

## RESEARCH MISSION

SEPS research missions are-

The School of Engineering and Physical Sciences (SEPS) at North South University aims to be the center of excellence in innovation, technology, and entrepreneurship through cutting-edge research in the fields of engineering, computing, architecture, and physical sciences.

The school aims at working in line with Bangladesh's national research strategy and fostering the achievement of national, regional, and global sustainable development goals.

In order to achieve these goals, the school will pursue interdisciplinary research to find out practical, economical, and sustainable solutions to society's critical and unique challenges.

SEPS will also foster inter-institutional and international cooperative and collaborative research opportunities, spur local science and technology innovation through international research collaboration, and promote and disseminate research outcomes benefitting the national, regional, and global community.

The school will continue working on enhancing capacity building in research by developing field-specific research groups and centers, as well as university-wide research institutes.

## 2. RESEARCH PRIORITIES:

With a vision to foster the achievement of national, regional, and global sustainable development goals, North South University aspires-

Cutting-edge research in engineering, computing, architecture, and physical sciences, especially in the fields of machine learning and data science, artificial intelligence (AI), robotics, communication and signal processing, cyber securities, advanced transportation, urban heritage & planning, biomedical physics, CFD, and computational and applied mathematics.

Interdisciplinary research to address critical and unique challenges of society, such as Waste materials in concrete production, Biomedical Engineering, high-performance computing (HPC), etc.

Extend collaboration among SEPS researchers beyond internal inter- and intra-departmental partnerships to include both local and international individuals as well as public and private agencies, such as MOUs with local and international universities and NGOs.

Promote and disseminate research outcomes through peer-reviewed indexed journal publications and conference presentations for the benefit of the national, regional, and global community.

### 3. RESEARCH FACILITIES (INSTITUTES, CENTERS, GROUPS)

#### SEPS Current Research Facilities:

A High-Performance Computing (HPC) Facility.

Center for Applied and Computational Science (CACS).

Center for Infrastructure Research and Services (CIRS).

35 research groups.

Apurba-NSU R&D Lab (Machine Learning & AI).

Cyber-Physical System Lab.

Design Inclusion and Access Lab.

Mobile Application and Game Testing Lab.

Optics Lab.

Machine Intelligence Lab.

Intelligent Robotics Lab.

Building Research Lab.

Architectural Model Making Workshop.

Civil Engineering Design and Computing Lab.

#### Planned Research Facilities:

Institute for Artificial Intelligence.

Higher Performance Computing (HPC) Facility (2nd Unit).

Urban Heritage and Planning Research Lab (Architecture)

Energy and Systems Lab (Architecture)

Fabrication lab (Architecture)

#### 4. SEPS RESEARCH STRATEGY FOR 2024-2028

The core activities of SEPS research are performed by its four academic departments, namely, the Department of Electrical and Computer Engineering (ECE), the Department of Civil and Environmental Engineering (CEE), the Department of Mathematics and Physics (DMP), and the Department of Architecture. The core research areas are broadly categorized as Engineering, Technology, Architecture and Physical Sciences (Computer, Mathematics and Physics).

**Enhance Quality Research:** Place a priority on interdisciplinary research that creates synergies among the expertise existing across the School while also building bridges to complementary research expertise elsewhere;

**Promote Research Facilities:** Consolidate, integrate, and strategically expand the current research projects and develop new facilities for state-of-the-art research across the school. This strategy includes establishing new research labs and research centers; facilitate high-performance computing, internal and external research grants hunting, providing journal subscription fees and conference travel grants, etc.

**Recruit Research Active Staff:** Recruit the most talented research-active faculty and graduate research assistants to contribute diverse and complementary abilities to the work of our School. This strategy includes research-active faculty recruitment, full-time graduate research assistant appointment, engage research active scholars at various academic programs, hire visiting research scholars for short-term period, etc.

**Extend Collaborations:** Enhance mechanisms and channels for academic and industrial communication and collaboration. This strategy might include course planning in curricula, industry-based research, internship, invitation of guest lectures, industry visits,

**Incentivize Research:** Recognize and reward achievement across all aspects of the research work of the School and maximize opportunities as recognition of disciplinary and/or inter-disciplinary research contributions from faculty, staff, and students. This strategy includes monetary and non-monetary incentives, such as special increment(s), prize money, course load release, benefits in academic promotion and additional credit in faculty performance evaluation system, etc.

The core research areas are broadly categorized as Engineering, Technology, Architecture, and Physical Sciences (Computer, Mathematics, and Physics). The full-time faculty members of SEPS make up the most research-active pool of faculty at North South University.

