-curricular activities has expanded with new depth and sophistication. Just as important, the world of pharmaceutical science that our graduates will enter has continued to evolve at breathtaking speed. From the first CRISPR gene therapy to the cementing of the GLP-1 revolution, from AlphaFold 3 to the Indian CDSCO's regulatory liberalisation — the year that this magazine records has been one of epochal change for our profession. I hope every reader will find in these pages both a celebration of what we have achieved and a glimpse of the exciting professional world that awaits our students.

— Dr. S. Duraivel, Principal

FROM THE EDITOR'S DESK

Editor's Note — Volume II — Annual Magazine

"

This second annual magazine continues the editorial model established in Volume I and extends it with additional coverage of the 2023–24 pharmaceutical landscape. The developments chosen for this volume — CRISPR gene therapy, cardiovascular GLP-1 outcomes, AlphaFold 3, Lenmeldy gene therapy, the IRA price negotiation list, and others — collectively offer a picture of a pharmaceutical industry in profound transformation. We have tried, as always, to present each development in language accessible to pharmacy students and readers without losing the technical depth that these topics deserve. The institutional sections complement the global coverage and provide the authentic flavour of our year as a GNCPS community.

— Ms. Kriti Dabral, Editor

ABOUT THE COLLEGE

Guru Nanak College of Pharmaceutical Sciences, Dehradun

Guru Nanak College of Pharmaceutical Sciences, Dehradun, was established in 2018 under the aegis of the Guru Nanak Educational Trust. The College is affiliated with Veer Madho Singh Bhandari Uttarakhand Technical University and is approved by the Pharmacy Council of India. Situated in Jhajhra on the Chakrata Road in Dehradun, Uttarakhand, the institution offers a four-year undergraduate Bachelor of Pharmacy programme designed to produce graduates who are technically competent, ethically grounded, culturally rooted, and professionally ready.

The College's vision is to emerge as a centre of excellence in pharmaceutical education and research, producing professionals who contribute meaningfully to healthcare, community well-being, and the broader pharmaceutical industry. Its mission is pursued through a balanced curriculum that combines rigorous academic instruction with co-curricular and extra-curricular opportunities — from student clubs in sports, culture, research, and entrepreneurship, to industry-academia partnerships, to community outreach programmes, to a steady calendar of guest lectures, workshops, and national-day observances.

A dedicated faculty team, led by the Principal and supported by the Heads of Department and senior professors, guides students through a programme that is both demanding and deeply rewarding. State-of-the-art laboratories, a well-stocked library, modern classroom infrastructure, hostels, and recreational facilities support the student experience.

Above all, the College prides itself on being a community — one in which faculty, students, and staff together shape an environment of learning, warmth, and purpose. This newsletter is one expression of that community spirit.

IN THIS MAGAZINE

COLLEGE HIGHLIGHTS

Institutional Snapshot — Academic Year 2023–24

The 2023-24 academic year at Guru Nanak College of Pharmaceutical Sciences, Dehradun was a year of maturation. Building on the foundations laid in earlier years, the College achieved significant milestones in industry-academia engagement, student participation in national events, and the formalisation of systematic co-curricular learning. Faculty research output grew, infrastructure expanded, and the student community demonstrated increasing confidence in external competitions — reflecting the steady development of institutional culture.

HEADLINE HIGHLIGHTS

19 Industry/Hospital Interaction Events	Structured seminars and workshops with external experts from pharmacy, hospital, and research institutions
21 Pharmacy-Focused Research Seminars	Covering drug discovery, pharma technology, pharmaceutical care, and intellectual property
Students Represented GNCPS at AIIU Sports Tournament	All India Inter University Tournament at HNBGU Srinagar (Dec 2023) with 16 student participants
National Conference Wins in AI	1st and 2nd positions at Two-Day National Conference on Artificial Intelligence at Laureate Institute, Himachal
Full Club Calendars Operated	Sports, Cultural, Research, and Entrepreneurship Clubs each operated 20+ events throughout the year

INFRASTRUCTURE & FACILITIES

- Laboratory infrastructure upgraded with additional instruments for phytochemical and pharmaceutical analysis.
- Research Club inaugurated its dedicated activity space with regular journal-club meetings and methodology workshops.
- Library acquisitions expanded to include updated editions of core pharmacy texts and increased digital journal access.
- Campus facilities refreshed to support expanded co-curricular programmes, including upgraded sports and cultural facilities.

RESEARCH & PUBLICATIONS

- Multiple student dissertation projects completed and documented, with several leading to peer-reviewed publications.
- Student-authored publications appeared in the International Journal of Pharmaceuticals and Healthcare Research, Journal for Research in Applied Sciences and Biotechnology, and several other peer-reviewed venues.
- Book chapters contributed by faculty (Ms. Kriti Dabral, Ms. Yashika Uniyal, Dr. Nidhi Chatterjee) to Raghav Publication's volumes on Pharmacognosy fundamentals.
- Research methodology workshops expanded to cover statistical analysis tools (SPSS), reference management, and plagiarism detection.

STUDENT ACHIEVEMENTS

- Six students achieved 1st or 2nd position across cultural competitions at University-level inter-institute events.
- Participation in National Conference on Artificial Intelligence — 1st position by Harsh Gupta and 2nd position by Vipul Kumar.
- Twenty-plus student participations at inter-university sports and cultural events.
- Active role in state-level Working Model competitions, Poster Making, and Technical event participation.

COMMUNITY SERVICE & OUTREACH

- Health camps, blood donation drives, and awareness programmes conducted across the academic year.
- Extra-curricular programme expanded to include celebration of national and cultural days with increased student engagement.
- Entrepreneur Cell engagement with retail medical store industrial visits — providing students direct exposure to the business of pharmacy.
- Continued engagement with Pharmacy Council of India guidelines for community outreach and public service.

GOVERNANCE

The governance framework continued to operate smoothly under the direction of the Governing Body and the Principal. Quality assurance activities through the IQAC generated actionable recommendations for the subsequent year's planning, and faculty development programmes were expanded to support the growing teaching complement. Strategic discussions around institutional quality pathways continued, laying groundwork for future recognition milestones.

Global Pharma Developments

11 major developments that shaped the world of pharmacy during Academic Year 2023–24

The pharmaceutical profession is in constant evolution. The following pages document the most consequential developments worldwide during the period covered by this magazine — approvals, policy shifts, scientific breakthroughs, and industry transformations that our students and graduates will navigate throughout their careers.

Casgevy Approved — World's First CRISPR Gene-Editing Therapy

On 8 December 2023, the FDA approved Casgevy (exagamglogene autotemcel) for the treatment of sickle cell disease in patients aged 12 and older with recurrent vaso-occlusive crises. The approval marked the most significant moment in the history of CRISPR technology to date — the first ever regulatory authorisation of a therapy based on the Nobel-Prize-winning CRISPR-Cas9 gene-editing system. Developed jointly by Vertex Pharmaceuticals and CRISPR Therapeutics, Casgevy represented the culmination of more than a decade of translational work following the original 2012 publication of CRISPR-Cas9 as a programmable gene-editing tool.

Sickle cell disease is a devastating inherited blood disorder caused by a single-letter mutation in the beta-globin gene, leading to the production of abnormal haemoglobin that distorts red blood cells into a rigid sickle shape. The disease affects an estimated 100,000 Americans and millions globally, with the highest burden in sub-Saharan Africa and India. Casgevy works by extracting a patient's own haematopoietic stem cells, using CRISPR to edit the BCL11A gene — thereby reactivating the production of foetal haemoglobin, which does not sickle — and reinfusing the edited cells into the patient following myeloablative conditioning. The result is a functional cure for a disease that has until now been managed with transfusions, hydroxyurea, and occasional matched-donor bone marrow transplantation.

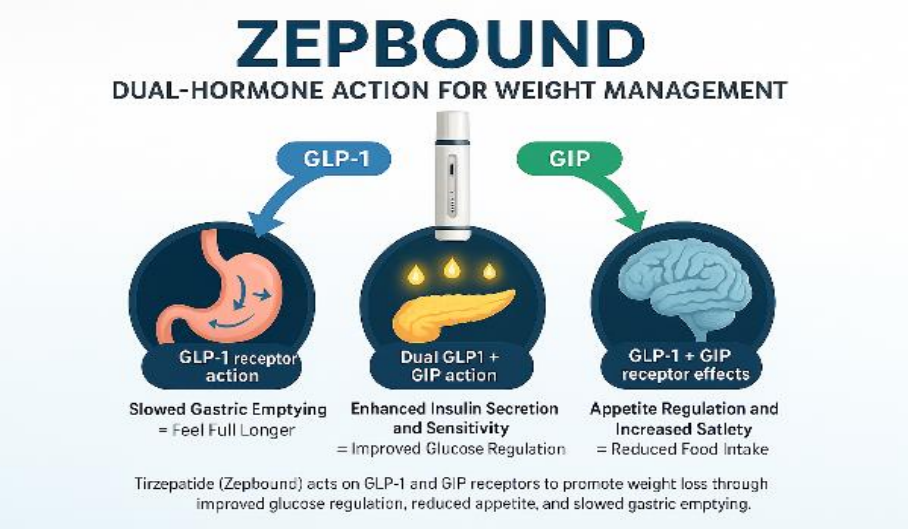
The Casgevy approval is foundational for the broader gene-editing field. It demonstrated that ex vivo CRISPR editing could be performed with acceptable safety and durable clinical benefit, opening the door to therapies for beta-thalassemia (approved concurrently), transfusion-dependent haemoglobinopathies, and a long pipeline of monogenic diseases. For India — where sickle cell disease is endemic in tribal populations and beta-thalassemia imposes a significant public-health burden — the Casgevy approval carries exceptional importance, though the initial USD 2.2 million list price poses serious access challenges. The Indian Council of Medical Research and several national biotechnology institutes have since accelerated indigenous gene-editing research, and the Indian Prime Minister publicly committed to eliminating sickle cell disease from India by 2047.

FDA Approves Zepbound — Tirzepatide Gains Obesity Indication in the United States

On 8 November 2023, the FDA approved Zepbound (tirzepatide) for chronic weight management in adults with obesity or overweight plus at least one weight-related comorbidity. Developed by Eli Lilly and previously approved in 2022 as Mounjaro for type 2 diabetes, tirzepatide is a first-in-class dual GIP/GLP-1 receptor agonist. The Zepbound approval opened the obesity indication to a molecule that had consistently outperformed semaglutide on weight-loss endpoints in head-to-head studies, triggering a reshaping of competitive dynamics in the fast-growing obesity therapeutics market.

In the pivotal SURMOUNT-1 trial, tirzepatide at its highest dose produced a mean 22.5% reduction in body weight over 72 weeks — approaching the efficacy historically associated only with bariatric surgery. The dual receptor mechanism — combining activation of the glucose-dependent insulinotropic polypeptide (GIP) receptor with that of the glucagon-like peptide-1 (GLP-1) receptor — appears to drive weight loss through complementary pathways involving appetite reduction, delayed gastric emptying, and metabolic effects on adipose tissue.

The Zepbound launch intensified what had become by late 2023 one of the most extraordinary commercial phenomena in pharmaceutical history. Manufacturing capacity for GLP-1-class drugs was strained globally, supply shortages persisted, and compounding pharmacies in the United States began producing unauthorised semaglutide and tirzepatide preparations — creating public-health and regulatory challenges. In India, the brand launch of Mounjaro for diabetes in early 2025 marked the first commercial availability of tirzepatide in the country, with obesity indication approval following. For Indian pharmacy practice, the obesity drug revolution has surfaced new questions — about injection-device training, adherence counselling for chronic lifestyle-related disease, off-label demand pressure, and the professional responsibility to counsel on nutritional and behavioural adjuncts rather than treating the drug as a standalone solution.



FDA Approves Kisunla (Donanemab) — Second Amyloid Antibody for Early Alzheimer's Disease

On 2 July 2024, the FDA approved Kisunla (donanemab-azbt), an amyloid-targeting monoclonal antibody developed by Eli Lilly, for the treatment of adults with mild cognitive impairment or mild dementia due to Alzheimer's disease. Kisunla became the second amyloid antibody in the U.S. market after Leqembi, further validating the amyloid hypothesis of Alzheimer's disease and providing clinicians and patients with a second disease-modifying option. A distinctive feature of the Kisunla approval is that treatment can be discontinued once amyloid plaques have been cleared, typically within 12 to 18 months — offering the prospect of time-limited therapy rather than indefinite dosing.

The pivotal TRAILBLAZER-ALZ 2 trial demonstrated that Kisunla slowed clinical progression of Alzheimer's disease by 35% in patients with low-to-medium tau pathology over 76 weeks. The ability to stop treatment once the biological target (amyloid plaques on brain PET imaging) is cleared represents a clinically and economically meaningful feature — addressing a longstanding concern about the sustainability of lifelong antibody infusions in a disease of such prevalence.

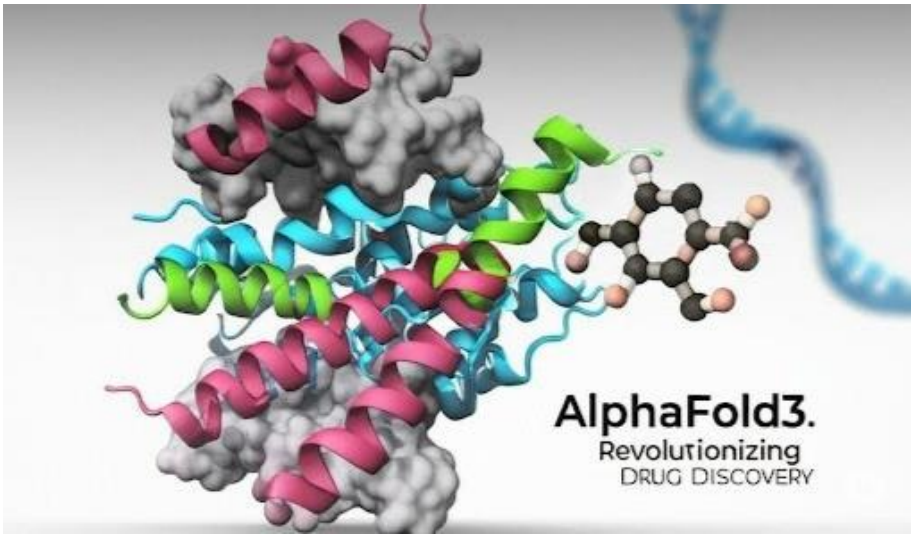
For the global pharmacy community, the Kisunla approval solidified the new paradigm of biomarker-guided, time-limited, disease-modifying antibody therapy in neurology. Challenges remain around infrastructure: amyloid PET scans or cerebrospinal-fluid testing are required to select appropriate patients; regular monitoring for amyloid-related imaging abnormalities (ARIA) requires MRI capacity; and the pricing and reimbursement frameworks are still evolving. In India, where the Alzheimer's and dementia-care burden is rising rapidly with demographic ageing, the Kisunla approval signalled a likely near-term demand for specialist neurology infrastructure — a demand that pharmacy graduates will increasingly be called upon to help meet as part of multidisciplinary dementia-care teams.

AlphaFold 3 Released — DeepMind's Protein Structure Model Expands to Complexes with Ligands and DNA

In May 2024, Google DeepMind and Isomorphic Labs released AlphaFold 3 — the next major evolution of the protein structure prediction model that had transformed structural biology following the 2021 release of AlphaFold 2. While AlphaFold 2 predicted the three-dimensional structures of individual protein chains with unprecedented accuracy, AlphaFold 3 extended the capability to predict structures of protein complexes, including those bound to small-molecule drugs, nucleic acids (DNA and RNA), ions, and post-translational modifications. This advance is of direct relevance to pharmaceutical science because drug discovery fundamentally depends on understanding how candidate molecules bind to their biological targets.

The practical implications for pharmaceutical research are substantial. Structure-based drug design, which historically required painstaking experimental crystallography or cryo-electron microscopy, can increasingly be performed in silico — accelerating hit identification, lead optimisation, and interpretation of structure-activity relationships. Pharmaceutical companies now routinely incorporate AlphaFold-generated structures into their discovery pipelines, reducing the experimental burden and opening targets that had previously been considered too difficult or too costly to pursue. Isomorphic Labs, DeepMind's drug-discovery subsidiary, announced major partnerships with Novartis and Eli Lilly totalling billions of dollars in potential value.

For pharmacy students and educators, the AlphaFold 3 release crystallised a broader shift in the scientific foundations of drug discovery. Medicinal chemistry and pharmacology curricula worldwide are evolving to incorporate computational skills — from molecular docking to machine-learning-based pharmacokinetic prediction — as foundational competencies rather than specialist add-ons. At GNCPS, faculty-led research directions have increasingly incorporated computational approaches, and the 2024 academic year saw growing student interest in the intersection of AI and pharmaceutical science. The AlphaFold story also represents a powerful demonstration of open science — the AlphaFold Protein Structure Database has released predicted structures for over 200 million proteins, freely accessible to researchers worldwide, including in low- and middle-income countries.



CDSCO Waives Local Clinical Trials for Select Drugs Approved in Major Jurisdictions

On 7 August 2024, India's Central Drugs Standard Control Organization (CDSCO) issued a significant regulatory order waiving the requirement for local clinical trials for drugs belonging to certain specified therapeutic classes that have already received regulatory approval from reference authorities in the United States, the United Kingdom, the European Union, Switzerland, Japan, or Australia. This marked a meaningful liberalisation of India's drug approval framework, with potentially far-reaching consequences for patient access, industry competitiveness, and the Indian pharmaceutical regulatory system's global positioning.

Historically, the requirement for local Phase III trials in the Indian population had been a source of delay in the availability of innovative foreign-developed therapies to Indian patients. The rationale for the requirement rested partly on genuine scientific concerns about inter-ethnic variation in drug response and partly on protectionist industrial considerations. The 2024 waiver, while limited to specified drug classes, signalled a willingness to trust the regulatory judgment of major international authorities and to accelerate patient access to globally-approved innovative medicines. The order was subsequently cited in the rapid Indian launches of Eli Lilly's Mounjaro (tirzepatide) and Johnson & Johnson's Darzalex (daratumumab) among others.

For Indian pharmacy students and faculty, the CDSCO order offered a case study in regulatory science and the trade-offs between innovation access, local safety evidence, and domestic industry protection. The order aligned with the broader ambitions of India's Vision Pharma 2047 initiative, which seeks to position the country as a global leader in innovative drug development, biosimilars, and advanced therapies — with the sector projected to reach USD 450 billion by 2047. GNCPS students preparing for careers in regulatory affairs, pharmacovigilance, or industrial pharmacy faced a rapidly modernising domestic regulatory landscape that will continue to evolve significantly through the latter half of the 2020s.

Humira Biosimilar Wave Reaches Critical Mass — Biosimilar Era Enters Maturity

By early 2024, nine biosimilars to AbbVie's Humira (adalimumab) — one of the world's best-selling drugs for over a decade, with peak annual sales exceeding USD 20 billion — had launched in the U.S. market following the original loss of exclusivity in early 2023. The biosimilar wave marked the maturation of the U.S. biosimilar pathway, more than a decade after it had been established under the 2010 Biologics Price Competition and Innovation Act, and represented the largest opportunity yet for post-launch biologic price competition in the United States.

Biosimilars are highly similar versions of originator biologic drugs, approved under abbreviated pathways that rely on demonstration of biosimilarity rather than independent efficacy trials. The scientific and regulatory challenge of biosimilars is far greater than that of small-molecule generics because biologics are large, complex molecules manufactured in living-cell systems, and apparently minor variations in manufacturing can produce differences in safety or efficacy. Successful biosimilar development requires sophisticated analytics, comparability studies, and — in most jurisdictions — clinical confirmation of equivalence in representative indications.

India has been a global leader in biosimilar development, with Biocon, Dr. Reddy's Laboratories, Intas, Zydus, and others producing biosimilars that have reached both domestic and international markets. In April 2024, Biocon Biologics and Eris Lifesciences announced a long-term collaboration to expand patient access to biosimilars in India across metabolic, oncology, and critical-care segments. For pharmacy practice globally, the maturing biosimilar era raises complex questions about interchangeability, automatic substitution policies, biosimilar naming, patient counselling about product changes, and pharmacovigilance for products that are distinct manufactured entities. Pharmacy graduates entering hospital practice in 2024 and beyond will increasingly find biosimilar selection and oversight a core responsibility.

FDA Approves First Gene Therapy for Metachromatic Leukodystrophy — Lenmeldy

On 18 March 2024, the FDA approved Lenmeldy (atidarsagene autotemcel) for the treatment of metachromatic leukodystrophy (MLD), a rare and fatal inherited neurodegenerative disease caused by deficiency of the arylsulfatase-A enzyme. Developed by Orchard Therapeutics, Lenmeldy is a one-time gene therapy administered to paediatric patients with pre-symptomatic or early-symptomatic MLD and works by introducing a functional copy of the ARSA gene into the patient's own haematopoietic stem cells ex vivo, followed by reinfusion following myeloablative conditioning.

MLD is a classic example of the diseases — rare, genetic, fatal, and untreatable by conventional pharmacology — for which gene therapy was originally conceived. Affected children typically develop progressive motor and cognitive deterioration in early childhood and rarely survive past adolescence. The Lenmeldy pivotal data demonstrated that appropriately-treated children retained motor function and cognitive development substantially above the expected natural-history trajectory, with some children developing normally over multi-year follow-up. For families of children with newly-diagnosed MLD, the availability of Lenmeldy represents a true therapeutic revolution.

The Lenmeldy approval is part of a broader wave of gene therapy authorisations that has characterised the mid-2020s — including Zolgensma (SMA), Luxturna (inherited retinal dystrophy), Elevidys (Duchenne muscular dystrophy), Casgevy and Lyfgenia (sickle cell disease), and others. Together these therapies represent the delivery of a decades-old promise of genetic medicine. For pharmacy practice, they demand specialist knowledge of ex-vivo manufacturing, conditioning regimens, integration-site monitoring, and long-term safety surveillance. They also surface fundamental access questions — Lenmeldy's approximately USD 4.25 million list price raises ethical and policy challenges that have no settled answers, and which pharmacy graduates entering the field will encounter throughout their careers.

IRA Drug Price Negotiation List Announced — First 10 Drugs Selected for U.S. Medicare Negotiation

On 29 August 2023, the U.S. Centers for Medicare and Medicaid Services announced the first 10 prescription drugs selected for Medicare price negotiation under the Inflation Reduction Act — a watershed moment in implementing the legislation that had been enacted the previous year. The list included blockbuster drugs addressing cardiovascular disease, diabetes, cancer, arthritis, and other high-prevalence conditions: Eliquis (apixaban), Jardiance (empagliflozin), Xarelto (rivaroxaban), Januvia (sitagliptin), Farxiga (dapagliflozin), Entresto (sacubitril/valsartan), Enbrel (etanercept), Imbruvica (ibrutinib), Stelara (ustekinumab), and the NovoLog/Fiasp insulin family.

Negotiations between Medicare and manufacturers proceeded through 2023 and 2024, culminating in the public announcement on 15 August 2024 of the agreed prices — which will take effect on 1 January 2026. The announced prices represented discounts of 38% to 79% from prior list prices, generating projected savings to taxpayers and patients that will begin accruing in 2026. The precedent established — of transparent, government-led price negotiation for high-cost prescription drugs in the United States — reshapes expectations about pharmaceutical pricing worldwide.

For Indian generic and biosimilar manufacturers, the IRA price negotiations represent both an opportunity and a risk. Lower originator prices could erode the commercial case for biosimilar and generic entry in some categories, while in others the compressed price structure will accelerate loss-of-exclusivity dynamics that favour low-cost manufacturers. For pharmacists globally, the IRA has increased professional attention to pharmacoeconomics, comparative effectiveness research, and health technology assessment. Indian pharmacy curricula — including at GNCPS — have begun to expand coverage of these topics in anticipation of their rising professional importance.

Oxford R21/Matrix-M Malaria Vaccine Recommended by WHO — Second Malaria Vaccine for Children

On 2 October 2023, the World Health Organization recommended the R21/Matrix-M malaria vaccine, developed by the University of Oxford and manufactured by the Serum Institute of India, for the prevention of Plasmodium falciparum malaria in children. R21/Matrix-M became the second WHO-recommended malaria vaccine, following RTS,S/AS01 (Mosquirix, by GSK) in 2021. The recommendation was of global public-health significance: malaria continues to kill approximately 600,000 children under 5 each year, overwhelmingly in sub-Saharan Africa, and the addition of a second WHO-prequalified vaccine was expected to dramatically expand global manufacturing capacity.

The R21/Matrix-M vaccine is a recombinant protein vaccine built on a modified hepatitis-B surface antigen scaffold displaying a portion of the malaria circumsporozoite protein, adjuvanted with Novavax's Matrix-M — the same saponin-based adjuvant used in Novavax's COVID-19 vaccine. Clinical trial data demonstrated vaccine efficacy of approximately 75% in areas with seasonal malaria transmission. Crucially, R21/Matrix-M is manufactured at scale by the Serum Institute of India — the world's largest vaccine manufacturer by volume — at a target price of USD 2 to USD 4 per dose, making it far more accessible than Mosquirix.

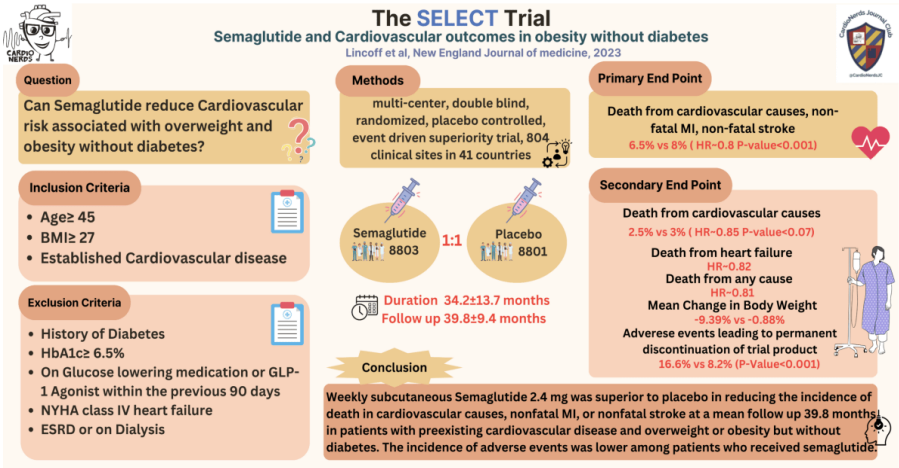
For India, the R21/Matrix-M story exemplified the country's growing stature in global health and vaccine innovation. The vaccine emerged from a long-standing collaboration between Oxford's Jenner Institute and Indian vaccine manufacturing, reflecting a model of global-South-led vaccine supply that has continued to mature in the years since. For pharmacy students and future professionals, the malaria vaccine programme highlighted the interdisciplinary nature of modern pharmaceutical practice — combining immunology, manufacturing scale-up, global supply-chain design, health economics, and international policy coordination. The vaccine's roll-out across eligible African countries began in 2024 and is expected to contribute materially to malaria mortality reductions over the remainder of the decade.

Obesity Drugs Enter Cardiovascular Indication — SELECT Trial Transforms Clinical Paradigm

In November 2023, the SELECT cardiovascular outcomes trial demonstrated that semaglutide 2.4 mg weekly (Wegovy) reduced the composite risk of cardiovascular death, non-fatal myocardial infarction, or non-fatal stroke by 20% in patients with pre-existing cardiovascular disease who were overweight or obese but did not have diabetes. The result, published in the New England Journal of Medicine, was a landmark for the cardiometabolic pharmacotherapy field and led in March 2024 to the FDA approving a cardiovascular indication for Wegovy — the first weight-loss drug ever approved for such use.

The implications of SELECT extended well beyond the specific molecule. The trial established that obesity pharmacotherapy, long viewed as cosmetic or quality-of-life medicine, could deliver hard clinical benefits on mortality and major cardiovascular events comparable to the best established cardiovascular drugs. This finding reshaped the therapeutic positioning of GLP-1 receptor agonists and informed subsequent trials demonstrating benefits in heart failure with preserved ejection fraction (STEP-HFpEF), chronic kidney disease (FLOW), and other conditions. By mid-2024, GLP-1-class drugs had accumulated the broadest and most consistent cardiovascular and renal outcomes evidence base of any drug class in modern pharmaceutical medicine.

For pharmacists worldwide, the SELECT results transformed counselling conversations around obesity pharmacotherapy. Patients and prescribers increasingly viewed these drugs not as weight-loss options but as disease-modifying therapy for the cardiometabolic syndrome — comprising obesity, diabetes, dyslipidaemia, hypertension, and cardiovascular and renal complications — that affects billions of adults globally. In India, where cardiovascular disease is the leading cause of death and where the obesity epidemic continues to accelerate, the clinical implications of the SELECT findings are especially consequential. The 2023-24 academic year witnessed the consolidation of GLP-1 receptor agonists as a foundational class of twenty-first-century pharmacotherapy, a position they appear likely to hold for the foreseeable future.

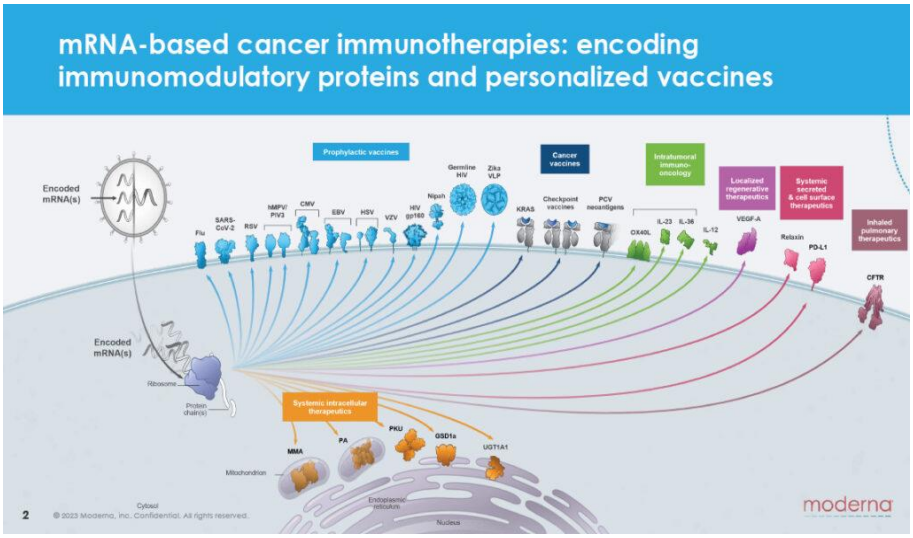


Personalised mRNA Cancer Vaccines Enter Phase III — Moderna/Merck Partnership Shows Promise

In the 2023-24 academic year, personalised mRNA cancer vaccines — a concept that had been discussed theoretically for years — crossed a decisive clinical milestone. The Phase II trial of Moderna's mRNA-4157 (V940), developed in partnership with Merck and administered together with the immune-checkpoint inhibitor pembrolizumab (Keytruda), demonstrated a 44% reduction in the risk of melanoma recurrence or death compared with pembrolizumab alone in patients with high-risk resected stage III/IV melanoma. The result, reported at the American Society of Clinical Oncology 2023 meeting and subsequently in peer-reviewed publications, catalysed a rapid move into pivotal Phase III trials.

The scientific logic of personalised cancer vaccines is both ambitious and elegant. Each patient's cancer contains unique mutations that produce abnormal proteins — so-called neoantigens — which can in principle be recognised by the patient's own immune system. A personalised mRNA vaccine encodes a selected set of neoantigens from that specific patient's tumour, priming a targeted immune response that complements checkpoint-inhibitor immunotherapy. The manufacturing logistics — sequencing the patient's tumour, selecting optimal neoantigens computationally, manufacturing and shipping a bespoke mRNA product — are extraordinary, but the rapid mRNA manufacturing platforms refined during COVID-19 made such logistics feasible at a scale that would have been unthinkable a decade earlier.

For the pharmacy profession, personalised cancer vaccines represent a convergence of biologics, computational oncology, immunology, genomics, and clinical pharmacy — a new kind of medicine that cannot easily be categorised within existing product classes. Oncology pharmacists in the coming years will increasingly participate in neoantigen selection review, turnaround-time management, cold-chain logistics for bespoke products, and pharmacovigilance for entirely novel immune mechanisms. In India, where the cancer burden is projected to reach 1.57 million new cases annually by 2025, the promise of personalised mRNA vaccines has catalysed domestic academic research and public-sector interest. Pivotal data from the Phase III INT2 trial and others are expected in 2026-27 and may usher in a transformative new pillar of oncology therapy.



Life Skills & Professional Development

14 curriculum-aligned workshops & seminars

A structured series of workshops and seminars delivered during the year to build the interpersonal, professional, and wellness capabilities expected of every modern pharmacy graduate.

LIFE SKILLS & PROFESSIONAL DEVELOPMENT

Curriculum-Aligned Workshops & Seminars · Academic Year 2023–24

Pharmacy education is as much about professional identity as it is about scientific knowledge. As part of the College's commitment to holistic professional development, a structured series of workshops, seminars, and wellness sessions was organised during Academic Year 2023–24 to build capabilities that complement the core academic curriculum — from physical well-being and mental resilience, to professional communication, leadership, ethics, digital fluency, and environmental consciousness. Each session was delivered by domain experts drawn from industry, professional bodies, and the College's own faculty. The pages that follow document these activities in compact form, with 14 sessions covered for the period of this magazine.

29 AUG 2023 · *Session #1*

Energize Yourself: A One-Day Yoga Session

Resource Person: Aishmit Arora, Startup Founder · **Students Present:** 55

A restorative session designed to address limited focus on physical and mental well-being in core curriculum. Participants practised breathing techniques, mindfulness, and gentle postures to build mental resilience and bodily awareness essential for sustained academic engagement.

Focus Area: *Limited focus on physical and mental well-being in core curriculum*

19 SEP 2023 · *Session #2*

Flexibility and Mobility Workshop

Resource Person: Shaily Bhatnagar, Career Counsellor · **Students Present:** 60

A practical movement workshop addressing need for holistic professional development beyond syllabus. Students learned techniques for maintaining physical mobility and postural health — critical for a profession that demands long hours of focused dispensing and counselling work.

Focus Area: *Need for holistic professional development beyond syllabus*

26 SEP 2023 · *Session #3*

Youth Ambassadors: Leadership Development Seminars

Resource Person: Anukriti Batra, CEO — PYM · **Students Present:** 68

A leadership development programme addressing limited exposure to leadership and team-building skills. Students engaged in experiential exercises that build confidence, collaborative decision-making, and the ability to take initiative — capabilities increasingly expected of pharmacy graduates.

Focus Area: *Limited exposure to leadership and team-building skills*

05 OCT 2023 · *Session #4*

Seminar on Conflict Reduction in Pharmacy Sector

Resource Person: Sunil Kumar Malik, VP CBC · **Students Present:** 59

A seminar targeting need for holistic professional development beyond syllabus. Participants explored practical strategies for managing interpersonal and workplace conflicts constructively — a skill essential in hospital, retail, and industrial pharmacy settings alike.

Focus Area: *Need for holistic professional development beyond syllabus*

25 OCT 2023 · *Session #5*

Yoga and Meditation for Inner Peace

Resource Person: Tanvir Shah, CSO — CBC · **Students Present:** 45

A restorative session designed to address limited focus on physical and mental well-being. Participants practised breathing techniques, mindfulness, and gentle postures to build mental resilience and bodily awareness essential for sustained academic engagement.

Focus Area: *Limited focus on physical and mental well-being*

26 OCT 2023 · *Session #6*

One-Day Workshop on Writing Skills for Pharma Practice

Resource Person: Shaily Bhatnagar, Career Counsellor · **Students Present:** 60

A skills workshop aimed at bridging insufficient emphasis on professional communication skills. Participants engaged in structured practice exercises in verbal and written communication essential for effective patient care, interprofessional collaboration, and professional documentation.

Focus Area: *Insufficient emphasis on professional communication skills*

27 NOV 2023 · *Session #7*

Interprofessional Communication in Pharmacy Sector

Resource Person: Aishmit Arora, Startup Founder · **Students Present:** 55

A skills workshop aimed at bridging insufficient emphasis on professional communication skills. Participants engaged in structured practice exercises in verbal and written communication essential for effective patient care, interprofessional collaboration, and professional documentation.

Focus Area: *Insufficient emphasis on professional communication skills*

20 DEC 2023 · *Session #8*

One-Day Software Training for Pharmacy Students

Resource Person: Sunil Kumar Malik, VP CBC · **Students Present:** 54

A hands-on technical session addressing limited exposure to modern digital and computing tools. Students gained direct exposure to digital tools and software platforms increasingly integral to modern pharmacy practice — from formulation design to electronic record-keeping.

Focus Area: *Limited exposure to modern digital and computing tools*

12 JAN 2024 · *Session #9*

Strength Training for Pharmacy Profession

Resource Person: Tanvir Shah, CSO — CBC · **Students Present:** 56

A wellness-focused programme targeting need for holistic professional development beyond syllabus. The session combined practical activity with guidance on lifestyle choices that support long-term physical and professional well-being for pharmacy practitioners.

Focus Area: *Need for holistic professional development beyond syllabus*

23 JAN 2024 · *Session #10*

Seminar on Time Management

Resource Person: Shaily Bhatnagar, Career Counsellor · **Students Present:** 43

A professional development workshop focused on need for holistic professional development beyond syllabus. The session equipped students with frameworks and tools to manage workloads, plan careers, and build the habits of lifelong learning expected of healthcare professionals.

Focus Area: *Need for holistic professional development beyond syllabus*

14 FEB 2024 · *Session #11*

Seminar on Patient Counseling Skills Development

Resource Person: Anukriti Batra, CEO — PYM · **Students Present:** 49

A skills workshop aimed at bridging insufficient emphasis on professional communication skills. Participants engaged in structured practice exercises in verbal and written communication essential for effective patient care, interprofessional collaboration, and professional documentation.

Focus Area: *Insufficient emphasis on professional communication skills*

15 MAR 2024 · *Session #12*

Yoga for Work-Life Balance

Resource Person: Shaily Bhatnagar, Career Counsellor · **Students Present:** 55

A restorative session designed to address limited focus on physical and mental well-being. Participants practised breathing techniques, mindfulness, and gentle postures to build mental resilience and bodily awareness essential for sustained academic engagement.

Focus Area: *Limited focus on physical and mental well-being*

17 APR 2024 · *Session #13*

Wellness Walk: Exploring Fitness Trails

Resource Person: Tanvir Shah, CSO — CBC · **Students Present:** 44

A wellness-focused programme targeting limited focus on physical and mental well-being. The session combined practical activity with guidance on lifestyle choices that support long-term physical and professional well-being for pharmacy practitioners.

Focus Area: *Limited focus on physical and mental well-being*

22 MAY 2024 · *Session #14*

Computer Skills for Pharmacy Students

Resource Person: Anukriti Batra, CEO — PYM · **Students Present:** 60

A hands-on technical session addressing limited exposure to modern digital and computing tools. Students gained direct exposure to digital tools and software platforms increasingly integral to modern pharmacy practice — from formulation design to electronic record-keeping.

Focus Area: *Limited exposure to modern digital and computing tools*

CAMPUS HIGHLIGHTS RECAP

The Year in Review — Academic Year 2023–24

Across the Academic Year 2023–24, Guru Nanak College of Pharmaceutical Sciences, Dehradun hosted 55 documented events, celebrated 10 student awards won at external competitions, and advanced numerous academic, research, and co-curricular initiatives. Each of these contributed to the rounded education that defines the GNCPS experience — an education in which classroom rigour, laboratory work, cultural celebration, sporting competition, and community service are understood not as separate activities but as integrated components of professional formation.

55	10	100%
EVENTS HELD	AWARDS WON	ENGAGEMENT

The events documented in our two companion newsletters for this academic year — carefully chronicling every seminar, workshop, celebration, sports tournament, cultural festival, award, and research activity — provide a detailed record of the year's institutional life. Highlights included the opening of the Research Club with systematic workshops on methodology and scientific writing, the steady calendar of Entrepreneurship Club events that pushed students toward founder-thinking, the full rhythm of Sports Club tournaments that energised the campus, and the Cultural Club's celebrations of every national and cultural occasion that punctuate the Indian academic calendar.

Beyond the organised calendar, this year was marked by the countless smaller moments that knit together the fabric of campus life — the late-evening laboratory work, the informal faculty-student conversations, the friendships that cross batches, the quiet personal milestones of students who grew into leaders of their clubs and their cohorts. These moments are harder to document but are in many ways the true heart of what makes GNCPS the institution it is.

FACULTY CORNER

Voices from the Teaching Community

The faculty of Guru Nanak College of Pharmaceutical Sciences brings together decades of collective experience in pharmaceutical education, research, and industry practice. In this feature, we share brief perspectives from members of our teaching community on the semester that has been — what stood out, what surprised them, and what they carry forward into the next.

"A pharmacy graduate is not merely a technician — they are a custodian of public health. Every seminar, every workshop we organise is designed with that larger purpose in mind, to shape graduates who understand both the science and the service aspect of our profession."

— Dr. S. Duraivel

Principal

"Watching students evolve over the semester — from tentative first-year participants to confident event organisers — is the most rewarding part of teaching. Our job is to create opportunities; they do the growing themselves, and the speed at which they grow never ceases to amaze me."

— Ms. Kriti Dabral

Associate Professor, Pharmaceutics

"Research projects at the undergraduate level do more than produce a thesis; they produce independent thinkers. Seeing our students pose their own questions, design their own experiments, and defend their own conclusions is watching future pharmaceutical scientists in formation."

— Mrs. Archana Rautela

Associate Professor, Pharmaceutics

STUDENT VOICES

Reflections from the GNCPS Student Community

A college newsletter would be incomplete without the voice of its students. In this section we share brief reflections from our students — on what the semester meant to them, on the events that left a mark, and on the friendships and learning that defined their time on campus during this period.

"What I carry away from this semester is not just the knowledge but the confidence. The Research Club workshops taught me to read a scientific paper critically, and I now feel ready to contribute my own research to the literature."

— Final-Year Student, B. Pharm

"The cultural events on campus gave me a chance to discover sides of myself I didn't know existed. I signed up for a dance performance as a dare and ended up helping coordinate three more. GNCPS has a way of drawing the best out of its students."

— Third-Year Student, B. Pharm

"The industry visits and seminars from external experts opened my eyes to the many career paths in pharmacy. I came to college thinking of one profession; I am leaving this semester with awareness of at least five."

— Second-Year Student, B. Pharm

"My induction at GNCPS set the tone for everything that followed. Seniors welcomed us warmly, faculty members were approachable, and by the end of the first week the campus felt like a second home."

— First-Year Student, B. Pharm

"Running the sports calendar this semester taught me more about leadership than any textbook could. Organising a tournament means handling logistics, motivating teammates, resolving disputes, and celebrating every victory as a collective win. I am grateful to the faculty advisors who trusted us with that responsibility."

— Sports Club Coordinator

"The pitch competitions pushed me out of my comfort zone. Standing in front of a panel of judges with just three minutes to sell your idea is terrifying — and exhilarating. Even when I did not win, I walked away with sharper thinking, better slides, and new friendships with fellow founder-students."

— Entrepreneurship Club Member

"Before this semester, publishing a paper felt like something only professors and post-graduates did. The Research Club's systematic workshops demystified the process, and our faculty mentors showed us that student-authored papers in indexed journals are not only possible but expected of serious students."

— Research Club Participant

PUBLICATIONS & RESEARCH OUTPUT

Scholarly Contributions — Academic Year 2023–24

The research output of Guru Nanak College of Pharmaceutical Sciences, Dehradun continues to grow in both volume and scholarly impact. Our faculty and students publish in peer-reviewed journals spanning pharmaceutics, phytochemistry, herbal drug development, water-quality research, nanoparticle science, clinical pharmacy, and pharmacognosy. Over the years chronicled in our magazine volumes, the College has authored or co-authored more than twenty research papers in Scopus and SCI-indexed journals and contributed over ninety book chapters to recognised pharmaceutical publications — an output that reflects both individual faculty excellence and the sustained research culture that the institution has built.

NOTABLE JOURNALS IN WHICH GNCPS WORK HAS APPEARED

- Water, Air, & Soil Pollution (Springer)
- Waterlines — peer-reviewed WASH journal
- ACS ES&T Water (American Chemical Society)
- Food Safety and Health
- Journal of Natural Remedies
- Journal of Chemical Health Risks
- Environment Conservation Journal
- International Journal of Pharmaceutical Sciences and Research
- Journal for Research in Applied Sciences and Biotechnology
- International Journal of Pharmaceuticals and Healthcare Research
- Catalysts (MDPI)
- Frontiers in Microbiology

Faculty contributions to the Raghav Publication volumes on Pharmacognosy — led by Ms. Kriti Dabral, Ms. Yashika Uniyal, and Dr. Nidhi Chatterjee — have produced thirty-seven authored book chapters, serving as reference material for pharmacy students across India. Students in the 2024-25 final-year batch produced multiple peer-reviewed publications emerging from their dissertation projects under the supervision of Ms. Kriti Dabral and Mrs. Archana Rautela.

A complete publications register is maintained by the institutional Research Committee and is available to all faculty, students, and visiting scholars. The register serves as the definitive scholarly record of the institution and is updated continuously as new publications appear.

LOOKING AHEAD

What the Coming Semester Holds

As this issue goes to press, preparations are already underway for the the next academic year at GNCPS, where the institutional momentum documented in this magazine will be built upon with fresh cohorts, new research programmes, and continued engagement with the global pharmaceutical profession. Our calendar includes continued sessions of the Research Club with a focus on advanced research methodology, regular Entrepreneurship Club events designed to stretch student thinking on venture creation, Sports Club tournaments that keep the competitive spirit alive across all four batches, and Cultural Club programmes marking the festivals and national days that punctuate the academic calendar.

Faculty members will continue to deliver research seminars on cutting-edge topics; guest speakers from the pharmaceutical industry, regulatory agencies, and academia will visit the campus through the Industry-Academia engagement cell; and students will participate in external competitions that carry the name of Guru Nanak College to the regional and national stage.

Readers of this newsletter can expect the next issue to document those months with the same care and warmth they have come to expect. Until then, we invite every member of the GNCPS family to engage enthusiastically with the opportunities the campus continues to offer.

CREDITS & ACKNOWLEDGEMENTS

Chief Patron

Hon. Bhupinder Singh Arora, Chairman — Guru Nanak Educational Trust

Patron

Mrs. Vineet Arora, COO — Guru Nanak Educational Trust

Editorial Advisor

Dr. S. Duraivel, Principal — Guru Nanak College of Pharmaceutical Sciences, Dehradun

Editor

Ms. Kriti Dabral, Associate Professor, Department of Pharmaceutics

Editorial Committee

Mr. Kashif Hussain, Vice Principal

Dr. Pankuri Hans, Professor and HOD

Dr. Nidhi Chatterji, Dean Admissions

Dr. Vishal Kamboj, Controller of Examinations

Dr. Lalit Kumar, Registrar

Student Editorial Team

Aman Raj — Student Editor

Shashikant Verma — Content Coordinator

Nikita — Design & Layout

Amit Thakur — Photography Coordinator

Photography Credits

All photographs are sourced from the GNCPS media archives with contributions from student volunteers and club photographers.

Published by

Guru Nanak College of Pharmaceutical Sciences, Dehradun

Jhajhra, Chakrata Road, Dehradun — 248007, Uttarakhand, India

Disclaimer

The content of this newsletter is compiled from institutional records, event reports, and inputs from faculty and student coordinators. While every effort has been made to ensure accuracy, the editorial team welcomes corrections and suggestions for future issues.

THE GNCPS CHRONICLE

Volume II — Annual Magazine

Academic Year 2023–24

> *"The secret of getting ahead is getting started."*
>
> *— Mark Twain*

GURU NANAK COLLEGE OF PHARMACEUTICAL SCIENCES

Jhajhra, Chakrata Road, Dehradun — 248007, Uttarakhand, India

Est. 2018 · Affiliated to VMSB Uttarakhand Technical University · Approved by PCI