SCHEME OF EXAMINATION

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SYLLABI

for

Bachelor of Technology Programmes of Studies under the aegis of University School of Information Communication and Technology offered at Affiliated Institutions of the University

(1st Year Common Scheme and Syllabus, and 2nd year onwards framework)

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Approval History:

1. 1st year scheme and syllabus (1st to 2nd semester) and Framework for higher semesters (3rd to 8th semesters or 2nd to 4th year) implemented from 2025-26 batch approved by Board of Studies of USICT on 28/07/25.

2. 1st year scheme and syllabus (1st to 2nd semester) and Framework for higher semesters (3rd to 8th semesters or 2nd to 4th year) implemented from 2025-26 batch approved by Academic Council Sub-committee on 01/08/2025.

Programme Outcomes

1. **Engineering Knowledge** (**PO01**): Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem Analysis** (**PO02**): Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

3. **Design/Development of Solutions** (**PO03**): Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct Investigations of Complex Problems** (**PO04**): Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions for complex problems:

    a. that cannot be solved by straightforward application of knowledge, theories and techniques applicable to the engineering discipline as against problems given at the end of chapters in a typical text book that can be solved using simple engineering theories and techniques;

    b. that may not have a unique solution. For example, a design problem can be solved in many ways and lead to multiple possible solutions;

    c. that require consideration of appropriate constraints / requirements not explicitly given in the problem statement such as cost, power requirement, durability, product life, etc.;

    d. which need to be defined (modelled) within appropriate mathematical framework; and

    e. that often require use of modern computational concepts and tools, for example, in the design of an antenna or a DSP filter.

5. **Modern Tool Usage** (**PO05**): Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

6. **The Engineer and Society** (**PO06**): Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and Sustainability** (**PO07**): Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics** (**PO08**): Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and Team Work** (**PO09**): Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication** (**PO10**): Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project Management and Finance** (**PO11**): Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long Learning** (**PO12**): Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

Acronyms for Core Disciplines:

CSE	:	Computer Science and Engineering
CS	:	Computer Science
IT	:	Information Technology
CST	:	Computer Science and Technology
ITE	:	Information Technology and Engineering
ECE	:	Electronics and Communications Engineering
EE	:	Electrical Engineering
EEE	:	Electrical and Electronics Engineering
ICE	:	Instrumentation and Control Engineering
ME	:	Mechanical Engineering
CE	:	Civil Engineering

Acronyms for Emerging Area Disciplines:

MAE	:	Mechanical and Automation Engineering
CSE-AI	:	Computer Science and Engineering (Artificial Intelligence)
CSE-AIML	:	Computer Science and Engineering (Artificial Intelligence and Machine Learning)
CSE-DS	:	Computer Science and Engineering (Data Science)
CSE-IoT	:	Computer Science and Engineering (Internet of Things)
CSE-ICB	:	Computer Science and Engineering (Internet of Things and Cyber Security including Block Chain Technology)
CSE-Net	:	Computer Science and Engineering (Networks)
CSE-CS	:	Computer Science and Engineering (Cyber Security)

Acronyms for Minor Specializations*(Applicable only for Core Disciplines)*:

AI	:	Artificial Intelligence
AIML	:	Artificial Intelligence and Machine Learning
DS	:	Data Science
BT	:	Block Chain Technology
IoT	:	Internet of Things
ICB	:	Internet of Things and Cyber Security including Block Chain Technology
Net	:	Networks
CS	:	Cyber Security
MLDA	:	Machine Learning and Data Analytics
SC	:	Soft Computing
SE	:	Software Engineering
FSD	:	Full Stack Development
IPCV	:	Image Processing and Computer Vision
RA	:	Robotics and Automation
ES	:	Embedded Systems
VLSI	:	VLSI Design
WMC	:	Wireless and Mobile Communications
EV	:	Electrical Vehicles
MT	:	Microgrid Technologies
PS	:	Power Systems
PED	:	Power Electronics and Drives
CI	:	Control and Instrumentation
CADM	:	Computer Aided Design and Manufacturing
DMS	:	Design and Measurement Systems
DT	:	Design Trends
TES	:	Thermal Energy Sources
QM	:	Quality Management
CTM	:	Construction Technology and Management
IE	:	Infrastructure Engineering

GTSE	:	Green Technology and Sustainability Engineering
CSE	:	Computer Science and Engineering
ECE	:	Electronics and Communications Engineering
EE	:	Electrical Engineering
SD	:	Software Development
ME	:	Mechanical Engineering
ICE	:	Instrumentation and Control Engineering
CE	:	Civil Engineering
UHV	:	Universal Human Values

Acronyms for Course / Paper Groups and Codes:

BS	:	Basic Science
HS	:	Humanities, Social Science
MS	:	Management Studies
ES	:	Engineering Science
MC	:	Mandatory Courses
PC	:	Programme Core, that is course / paper offered in the discipline of the programme as a compulsory paper.
PCE	:	Programme Core Elective, that is elective course / paper offered in the discipline of the programme.
EAE/OAE	:	Emerging Area Elective / OpenArea Elective offered in the institution
CIC	:	Computer Science / IT Core
CIE	:	Computer Science / IT Elective
ECC	:	Electronics Core
ECE	:	Electronics Elective
EEC	:	Electrical Core
EEE	:	Electrical Elective
ICC	:	Instrumentation Core
ICE	:	Instrumentation Elective
MEC	:	Mechanical Core
MEE	:	Mechanical Elective
CEC	:	Civil Core
CEE	:	Civil Elective
MAC	:	Automation Core
MAO	:	Automation Open Elective

Definitions:

Batch: The batch of the student shall mean the year of the first time enrolment of the students in the programme of study in the first semester. Lateral entry students admitted in the 3rd semester / 2nd year shall be designated as students admitted in the previous batch as they are admitted one year later. A student re-admitted in a programme of study in a lower / later batch shall be considered as the student of the original batch for the purpose calculation of duration of study (lateral entry o readmission due to academic break).

Programme of study shall mean Bachelor of Technology.

Major / Primary specialization / discipline shall mean the discipline in which the student is admitted / upgraded or transferred.

Minor specialization shall mean the specializations earned through the EAE or OAE route subject to fulfilment of requirements specified in the scheme of study for the concerned minor specialization.

Paper / Course shall be treated as synonyms. A paper is one unit of curriculum taught, in general, in one particular semester.

The document is prepared after extensive discussion among the stakeholders. The following has been guiding principles for the design of this document:

1. AICTE Handbook 2024-25 applicable till 2026-27

2. The eligibility conditions for the admissions to these programmes. The eligibility conditions for these programmes of studies do not require chemistry to be studied at the 10+2 level.
3. The multiple entry and multiple exit principle of NEP requires a major overhaul of the structure of the scheme and syllabi. This requires that a minimum knowledge of the specific discipline be taught in the first year itself so that a Certificate may be awarded.
4. Minor specializations shall be offered. This allows the students to study not only the core foundational papers / subjects in the discipline but also subjects in the focus areas and emerging areas of technology that are relevant to the discipline and of related disciplines.
5. Subject of Graduate Aptitude Test in Engineering (GATE), for these disciplines shall be studied by the students, as core subjects.
6. Multiple Exit and re-entry after completion of every academic year of study.
7. Value Added Course on “Environment Studies” of 2 credits.
8. Value Added Course on “Human Values and Ethics”
9. Value Added Course on “Science and Practice of Happiness”
10. The Value Added Courses shall total for 6 credits
11. Inter-disciplinary Courses of 9 Credits to be studied by students from other discipline than their own.
12. Maximum Credits: 176
13. Minimum Credits 160
14. Every year of teaching shall be of approximately 40 to 48 credits

Note:

A. The document currently specifies the following:
    1. The scheme framework for the 4 year Bachelor of Technology part of the Dual Degree programme.
    2. The scheme and syllabus of the first two years.
    3. The regulation for exit and re-entry into the programme after completion of one academic year.
    4. The regulation for the award of the degree.
B. The document only provides for the framework for the following (the detailed and finalization of these shall occur in subsequent meeting of the Board of Studies of the School):
    1. The final scheme and syllabus of the third and fourth year of study.
    2. The minor specializations that may be offered to the students.

Other Acronyms:

PCC	:	Programme Coordination Committee
APC	:	Academic Programme Committee comprising of all faculty of the department / institutions and as defined in the implementation rules and the Ordinance 11 of the University.
L	:	Number of Lecture hours per week
T/P	:	Number of Tutorial / Practical Hours per week
C	:	Number of credits assigned to a course / paper
COE	:	Controller of Examinations of the Examinations Division of the University.
SGPA/CGPA	:	Semester/Cumulative Grade Point Average.
NUES	:	Non University Examination System - No term end examination shall be held. The evaluation shall be conducted as per the scheme of examinations as described in the scheme of study.

FIRST YEAR

Common Scheme and Syllabus for All

Bachelor of Technology Programmes of Study under the aegis of University School of Information Communication and Technology offered at Affiliated Institutions of the University

First Semester						
Group	**Code**	**Paper**	**L**	**P**	**Credits**	**Mode**
ES BS	ES-101 BS-103	*Any one of the following: Programming in 'C' Applied Chemistry	3	-	3	Theory
BS	BS-105	Applied Physics – I	3	-	3	Theory
ES BS	ES-107 BS-109	*Any one of the following: Electrical Science Environmental Studies	3	-	3	Theory
BS	BS-111	Applied Mathematics – I	3	-	3	Theory
HS HS	HS-113 HS-115	**Group 1 or Group 2 shall be offered: Group 1: Communications Skills OR Group 2: Human Values and Ethics***	3 2	-	3 2	Theory
ES	ES-119	Manufacturing Process	3	-	3	Theory
BS	BS-151	Applied Physics-I Lab	-	2	1	Practical
ES BS	ES-153 BS-155	Any of the following corresponding to the theory paper offered: Programming in 'C' Lab Applied Chemistry Lab	- -	2	1	Practical
ES	ES-157	Engineering Graphics-I	-	2	1	Practical
ES BS	ES-159 BS-161	Any of the following corresponding to the theory paper offered: Electrical Science Lab Environmental Studies Lab	- -	2	1	Practical
Total			17/18	8	21/22	

*For a particular batch of a programme of study one out of these two papers shall be taught in the first semester while the other shall be taught in the 2nd semester. Students who have to re-appear can only reappear in the odd semester if originally offered to the student in the 1st semester and similarly for the students who study the paper in the second semester. The institution shall decide which paper to offer in which semester.

**For a particular batch of a programme of study either the paper on "Communications Skills" (Group 1), or Group 2: papers ("Human values and ethics") shall be taught in the first semester while the other group shall be taught in the 2nd semester. Students who have to re-appear can only reappear in the odd semester if originally offered to the student in the 1st semester and similarly for the students who study the paper(s) in the second semester. The institution shall decide which paper group to offer in which semester.

***__NUES:__** All examinations to be conducted by the concerned teacher as specified in the detailed syllabus of the paper.

Group	Code	Paper	L	P	Credits
HS/MS	HS-352	NSS / NCC / Cultural Clubs / Technical Society / Technical Club#			2

#NUES: Comprehensive evaluation of the students by the concerned coordinator of NCC / NSS / Cultural Clubs / Technical Society / Technical Clubs, out of 100 as per the evaluation schemes worked out by these activity societies, organizations; the co-ordinators shall be responsible for the evaluation of the same. These activities shall start from the 1st semester and the evaluation shall be conducted at the end of the 6th semester for students admitted in the first semester. Students admitted in the 2nd year (3rd semester) as lateral entry shall be for the period of 3rd semester to 6th semester only

Second Semester						
Group	**Paper Code**	**Paper**	**L**	**P**	**Credits**	**Mode**
ES BS	ES-102 BS-104	*Any one of the following: Programming in 'C' Applied Chemistry	3	-	3	Theory Theory
BS	BS-106	Applied Physics – II	3	-	3	Theory
ES BS	ES-108 BS-110	*Any one of the following: Electrical Science Environmental Studies	3	-	3	Theory Theory
BS	BS-112	Applied Mathematics – II	3	-	3	Theory
HS HS	HS-114 HS-116	**Group 1 or Group 2 shall be offered: Group 1: Communications Skills OR Group 2:	3 2	-	3 2	Theory
ES	ES-114	Engineering Mechanics	3	-	3	Theory
BS	BS-152	Physics-II Lab	-	2	1	Practical
ES BS	ES-154 BS-156	*Any of the following corresponding to the theory paper offered: Programming in 'C' Lab Applied Chemistry	- -	2	1	Practical Practical
ES	ES-158	Engineering Graphics-II	-	2	1	Practical
ES BS	ES-160 BS-162	*Any of the following corresponding to the theory paper offered: Electrical Science Lab Environmental Studies Lab	- -	2	1	Practical
ES	ES-164	Workshop Technology		2	1	Practical
Total			17/18	10	22/23	

*For a particular batch of a programme of study one out of these two papers shall be taught in the first semester while the other shall be taught in the 2nd semester. Students who have to re-appear can only reappear in the odd semester if originally offered to the student in the 1st semester and similarly for the students who study the paper in the second semester. The institution shall decide which paper to offer in which semester.

**For a particular batch of a programme of study either the paper on "Communications Skills" (Group 1), or Group 2: papers ("Human values and ethics") shall be taught in the first semester while the other group shall be taught in the 2nd semester. Students who have to re-appear can only reappear in the odd semester if originally offered to the student in the 1st semester and similarly for the students who study the paper(s) in the second semester. The institution shall decide which paper group to offer in which semester.

***NUES:** All examinations to be conducted by the concerned teacher as specified in the detailed syllabus of the paper.