Education at NUTECH and Academic System

1. NUTECH is a "University for Industry". Its academic system and curriculum enable students to learn about the needs of society, in order to bring comfort in life, learn about how industry can play its role to bring comfort in the lives of based on such citizens and knowledge design industrial systems and implement, develop and create related technologies. It all depends on the nature and level of a particular academic program. The academic system and curriculum help students develop strong fundamental concepts in sciences, arts, humanities, social sciences, engineering, technology, skills, management and other areas of scholarship and help produce creative and innovative graduates with strong moral and ethical values and character. In a nutshell, NUTECH academic system and curriculum are built around creativity, innovation, knowledge creation and strong academia-industry linkage. NUTECH academic system is semester based. Academic year of UG programs less BET comprise of four terms. These are:

   a. Fall term of 17 weeks
   b. Industrial and Creative Activities Term (ICAT) term of 4 weeks for natural sciences, engineering, Society and Creative Activities Term (SCAT) for Social Sciences, Humanity and Creative Activities Term (HCAT) for humanities, Developmental and Creative Activities Term (DCAT) for arts, Management and Creative Activities Term (MCAT) for management sciences and Entrepreneurship and Creative Activities Term (ECAT) for business studies students.
   c. Spring term of 17 weeks, and
   d. Summer Session Term (SST) of 8 weeks.

2. Fall, ICAT/ SCAT/ HCAT/ DCAT/ MCAT/ ECAT, spring and summer session terms are referred to as T1, T2, T3 and T4, respectively. However, there are no ICAT or SST for BET programs. Instead BET programs have Industry Experience Semester (IES) of 12 x weeks as third term in a year. Fall and spring are regular semesters, and run as 16 weeks of teaching and 1-week of examination. ICAT/ SCAT/HCAT/DCAT/MCAT/ECAT and summer terms are of 4 and 8 weeks, respectively. The 'Fall' term begins in September and spring term begins in February. Summer session term is primarily dedicated for innovative individual projects of students related to the resolution of specific industry / society problems directly concerning particular undergraduate program. Regular subjects of any academic program are in general, offered during fall and spring terms. During ICAT/ SCAT/ HCAT/ DCAT/ MCAT/ ECAT, undergraduate

students do creative and innovative industry/ society/humanity/ developmental/management/business focused projects and independent activities based on their personal interests; graduate students may participate in various activities/ subjects/ courses as per their personal goals and agendas. In general, at the University, the word Course (capitalized) refers to an organized curriculum leading to a specified degree; otherwise the word course (lower case), or subject, refers to the individual class. NUTECH academic subjects are described both in terms of credit hours and units. Credit hour and units are defined below.

3. **Credit Hours**. The concept of credit hour in different settings is as follows: -

   a. **1-Credit (Theory)**. One (01) hour of teaching each week for a minimum of 16 weeks in a semester.

   b. **1-Credit (Lab)**. Three (03) hours of lab work each week for a minimum of 16 weeks in a semester.

   c. **1-Credit (Industrial / Field / Organizational Work/ Project)**. 40-80 hours of work in industry (for science, engineering and engineering technology students) in a semester.

4. During ICAT/ SCAT/HCAT/DCAT/MCAT/ECAT and SST, the total contact hours for a subject are equivalent to that of fall and spring semesters (based on 16 weeks of teaching). For example, for a 2-credit hours theory subject in fall semester, total contact hours = 2 hours/week x 16 no of weeks = 32 hours. For the same subject during the 4-week ICAT/ SCAT/HCAT/DCAT/MCAT/ECAT, total contact hours = 8 hours/week x 4 weeks = 32 hours.

5. **NUTECH Learning Approach**. NUTECH UG / PG / Skills education is built around creativity, innovation, and strong academia- industry linkage and is based on the concept of Learning by Doing (LbD). Like its unique and diversified curriculum NUTECH has technology driven and learning focused approach to learning. Based on reputed international practices learning approached is a blend of classroom teaching and outside class learning. NUTECH UG / PG / Skills academic system is committed to provide every UG / PG / Skills student with an outstanding education, grounded in basic, social, applied sciences, engineering, technology and hi-tech skills that will: -

   a. Prepare the students to meet the challenges of a professional and personal life.

   b. Inspire self-learning and peer-learning.

c. Help to develop creative, critical and innovative thinking and encourage students' inquisitiveness through various Out-of-Class Learning Experiences (OCLE).

d. Recognize the importance of intellectual and operational connections, discoveries, innovations and acquisition of skill-set outside the classroom.

e. Strengthen respect for diverse cultures.

f. Appreciate value of divergent views.

g. Help develop industrial leadership, professional abilities, management and supervisory skills.

6. NUTECH UG academic year (less BET) is comprised of four terms. In case of BET programs, the academic year has two academic semesters and one industry experience semester (IES) in a year. Fall and spring are regular semesters and are run as 16 weeks of teaching and one week of examination. Regular subjects are offered during fall and spring terms. During ICAT / SCAT / HCAT / DCAT / MCAT / ECAT undergraduate students are required to do creative and innovative projects and independent activities based on their personal interests. Summer term encourages students to undertake industry / field projects and internships apart from academic improvements.

NO OF WEEKS IN EACH TERM AND BREAKS						
Fall Semester	Break	*ICAT/ SCAT/HCAT/ DCAT/MCAT /ECAT	Spring Semester	Break	Summer	Break
17	2	4	17	2	8	2

*Industrial and Creative Activities Term (ICAT) term of 4 weeks for natural sciences, engineering, Society and Creative Activities Term (SCAT) for Social Sciences, Humanity and Creative Activities Term (HCAT) for humanities, Developmental and Creative Activities Term (DCAT) for arts, Management and Creative Activities Term (MCAT) for management sciences and Entrepreneurship and Creative Activities Term (ECAT) for business studies students.

7. **Structure of NUTECH UG & PG Curricula**. These have been modeled along the best UG and PG programs in the world. NUTECH UG and PG programs are somewhat flexible due to inclusion of elective subjects and concept of choosing specialized streams based on self-interest and personal talent as these are the edifice of creation and development of industrial and societal systems, related technologies and hi-end skills. In addition to developing expertise in the chosen field through regular subjects, students are given opportunities for broad learning to become

intellectual leaders, problem solvers and responsible and useful members of the society through various Outside Class Learning Experience (OCLE) programs.

8. **Design of UG Classroom Learning System (UCLS)**. The UG Classroom Learning System (UCLS) at NUTECH is graphically shown in **Figure-1**. The unique design of UCLS is a 5-step learning cycle with progressive learning steps: -

a. **Step-1**. Conceptual / theoretical foundation is established in the class through lectures and tutorials by the respective instructors.

b. **Step-**2. Proof-of-Concepts (PoC) of taught theoretical concepts in the class are to be provided by the instructor at the respective labs inside the University. PoC under ideal/ lab environment is to be provided.

c. **Step-3**. Applications of taught concepts in the class and PoC are to be explained in the context of realistic conditions in the local industry / field / relevant institution / organization / system by organizing / conducting proper academic classes and assessments.

d. **Step-4**. In the backdrop of already learnt concepts, PoC and reality based learning in steps 1-3, the students are to study the related concepts in the context of contemporary international leading industry / organizations / institutions and their systems as per the allocated time by respective instructors.

e. **Step-5**. The students are required to present before their instructors what they learnt sequentially from steps 1-4 in the graded activity to be termed as T^3S (Teach-the-Teacher Seminar). They are to explain and bring out the gaps which exist in their learning curve in terms of latest advancements in knowledge around the world.

9. **Design of PG Classroom Learning System (PCLS)**. The post graduate (PG) Classroom Learning System (PCLS) at NUTECH is a 3-step learning with progressive learning steps. PCLS is graphically shown in **Figure-4** and briefly explained below: -

a. **Step-1**. Conceptual / theoretical foundation at the advanced level is established in the class through lectures and tutorials by the respective instructors.

b. **Step-2**. In the backdrop of already learnt advanced level concepts in step-1, the PG students are to study the related advanced concepts in the context of contemporary international leading research labs / centers / organizations / industry / institutions and their systems as per the allocated time by respective instructors.

c. **Step-3**. The PG students are required to present before their research group chairman / faculty supervisor / instructors what they learnt in steps 1-2 in the Graded PG research Seminar Activity to be called as PG Research Knowledge Exploration Seminars (RKES).

Figure-1: UG Classroom Learning System (UCLS)

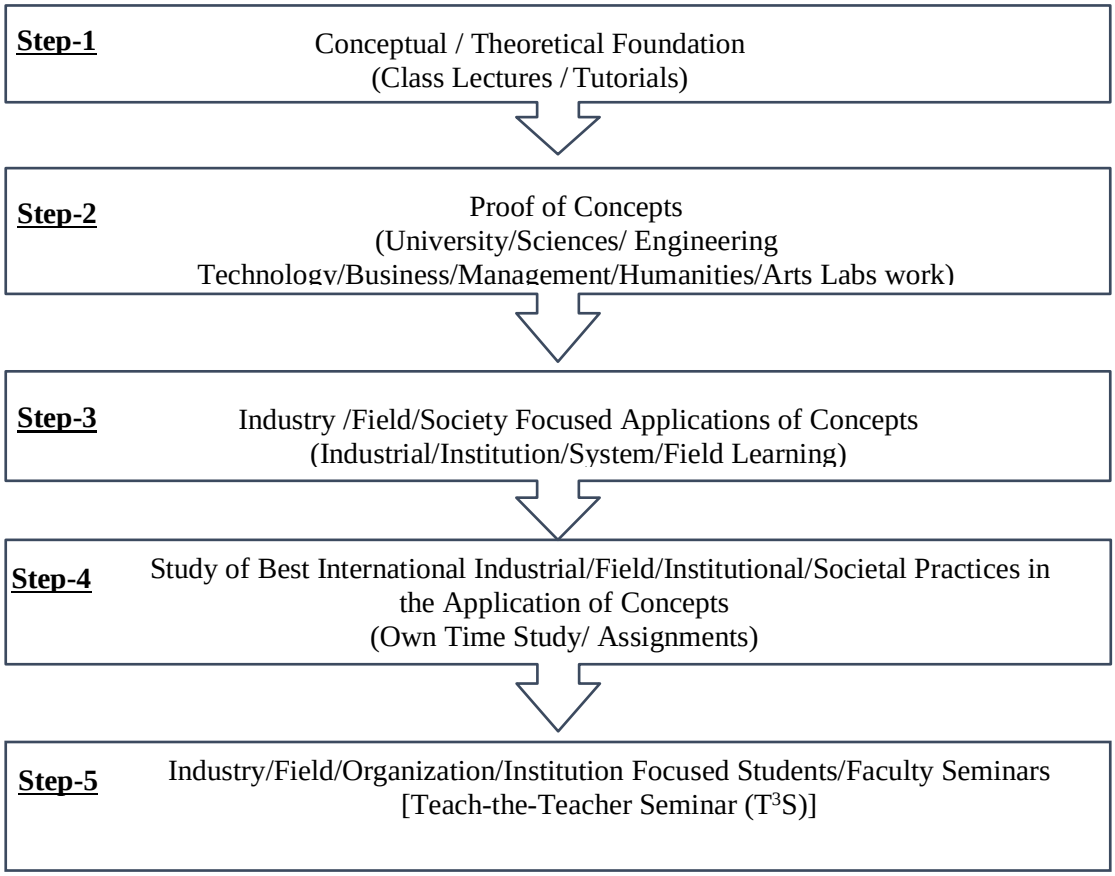
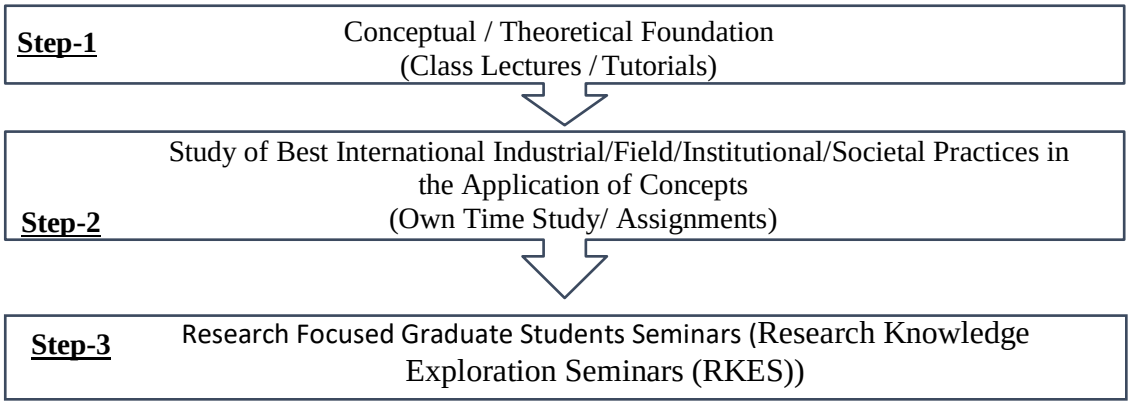


Figure-2: PG Classroom Learning System (PCLS)



Students Competence Index (SCI) in UG Programs

10. **Concept of SCI in NAS**. For NUTECH academic programs of under graduate education to establish their real credentials, NAS advocates the development and establishment of UG students competence index (SCI) systems at NUTECH. SCI is conceived to enable UG students perform equally well in all shades of their academic learning in line with best international practices of leading international technology universities. As UG students are presumably potential researchers, innovators and technology developers as doctoral/ post-doc research scholars in future, SCI as a concept should prepare them accordingly for the future. In SCI, apart from academic performance evaluation through grades/ GPA etc, the students are required to do equally well in terms of their doing projects for industry / field/ organizations, active participation and contribution in creative activities at different societies, application of upcoming, emerging and available technologies for the benefit of society / communities, learning about sports/ athletics and attaining mastery in at least one of the learnt sports. The concept is graphically shown in **Figure-5**.

Figure-5: STUDENTS COMPETENCE INDEX (SCI)

11. **Implementation of SCI System.** NAS envisages comprehensive design, implementation plan and standard procedures to realize the concept of SCI system in true letter and spirit. In this context following aspects are considered for an effective SCI system at NUTECH under the direct supervision and patronage of Dean of Undergraduate Education (DUE): -

a. SCI is made part of outcome based education (OBE) system of NUTECH.

b. The system has following five distinct components of assessing the competence level of students: -

(1) **Academic GPA / Grades.** It constitutes maximum 50% weightage in the overall index of the student. SGPAs and CGPA are converted into points of the score table.

(2) **Industry/ Field/ Organization Project**. In all the UG programs the students in all the four academic years are provided sufficient opportunities to do industry projects in either industry, field or any organization. Every project a student does earns him a definite score to be decided by the concerned departmental faculty / HoD through well-defused standard operating procedures.

(3) **Creative / Innovative Activities/ Societies Score**. All UG students are required to undertake innovation driven activities and projects as part of different societies and communities at NUTECH. The concept of innovation is practiced in all forms of academics as well as out-of-class learning experience based activities. Proper standard assessment system and procedures are devised to let students earn innovation scores for all creative activities.

(4) **Technology Service for Society Score.** All UG students are encouraged to identify technology(s) for their possible and preferably innovative use for the welfare and comfort of common citizens, communities and society at large. Through such activities they earn score as per pre-determined formula in terms of impact.

(5) **Learning of Sports / Athletics**. In the freshman year all students are required to learn the rules, procedures and basic techniques of sports / athletics of their choice in four different fields. Office of Physical Education (OPE) offers proper theory and lab classes at a ratio of 30% vs 70% in all the four terms of freshman year. Through assessment / exam every student is required to pass/ quality exam in his/her selected four sports / athletics and earn four points respectively. PED shall devise proper agreement

system for all UG students in achieving excellence in chosen sports/ athletics in four years.

c. SCI system components have following weightages: -

(1)	SGPA/ CGPA	-	50%
(2)	Industry/ Field/ Organization Project	-	20%
(3)	Create Activities / Innovation	-	10%
(4)	Technology Service for Society	-	10%
(5)	Learning of Sports/ Athletics	-	10%

d. All UG students are required to earn at least pass/ qualifying grades in all five components of SCI system. Failure to secure pass/ qualifying grade/ score in any of the components of SCI system makes a student ineligible for the award of bachelor degree.

e. All types of UG education programs are designed based on SCI system and position of students in the order of merit shall be worked out based on their performance in SCI including the award of Gold and Silver medals on graduation.

NUTECH Learning by Doing (LbD) Initiative

12. The University provides ample opportunities to the UG, PG and skills students to learn by doing. Under learning by doing initiative, the university offers comprehensive industry and society based sciences, engineering, technology, skills and entrepreneurship driven programs. These programs are described in succeeding paragraphs.

13. **UG Outside Class Learning Experience (UOCLE)**. NUTECH UG curriculum is broadly divided into two major learning segments of regular subjects and additional academic programs termed as UG Outside Class Learning Experience (UOCLE). Outside Class learning is an engaged learning process whereby students “learn by doing” and by reflecting on the experience. The high end taught theoretical and lab content as well as the UOCLE contribute towards the overall learning cycle. UOCLE sets apart NUTECH from university education elsewhere in Pakistan. There are a number of UOCLE each offered at a specific stage of UG degree. In addition to regular subjects like other universities, NUTECH undergraduate curriculum also includes some additional programs each with a specific objective. Each of the Outside Class Learning programs has its own specific learning objectives.

a. NUTECH Learning Communities Program (NLCP) is designed for Freshmen

b. NUTECH Personality Development Program (NPDP) is also designed for Freshmen

c. NUTECH Career Acceleration Program (NCAP) is offered to Sophomores

d. NUTECH Science/ Engineering/ Technology/ Humanity/ Arts/ Management/ Societal Leadership Program (NESP/ NELP/ NTLP/ NHLP/ NALP/ NMLP/ NSLP) in third year and fourth year of UG Degree for Juniors & Seniors

e. Undergraduate Research Experience Program (UREP) in third year and fourth year of UG Degree for Juniors & Seniors

f. Industrial/ Field/ Societal Learning Experience Program (ILEP/ FLEP/ SLEP) is offered every year for four years.

g. Four week Industrial and Creative Activities Term (ICAT), Society and Creative Activities Term (SCAT), Humanity and Creative Activities Term (HCAT), Developmental and Creative Activities Term (DCAT), Management and Creative Activities Term (MCAT) and Entrepreneurship and Creative Activities Term (ECAT) for sciences, engineering, technology, Humanities, Arts, Social Sciences, Management Sciences, Business Studies are offered every year for four years. Three such terms are mandatory for students of respective departments / programs in their 4-years of UG studies.

14. **<u>NUTECH Learning Communities Program (NLCP)</u>**. NUTECH Learning Communities Program is for NUTECH freshmen. The objectives of NLCP are:

a. To give students an in-depth and broader understanding of natural sciences, humanities, arts, social sciences, management sciences, business studies and their relationship with and importance in engineering and technology fields,
b. To ensure students' advising about studies at university, life at university and career path, and
c. Facilitate students' networking with faculty, upper class students (sophomore, juniors, seniors), alumni and fellow students.

15. By end of 1st week of fall semester, freshmen are required to enroll in one of the following initially established NUTECH learning communities:

a. Geo Tech Community (GTC).
b. Collaborative Learning Community (CLC).
c. Sciences and Sociology (S^2) Community.
d. Media, Arts, Sciences and Technology (MAST) Community.

16. These multi-disciplinary learning communities have their own nominated faculty, staff, meeting places and methods of operation. In these programs, students are required to make progress comparable to that of other freshmen, but the manner in which individual university requirements are met vary from program to program and among students within the same program. In all four communities, there are high level of student faculty interactions. Becoming member of one of the communities is mandatory for the students. Students have to register for the subjects of respective communities, and required to attend recitations/ tutoring, seminar series, social events, trips, excursions. Students enrolling in specific subjects/ seminars are graded on Pass/NR basis; however, letter grades obtained by students will count towards the computation of students competence index (SCI). Attendance and satisfactory completion of one year learning communities program are mandatory. Students who fail to complete any of the components of the learning community program are required to repeat that component whenever a repetition opportunity is given. In case of repetition, it is permitted to require students complete assignments/ projects/ activities in lieu with the approval of Dean Undergraduate Education. Students failing to complete the NLCP are not eligible for merit-based and need-based scholarships and honors and awards. Competent authority may also approve ineligibility to enroll in Sciences and PIMHASS subjects in the succeeding semester/ semesters and withdrawal of any of the other University's privileges (e.g., hostel facility), when and where deemed necessary.

17. **Sciences and Sociology (S^2) Community**. S^2 focuses on integration of disciplines, and teaching sciences and humanities within the broader human framework. This is a community of students and faculty dedicated to exploring the fundamental questions at the heart of all serious human inquiry. The salient aspects are:

a. S^2 community raises questions and encourages debate about human nature, ethics, liberty, human well-being, the role of science in the society and application of science in daily life.

b. The program offers classes with rigorous instruction in the sciences and mathematics, as well as in the humanities.

c. S^2 community offers 2-credits (6 units) **seminar series** both in Fall and Spring semesters wherein students have close interactions with the instructors and fellow students and benefit from presentations by prominent guest speakers in diverse fields from NUTECH and elsewhere.

d. All S^2 students are required to take at least two subjects within S^2 excluding one humanities subject.

e. The program's facilities lie at the NUTECH campus and consist of a classroom, lounge and seminar room. Students and faculty meet frequently in the lounge, not only for study but also for discussions, class tutorials, weekend lunches and student-led events.

18. **Collaborative Learning Community (CLC)**. CLC is a tight-knit community of freshmen, staff, and senior students who share classes, study sessions, food, and social activities in an environment that fosters learning in and out of the classroom, and is a great place for both individual study and collaboration. CLC creates an academic environment where students develop an in-depth and broader understanding of the applied sciences and how these relate to their daily life. CLC humanities subjects, seminars and social events help students better understand their role as a member of the society and their responsibilities towards fellow-beings. The salient of the program are:-

a. CLC offers classes/ recitations/tutorials in sciences and humanities both in Fall and Spring semester and a 2-credits (6 units) seminar series in Spring semester.

b. Almost all the core subjects in mathematics and sciences are offered in CLC. These subjects have the same contents and units as main stream subjects except that they are taught in smaller groups (10-15 students). Student is required to register for two subjects in sciences and mathematics offered within CLC.

c. In place of lectures and large classes, CLC provides an active learning environment with plenty of opportunities for lively discussion, question-and-answer sessions, students' presentations, and peer led problem-solving sessions.

d. CLC promotes educational innovation by encouraging faculty, staff and students to design and teach seminars and tutorials.

e. Students and staff also plan regular outings for the freshmen such as hiking trips, and visits to local museums and attractions.

f. In addition to seminar series, CLC students are required to register for minimum two subjects each in Fall and Spring semester from within the subjects offered by CLC.

g. Students may do Social Work under CLC program.

19. **Media, Arts, Science and Technology (MAST) Community**. Media, Arts, Science and Technology (MAST) Community is a home to research where students learn how research is carried out and how media, arts, science and technology is used to enhance the communication and expression. The community also gives an opportunity to pursue first-year subjects through an alternative program. Salient features of the program are:-

a. In the freshman program, instructors will **connect research topics to core applied physics and applied chemistry subjects**, and students learn first-hand how research is carried out.

b. Expose students to the intersection of media, arts and science with engineering and technology.

c. MAST courses are offered along main stream courses, in the fall and spring semesters.

d. MAST students are required to register for minimum two subjects each in fall and spring semester from within the subjects offered by MAST.

e. During fall semesters, students have the choice to take part in one of different MAST Freshman Advising Seminars, and take Fundamentals of Computational Media Design, with hands-on design exercises looking at the intersection between media, arts and technology.

f. In the spring semester they have the chance to take Introduction to Doing Research in MAST, which will include documenting and presenting research results.

g. Recitations and learning activities sessions are run during weekly community sessions/ events.

h. Visits to research centers or labs are also conducted to get knowledge about the latest research.

20. **Geo Tech Community (GTC).** Geo Tech is a learning community for NUTECH freshmen to comprehend and solve complex real-world environmental problems, and in the process get awareness, be sensitized and understand their role in protection of environment as individuals and as science, engineering, technology, management, HASS, business studies professionals. Classes are fundamentally student-driven. Students are in charge of their own educational process, from shaping the problems they want to address, to making their own decisions about procedure and timeline, right up to determining the scope and content of their final presentations. Along the way faculty, staff, and undergraduate teaching fellows provide support and resources, but all the decision-making is with the freshmen. The freshmen learn to decide how to break down a problem, shape a solution and move projects forward. Geo Tech is founded on the belief that freshmen are ready to start taking on the world's biggest problems. One year experience related to complex problem solving helps students develop leadership, management and team-working skills, and generates interest in technology and sciences. Salient features of the program are:-

a. Each year students take on a new mission related to environmental issues.

b. During the fall term, Geo Tech students enroll in subject **Solving Complex Engineering / Technology / Sciences / Humanities / Business / Arts Problems**, a subject that explores how teams of scientists, engineers and technologists approach difficult problems that require multidisciplinary approaches. At the end of term, participants defend their work before a panel of outside experts.

c. In the spring semester, students take subject **Design for Complex Environmental Issues: Building Solutions and Communicating Ideas**; small teams develop and expand aspects of the solutions proposed in the fall.

d. Field work and close interactions with engineering and technology researchers and industry professionals are an important part of the Geo Tech experience.

21. **NUTECH Personality Development Program (NPDP).** It is customized for Freshmen NUTECHIANS who focus on aspects like ethics, morality, self-discipline, rights and obligations, emotional intelligence etc. NPDP incorporates two seminars in each semester, 5-day workshops during ICAT Term, advising and mentoring. There will be an interactive session on facets of social sciences like “Being Humane” and “Modern Concept of Freedom” along with Formulation of strategy for the development of NUTECH Code of Conduct by freshmen and emotional

intelligence (EI). Further, there are also various open-ended discussion sessions on Kindness, Compassion, Empathy and Self-discipline.

22. **NUTECH Career Acceleration Program (NCAP)**. It is a unique career booster for students aimed at industry / field / society skills development, professional and ethical mentoring, and academia-industry-society networking. Program ranges from career basics - professional résumés and cover letters, networking, job-search, and interview skills - to essential workplace competencies such as communication, negotiation, presentations, problem-solving, team development and project management, and everything needed to acquire an internship. The curriculum includes workshops, seminars, 1-on-1 coaching. The curriculum also includes employers' engagement events and industrial/ institutional trips to directly connect students to internship and networking opportunities. NCAP's yearlong program offers students a rich array of workshops, employer engagement events, and seminars all designed to help students actively design their careers. The cornerstone of the NCAP curriculum is a weeklong intensive workshop during ICAT/ SCAT/ HCAT/ DCAT/ MCAT/ ECAT. In workshop, students learn how to be successful in the workplace, with coaching from successful industry and society professionals and intellectuals. Students gain experience in teamwork, communication, and decision making-key skills for success in the workplace. NCAP will be OPTIONAL for students; however, NCAP week-long workshop is MANDATORY for all sophomores. NCAP is not a credited program; however, students completing the week-long workshop successfully are awarded a Certificate of Experience. Voluntary attendance of the complete program and performance will count towards SCI.

23. **NUTECH Science / Engineering / Technology / Humanity / Arts / Societal / Management / Business Leadership Program (NSLP/ NELP/ NTLP/ NHLP/ NALP/ NSoLP/ NMLP/ NBLP)**. Formal and informal leadership development opportunities through NSLP/ NELP/ NTLP/ NHLP/ NALP/ NSoLP/ NMLP/ NBLP allow students to practice and develop critical leadership and team-working skills in the industry. NSLP/ NELP/ NTLP/ NHLP/ NALP/ NSoLP/ NMLP/ NBLP supplements NUTECH's UG education with the leadership skills that prepare students for effective careers in science, engineering, technology, humanities, arts, social sciences, management and business studies fields. NSLP, NELP, NTLP, NHLP, NALP, NSoLP, NMLP and NBLP help develop leadership skills through innovative, experiential and theoretical coursework, and practice and reflection exercises. NSLP, NELP, NTLP, NHLP, NALP, NSoLP, NMLP and NBLP are two years program; in NSLP1, NELP1, NTLP1, NHLP1, NALP1, NSoLP1, NMLP1 and NBLP1 (Year 1), there is an intense focus on teamwork and team leadership and in NSLP2, NELP2, NTLP2, NHLP2, NALP2, NSoLP2, NMLP2 and NBLP2 (Year 2), the focus extends to organizational and project contexts. Students can participate in their related program in junior and senior year. In junior year (year1) students are graded on Pass/No-Record basis for the purpose of external transcript, but letter grades are given and counted towards SCI. Participation in the related leadership program in junior year is mandatory for all UG students except those who are granted exemption by Committee on Academic Performance, while participation in senior year (year 2) will be optional. Satisfactory completion of NSLP, NELP, NTLP, NHLP, NALP, NSoLP, NMLP and NBLP is determined based on attendance, performance, active participation, motivation and commitment. Courses taken during NSLP/ NELP/ NTLP/ NHLP/ NALP/ NSoLP/ NMLP/ NBLP are in General Elective category (need to add this to other related areas as well). Students failing to complete the NSLP1, NELP1, NTLP1, NHLP1, NALP1, NSoLP1, NMLP1 and NBLP1 are not be eligible for merit-based and need-based scholarships and honors and awards. Competent authority may also approve withdrawal of any of the other University's privileges (e.g., hostel facility), when and where deemed necessary.

24. **NSLP1/ NELP1/ NTLP1/ NHLP1/ NALP1/ NSoLP1/ NMLP1/ NBLP1**. For science students in NSLP1, engineering students in NELP1, engineering technology students in NTLP1, humanities students in NHLP1, arts students in NALP1, social sciences students in NSoLP1, management studies students in NMLP1, business studies students in NBLP1, students complete two short courses in which they learn leadership frameworks and models and practice these skills through simulations and other assignments. In weekly professional/ Technical Leadership Labs,

students gain experience both being a team member and a team leader, doing hands-on activities. These experiences, combined with reflection opportunities like the Personal Leadership Development Plan and the Professional/ Industrial/ Societal Practice Requirement, enable students to improve and grow. In year 1 (junior year) workshop, students develop individual (personal) career vision, career mission and career goals. All leadership programs are partnered with respective industry, institutions and notable society members and others to offer mentors to interested leadership program students. These mentors are to be available to advise and assist students in their development as respective science, engineering, technology, HASS, management and business leaders, both in the program and on outside projects and assignments.

25. **NSLP2/ NELP2/ NTLP2/ NHLP2/ NALP2/ NSoLP2/ NMLP2/ NBLP2**. For science students in NSLP2, engineering students in NELP2, engineering technology students in NTLP2, humanities students in NHLP2, arts students in NALP2, social sciences students in NSoLP2, management studies students in NMLP2, business studies students in NBLP2, the programs take a very different role in the second year (senior year) in the Technical/ Professional Leadership Labs; some may lead a team of junior year leadership programs observing and offering feedback, while others hold positions in the student leadership organizations. The reflection experiences that began in the junior year continue, culminating with a final presentation related to capabilities of effective professional and technical leaders. Participating in mentorship is highly recommended, and specially selected mentors help prepare final year students of leadership programs 2 to transition into fruitful careers in industry organizations and society.

26. **Undergraduate Research Experience Program (UREP).** As members of technology/ system research groups, students collaborate with the faculty and graduate students on cutting-edge industry and society focused research during their junior (third) and senior (fourth) years of undergraduate studies. Students are required to do minimum 2-credits of research project under UREP. These 2-credits are counted towards fulfilling 32 credits of Industrial/ field/ societal Requirement, and are graded on Pass/ No-Record basis. Letter grades of the students are counted towards computation of SCI. Through UREP, students gain a better understanding of the intellectual process of inquiry in an engineering. technology, science, humanities, social sciences, management sciences and arts field, while having the opportunity to experience personal and professional growth. Students may earn academic credit, or work on volunteer basis. The mode which Technology/ System Research Groups students chose and all the work they do as part of UREP is worth academic credit.

27. **Options for UREP**. UREP participation options available to the students will include:

a. Academic Credit. UREP credit is general elective credit.

b. Pay from Industry/ Institution/ Organization Sponsored Project. The Technology/ System Research Groups undergraduate students may discuss funding options with their faculty supervisor. The majority of paid UREPs are anticipated to receive faculty/department funding as part of sponsored research, but if the faculty supervisor lacks the funds to offer the undergraduate students a paid UREP position; they may request funds from the university for UREP.

c. Volunteering. It is a practical option that requires equal time commitment of highly motivated volunteers. Those who opt can become a source of inspiration for the other UREP Technology/ System Research Groups and their members especially for the first-time researchers.

28. All UREP projects must be worthy of academic credit, regardless of whether the student chooses to participate for credit, pay or as a volunteer. The decision to receive pay, credit, or volunteer is something a student Technology/ System Research Groups should decide in consultation with their faculty supervisor. However, some options may be restricted for certain types of UREPs. Technology/ System Research Groups based UREP projects take place during the academic year and or over the summer and are conducted across the University in academic departments as well as interdisciplinary technology/ system laboratories and centers. Projects can last an entire semester or continue for a year or more. The projects may take place on-campus and off-campus as industry / national scientific labs / organization / institutions projects. Since UREP is an academic program, its application must be completed well in time for timely evaluation of the content and scope of planned technology based industry / organization / institution specific research. During any given term or summer, the students may not receive the credit for the same UREP project. If UREP research becomes final year project thesis work, students will not earn UREP credit for their thesis research during the semester(s) in which they are registered for thesis credit. Any questions regarding thesis credit policies should be directed to the academic department awarding the credit. If students participate in voluntary UREP, they are eligible to receive transcript recognition. The notation is added to their transcript at the end of the semester provided that their faculty Technology/ System Research Groups supervisor deems the semester's work satisfactory.

29. **UREP Expectations and Responsibilities**. Extensive efforts are required from all Technology/ System Research Groups to make UREP a rewarding educational endeavor. Participants should conduct themselves with the same integrity and high standards of conduct expected of all members of the NUTECH community. The University is extraordinarily diverse, and the ability to work with others is important. In all cases of Technology/ System Research Groups, an approved UREP project presumes active and regular communication and oversight between participating undergraduates and their NUTECH faculty Technology/ System Research Groups supervisors. Non-approved work at a corporation or other societal / commercial entity, even under the supervision of a NUTECH faculty member and even if at a start-up, is not eligible for the UREP program.

30. **Industrial / Field / Organizational Learning Experience Program (ILEP/ FLEP/ OLEP)**. The Industrial Learning Experience Program (ILEP) for national sciences, engineering and engineering technology students, Field Learning Experience Program (FLEP) for humanities, arts, social sciences students and Organizational Learning Experience Program (OLEP) for management and business studies students give students an opportunity to theory being taught in class being put to use in the industry/ field/ organization. During most of regular semesters, students are given industrial/ field/ organizational class in the related industry/ field/ organization. The on-campus portion of this program includes outside preparation focused on studying similar industrial/ field/ organizational processes/ practices being used/ followed in international industry/ institutions/ societies/ organization, preparation of a report and discussion and presentation during a tri-weekly seminar session. In addition, under this program student are exposed to different ways of thinking and solving industrial/ field/ organizational problems as they develop professional technical knowledge and allied skills. Students have to apply classroom knowledge towards solving real-world industrial/ field/ organizational problems through unique opportunities. Students are encouraged and facilitated to do industry / field/ organizational internship in every summer. However, it is mandatory for all students to take part in a supervised and structured eight week industrial / field/ organizational internship program in the summer of their junior year. Successful completion of eight weeks industrial/ field/ organizational internship is required. This internship is arranged by the university, which has to be structured and supervised. During this internship:-

a. Through assigned and duly graded industrial/field/organizational projects, students have to apply classroom knowledge and creative abilities to solve real-world industrial /field/organizational problems.

b. Students are required to understand and value industrial/ organizational/ field/ institutional/ societal culture and its differences with the academic environment and how to communicate within and adapt to industrial culture.

31. Internship is graded on Pass/ No-Record basis, however, letter grades are counted towards computation of Student Competence Index (SCI). ILEP/FLEP/OLEP aims to prepare students to work efficiently and effectively in the industry /field/organization soon after graduation; and are ready to work for industry/institution/organizations in areas of system design and creation/development of related technologies/business/skills as part of multi-disciplinary teams/groups. The program is designed to help students comprehend industrial processes and understand the industrial/institutional/organizational/field/societal demands, needs and working culture. Students have to apply classroom knowledge towards solving real-world industrial/organizational/institutional/field/societal problems through unique opportunities. Below are the components of ILEP/FLEP/OLEP:

Sr. No	Category	Total Credit Hour
a.	Industrial/Field/Organizational Learning Experience (ILE/FLE/OLE) during first 6 semesters	6
b.	Research Project in 3rd & 4th Year	2
c.	ICAT/ SCAT/HCAT/DCAT/MCAT/ECAT	6
d.	8-week supervised and structured internship in summer of 3rd Year	8

32. **Industrial and Creative Activities Term (ICAT), Society and Creative Activities Term (SCAT), Humanity and Creative Activities Term (HCAT), Developmental and Creative Activities Term (DCAT), Management and Creative Activities Term (MCAT and Entrepreneurship and Creative Activities Term (ECAT)**. ICAT/ SCAT/ HCAT/ DCAT/ MCAT/ ECAT are a four-week period after the fall semester during which faculty and students are free from the rigors of regularly scheduled classes; and will get engaged in industry-focused design/development projects and technology driven innovative/creative activities. Students and faculty are also free to set their own personal teaching and learning goals based on personal

interests. Academic units and Technology System Research Groups can offer both credited and non-credited activities, but, non-academic units/set-ups can only offer non-credited activities. Individual students and support staff can also offer non-credited activities to exhibit their personal talent. Students and support staff find organizing ICAT/ SCAT/ HCAT/ DCAT/ MCAT/ ECAT activities a rewarding experience. For many, it is their first opportunity to develop and teach a course/program based on their own ideas. In doing so, they acquire organizational abilities and leadership skills that prove invaluable for their careers. All ICAT activities for undergraduate students are to be approved by Committee on Curricula and Dean Undergraduate Education.

33. **Tuition, Room and Board**. Regular students paying full tuition in either the fall or spring term do not have to pay additional tuition fees to the University during ICAT/ SCAT/ HCAT/ DCAT/ MCAT/ ECAT. Students who have not been charged full tuition in either the fall or spring term are subject to additional tuition charges and should consult the Registrar's Office.

Credits and Grades. Each undergraduate student must take minimum two credits of technology/industry/field/organization focused creative industrial/field/organization/societal projects during any of the four ICAT/ SCAT/ HCAT/ DCAT/ MCAT/ ECAT. A student can take at most three credits during ICAT/ SCAT/ HCAT/ DCAT/ MCAT/ ECAT. Subjects/ projects taken during any one ICAT/ SCAT/ HCAT/ DCAT/ MCAT/ ECAT are graded on Pass/ No Record basis – only subject passed by the students are reflected on the transcript in General Elective category with grade shown as “Passed”. To recognize the better efforts, letter grades are also given and counted towards the computation of SGA score.