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(Category -1, Deemed to be University estd. u/s. 3 of the UGC Act, 1956)
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OFFICE OF DEAN ACADEMICS

Policy Document

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Title: Multi-disciplinary, Cross-disciplinary, and Inter-disciplinary Curriculum Development

This policy provides a framework for integrating multi-disciplinary, cross-disciplinary, and inter-disciplinary approaches into curriculum design for programs at KL University. It ensures alignment with NEP 2020, promotes holistic learning, and includes contemporary technologies to foster innovation, employability, and sustainability. Engineering UG and PG

Multi-disciplinary Approach: Combining knowledge from multiple disciplines while maintaining distinct boundaries between them. For example, KL University's B.Tech program in Artificial Intelligence and Data Science includes courses from computer science, mathematics, and business analytics. Each discipline contributes its specialized knowledge to the overall understanding of AI and its applications.

Cross-disciplinary Approach: Using methods or concepts from one discipline in another without necessarily blending them. For instance, KL's BBA program integrates technical tools like data visualization software (from computer science) to enhance business decision-making processes. This allows students to apply computational skills to solve business challenges.

Inter-disciplinary Approach: Integrating knowledge and methods from different disciplines to create a unified perspective. An example is KL's M.Tech in Construction Technology & Management, which combines urban planning, IoT, and environmental science to design sustainable and technologically advanced urban spaces.

Programs designed with these approaches encourage students to develop diverse skill sets, such as:

- Multi-disciplinary: A B.Tech program in IoT includes courses on embedded systems, data analytics, and network security, each taught as distinct but complementary areas.

- Cross-disciplinary: A course on Intellectual Property Rights in Technology incorporates legal principles into the engineering curriculum, addressing regulatory issues for technological innovations.
- Inter-disciplinary: A Master's program in Robotics and Automation integrates mechanical engineering, computer science, and AI into a cohesive learning experience focused on building autonomous systems.

1. Curriculum Design Principles

1.1 Alignment with NEP 2020

- Embed sustainability, ethics, and social responsibility in all programs. For instance, ensure that engineering courses include modules on sustainable energy systems and environmental impact assessments.
- Foster student-centric and flexible learning paths through credit-based systems, enabling learners to choose minors and electives across various domains.

1.2 Stakeholder Engagement

- Include inputs from industry, academia, alumni, and students during program development. For example, involve industry partners to co-develop a curriculum for KL's advanced manufacturing and robotics programs.
- Benchmark against global standards such as QS Rankings, UGC guidelines, and SDGs to maintain relevance and competitiveness.

1.3 Contemporary Relevance

- Integrate cutting-edge technologies like AI, blockchain, robotics, and IoT into curricula. Programs should incorporate practical projects, such as developing blockchain-based financial systems or designing IoT-enabled agricultural devices.
- Include emerging societal and industry challenges, such as climate change mitigation or digital security, to ensure graduates are future-ready.

1.4 Learning Pathways

- Offer students the flexibility to pursue minors, specializations, or certifications across disciplines. For instance, a student majoring in Electronics and Communication Engineering can opt for a minor in AI.

- Enable "Design Your Degree" options, allowing students to customize their academic journey. For example, a student can combine courses in AI, healthcare informatics, and entrepreneurship to align with career goals in health-tech startups.

1.5 Integration of SDGs

- Map courses and projects to specific SDGs. For example:
    - SDG 3 (Good Health and Well-being): Develop a curriculum in Biomedical Engineering focused on designing low-cost prosthetics.
    - SDG 7 (Affordable and Clean Energy): Include projects on solar energy optimization and smart grid technologies.

2. Implementation Strategies

2.1 Program Structure

- Core Modules: Emphasize foundational courses specific to the primary discipline. For instance, the B.Tech program in Computer Science includes core modules such as Data Structures, Algorithms, and Operating Systems.
- Skill Development: Integrate industry-relevant practical skills such as AI model deployment, IoT sensor programming, and blockchain smart contract development. For example, the M.Tech in AI includes skill development courses on TensorFlow and PyTorch.
- Electives: Provide electives that cross traditional boundaries, such as a Data Analytics elective for Mechanical Engineering students or a Legal Tech elective for Computer Science students.
- Capstone Projects: Projects must solve inter-disciplinary problems, like developing IoT-based healthcare solutions or smart mobility systems integrating AI and mechanical design.

2.2 Multi-disciplinary Cohorts

- Facilitate collaborations across diverse departments through specialized cohorts. Examples include:
    - Artificial Intelligence & Smart Systems: Includes students from Computer Science, Electronics, and Data Science.
    - Robotics & Precision Agriculture: Combines expertise from Mechanical Engineering, Agriculture, and Data Analytics.

- Digital Twin for Smart Cities: Merges Civil Engineering, IoT, and Environmental Science to address urban development challenges.

2.3 Learning Methods

- Experiential Learning: Establish dedicated labs like the NVIDIA AI Lab and the IoT Development Lab for hands-on learning.
- Problem-based Learning: Include real-world challenges in the curriculum, such as developing renewable energy solutions in collaboration with industry partners.
- Research-driven Learning: Collaborate across departments for research projects. For example, a joint research initiative between the Mechanical and Computer Science departments on autonomous vehicles.

2.4 Credit Framework

- Adhere to the Choice-Based Credit System (CBCS), allowing students to select up to 20% of their credits through cross-disciplinary or online courses such as MOOCs from Coursera and edX.
- Implement the Academic Bank of Credits (ABC) system to provide flexible entry and exit options, enabling students to earn micro-credentials while pursuing their degree.
- Recognize credits from internships, projects, and certifications in emerging technologies such as cloud computing and DevOps.

3. Governance and Oversight

3.1 Curriculum Design Committee (CDC)

- Composed of faculty, industry experts, alumni, and student representatives.
- Responsibilities:
  - Align curriculum with NEP and industry standards.
  - Ensure cross-cutting themes (e.g., ethics, sustainability) are integrated.

3.2 Approval Process

- Departments draft curriculum and present it to the Board of Studies (BoS).
- Post BoS approval, the Academic Council provides final validation.

3.3 Continuous Improvement

- Conduct annual curriculum reviews based on feedback from stakeholders.
- Use data-driven insights from student performance, placement outcomes, and industry trends to make revisions.

4. Examples of Multi-disciplinary Integration

- Engineering & Healthcare: Develop AI-powered diagnostic tools for medical imaging.
- Computer Science & Agriculture: Build IoT systems for precision irrigation and crop monitoring.
- Business & Technology: Integrate fintech solutions in KL's management curricula to align with industry needs.

5. Monitoring and Evaluation

- Establish KPIs such as:
- Number of inter-disciplinary projects completed.
- Student enrollment in cross-disciplinary electives.
- Graduate employability and entrepreneurial ventures.
- Conduct periodic audits to measure adherence to this policy.

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