UMT

University of Management and Technology
Estd. 1990

RANKED #1

THE World University Rankings 2023

PRIVATE SECTOR UNIVERSITY IN PAKISTAN

Get Ahead
Faster
with Industry
Specific **Minor**

Pakistan's Premier General Research University

GREAT PLACE - GREAT LEARNING - GREAT FUTURE

Eligibility Criteria for Opting Minors

The Minor courses can be registered by the students of Undergraduate programs

A student may register for Minor after successful completion of 3 semesters

The minimum CGPA required for opting a Minor is 2.60 CGPA for Undergraduate Programs

Why Get A Minor Specialization?

Career Flexibility

Better Employability Options

Interdisciplinary Understanding

Acquisition of Diverse Skills and Knowledge

Readiness for the Dynamic Job Market

Personal Growth and Development

Key Points:

- A special provision has been created in ERP for all students having CGPA 2.60 & above can register up to 21 credit hours opting for minors
- Minor courses with their titles will be reflected on the student's transcript
- Minor courses CGPA will have no effect on SGPA/ CGPA
- Credit hours for minor courses will be in addition to the standard requirement of degree
- "W" and "F" grades in case of a Minor subject will not be reflected on the student's transcript
- The student has to complete a minimum of 12 CHs (4 courses) to earn a Minor
- In case the student does not clear the minimum required courses for minors, then the remaining courses with pass grades will be reflected in the transcript as 'Additional Courses"
- The tuition fee of each minor course is Rs 7500/- per semester only.
- Recognition (sash, certificates, medals etc.) for the students who complete requirements of Minor Courses in Rector Merit Ceremonies irrespective of their CGPA
- Once a student has selected a stream of minors, they will have to pursue that specific stream.

School of Science (SSC)

Chemistry

List of Minor Courses

	Course Code	Credit Hours
Principles of Chemistry	CH100	3
Environmental Chemistry	CH205	3
Applied Chemistry	CH208	3
Chemistry in Every day Life	CH210	3
Industrial Chemistry-I	CH311	3
Industrial Chemistry-II	CH315	3
Spectroscopy-Theory & Applications	CH417	3
Separation Techniques	CH419	3
Environmental Analytical Chemistry	CH428	3
Fundamentals of Computational Chemistry	CH435	3
Industrial Safety and Health	CH440	3

Mathematics

List of Minor Courses

	Course Code	Credit Hours
Calculus with Applications	MA100	3
Extensions of Set Theory	MA104	3
Ordinary Differential Equations	MA218	3
Computational Physics & Numerical Analysis	MA223	3
Group Theory	MA308	3
Real Analysis	MA312	3
Partial Differential Equations	MA321	3
Complex Analysis	MA324	3
Vector and Tensor Analysis	MA330	3
Mathematics Modeling	MA402	3
Introduction to Graph Theory	MA403	3
Fluid Mechanics	MA407	3

Physics

List of Minor Courses
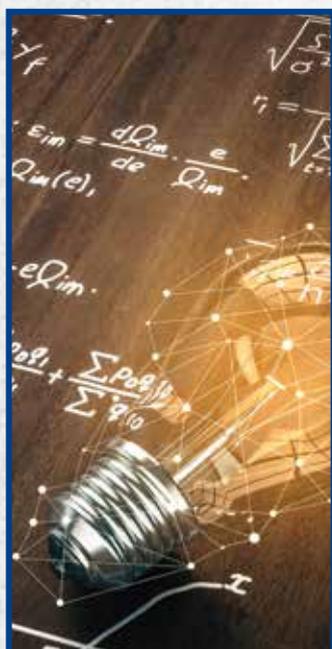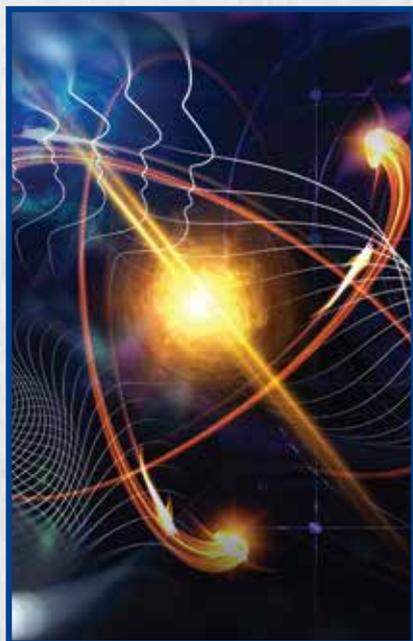
	Course Code	Credit Hours
Mechanics	PH101	3
Electricity and Magnetism	PH102	3
Waves and Oscillations	PH103	3
Modern Physics	PH204	3
Heat and Thermodynamics	PH205	3
Optics	PH206	3
Mathematical Methods of Physics	PH307	3
Quantum Mechanics	PH308	3
Electronics	PH316	3
Nuclear Physics	PH417	3
Solid State Physics	PH421	3

Life Sciences (Biotechnology)

List of Minor Courses
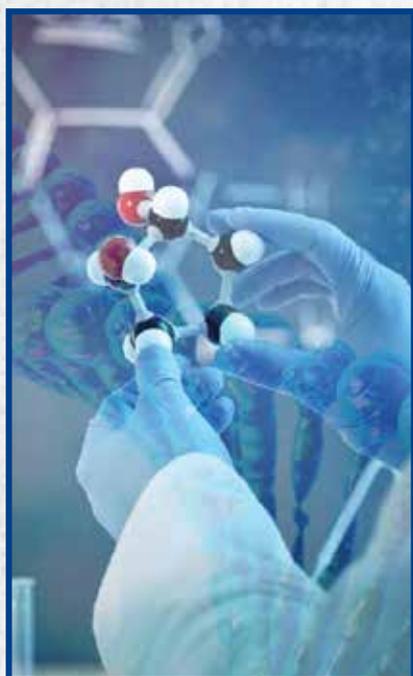
	Course Code	Credit Hours
Cell Biology	BT101	3
Genetics	BT201	3
General Virology	MB202	3
Fundamentals of Microbiology	MB203	3
Industrial Microbiology	MB302	3
Clinical Bacteriology and Virology	MB311	3
Food Microbiology	MB401	3
Epidemiology and Public Health	MB402	3

Life Sciences (Biochemistry)

List of Minor Courses

	Course Code	Credit Hours
■ Industrial Biochemistry	BC404	3
■ Clinical Biochemistry	BC314	3
■ Nutritional Biochemistry	BC402	3
■ Metabolism and Bioenergetics	BC313	3
■ Cell Biology	BT101	3
■ Amino Acids, Proteins and Nucleic Acids	BC211	3
■ Carbohydrates and Lipids	BC202	3
■ Analytical Techniques in Biochemistry	BC311	3

Life Sciences (Microbiology)

List of Minor Courses

	Course Code	Credit Hours
■ Cell Biology	BT101	3
■ Genetics	BT201	3
■ General Virology	MB202	3
■ Fundamentals of Microbiology	MB203	3
■ Industrial Microbiology	MB302	3
■ Clinical Bacteriology and Virology	MB311	3
■ Food Microbiology	MB401	3
■ Epidemiology and Public Health	MB402	3

Dr Hasan Murad
School of Management (HSM)

Accounting and Finance

List of Minor Courses

	Course Code	Credit Hours
Financial Accounting	ACT130	3
Accountant in Business	MG221	3
Cost Accounting	AC230	3
Business Finance	FN340	3
Introduction to Islamic Banking and Finance	IB380	3
Financial Management	FN440	3

Economics

List of Minor Courses

	Course Code	Credit Hours
Principles of Microeconomics	EC111	3
Principles of Macroeconomics	EC121	3
Issues in Pakistan's Economy	EC270	3
Islamic Economics	EC345	3
Theory of Development Economics	EC355	3
Managerial Economics	EC360	3

Information Systems

List of Minor Courses

	Course Code	Credit Hours
Database Management Systems	IS250	3
Datawarehousing and Data Mining	IS351	3
Introduction to Data Science	IS371	3
Business Analytics	IS391	3
IT Project Management	IS412	3
Enterprise Resource Planning	IS495	3

Human Resource Management

List of Minor Courses

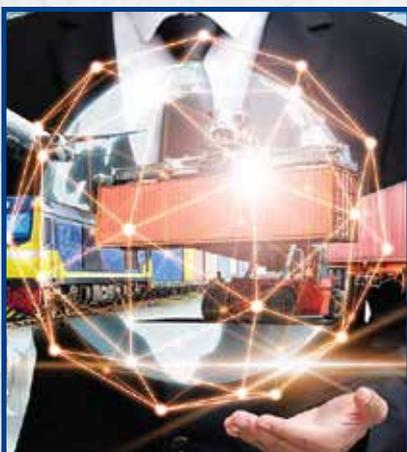|	Course Code	Credit Hours
Organizational Behavior	MG330	3
Managing Development in Organization	MG465	3
Managing Knowledge in Organization	MG470	3
Managing Alliance and Partnership	MG475	3
International Business	MG490	3

Marketing

List of Minor Courses

	Course Code	Credit Hours
Principles of Marketing	MK210	3
Retail Marketing	MK401	3
Consumer Behaviour	MK450	3
Selling Skills	MK470	3
Digital Marketing	MK477	3

Operations and Supply Chain

List of Minor Courses

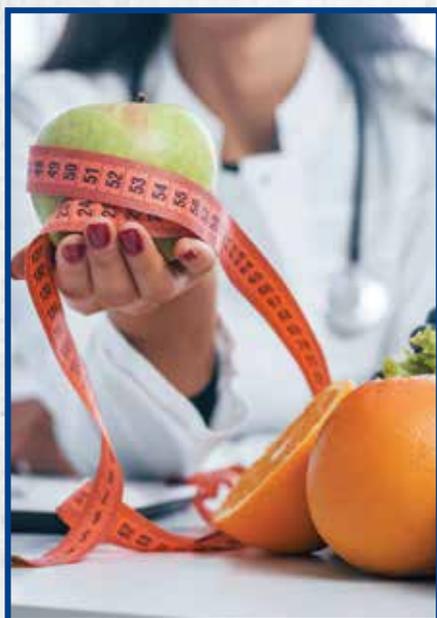|	Course Code	Credit Hours
Production Operations Management	OM345	3
Total Quality Management	OM460	3
Project Management	OM470	3
Supply Chain Performance	SM473	3
Supply Chain Design	SM476	3

School of Food and Agricultural Sciences (SFAS)

Food Science and Technology

List of Minor Courses

	Course Code	Credit Hours
Introduction to Food Science and Technology	FST101	3(2-1)
Food Safety and Hygiene	FST102	3(3-0)
Basic Agriculture	FST104	3(3-0)
Food Processing and Preservation	FST105	3(2-1)
Introduction to Food Supply Chain	FQM202	3(3-0)
Food Chemistry	FST206	3(3-0)
Food Quality Management	FST301	3(3-0)

Human Nutrition and Dietetics

List of Minor Courses

	Course Code	Credit Hours
Fundamentals of Human Nutrition	HND101	3(3-0)
Macronutrients in Human Nutrition	HND102	3(3-0)
Micronutrients in Human Nutrition	HND203	3(3-0)
Community Nutrition and Public Health	HND211	3(2-1)
Functional Foods and Nutraceuticals	HND305	3(3-0)
Global Hunger and Food Security	HND306	3(3-0)

School of Professional Psychology (SPP)

Psychology

List of Minor Courses

	Course Code	Credit Hours
■ Brain, Bio chemistry & Behavior	CP203	3
■ Personality Theories	PSY206	3
■ Perspective Psychology	PSY209	3
■ Developmental Psychology	PSY306	3
■ Gender Psychology	PSY310	3
■ Cognative Psyhology	PSY315	3
■ Social Psychology	CP403	3
■ Cross-Cultural Psychology	PSY496	3

School of Social Sciences & Humanities (SSSH)

Sociology

List of Minor Courses

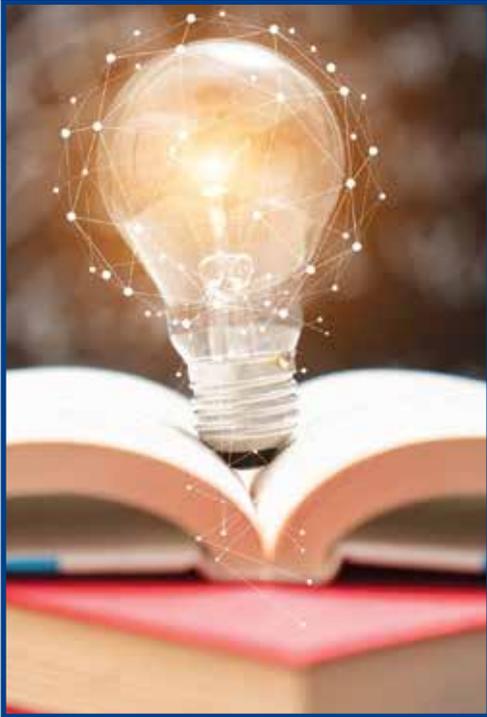|	Course Code	Credit Hours
■ Sociological Theories (Contemporary)	SOC101	3
■ Cultural Anthropology	SOC302	3
■ NGO Management	SOC305	3
■ Sociological Research Methods	SOC308	3
■ Population Studies and Social Demographics	SOC333	3
■ Sociology of Human Rights	SOC336	3
■ Sociology of Health and Illness	SOC411	3
■ Criminology	SOC440	3

International Relations

List of Minor Courses

	Course Code	Credit Hours
■ Introduction to Strategic Studies	IR130	3
■ International Relations Theory	IR200	3
■ International Political Economy	IR240	3
■ Peace and Conflict Studies	IR330	3

Education

	Course Code	Credit Hours
Foundations of Education	ED214	3
Inclusive Education	ED119	3
Education for Sustainable Development	ED318	3
Educational Psychology	ED344	3
Curriculum Development	ED210	3
Critical Thinking and Reflective Practices	ED116	3
Educational Assessment and Evaluation	ED217	3
School Management	ED356	3
Educational Policies and Plans of Pakistan	ED221	3
Contemporary Literacies	ED220	3
Teaching Profession	ED218	3
Teaching of Science	ED443	3
Teaching of Urdu	ED321	3
Teaching of social studies and Islamiyat	ED357	3
Teaching English	ED410	3
Teaching of art craft and calligraphy	ED107	3
Teaching of Mathematics	ED446	3
Classroom Management	ED 309	3

Special Needs Education

	Course Code	Credit Hours
Production of resource material in multimedia	SNE 366	4
Differentiated Teaching in regular classroom	SNE 424	3
Autism spectrum disorder	SNE 455	3
Specific learning disabilities	SNE 440	3
Teaching speech and auditory skills	SNE 445	3
Education of children with visual impairment	SNE 435	3
Neurological disorders and management	SNE 448	3

Institute of Aviation Studies (IAS)

Aviation Professional Pilot

List of Minor Courses

	Course Code	Credit Hours
Introduction to Aviation	AS101	3
Principles of Flights	PT101	3
Air Law	PT122	3
Radio Telephony	PT123	3
Aviation English	AS220	3
Aircraft General Knowledge	PT223	3
Meteorology	PT231	3
Practical Flight Training-I	PT312	3
Practical Flight Training-II	PT313	3

Aviation Management

List of Minor Courses
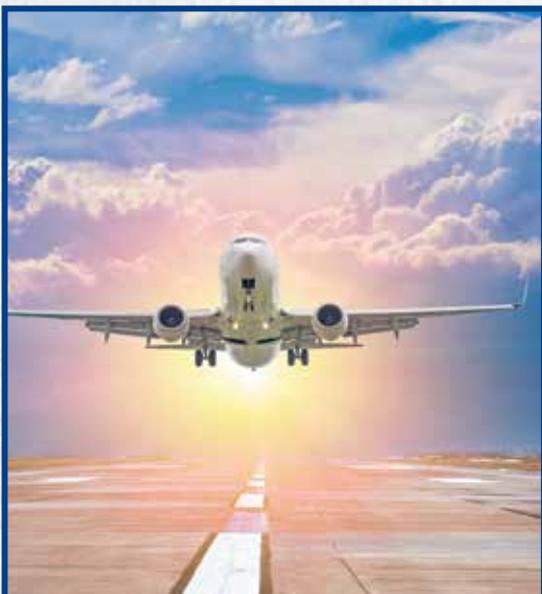
	Course Code	Credit Hours
Introduction to Aviation	AS101	3
Meteorology and Flight Theory	AM115	3
Airport Operations and Passenger Handling	AM125	3
Aviation Law	AM161	3
Airspace and Air Traffic Management	AM201	3
A/C Performance and Simulations	AM212	2-1
Aviation English	AS220	3
Aviation Safety Management	AM221	3
Aviation Security	AM441	3
Environmental Factors in Aviation	AM417	3
Human Factors in Aviation	AM336	3

School of Liberal Arts (SLA)

Communication and Creative Skills
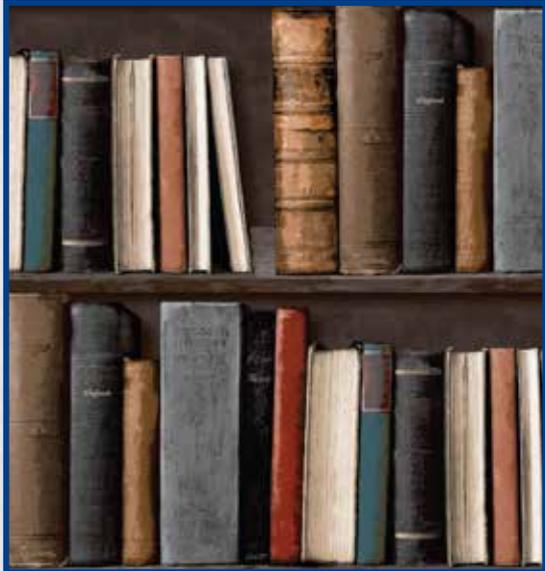
Digital and Professional Communication

	Course Code	Credit Hours
■ Computer-Assisted Language Learning	LL305	3
■ Language, Media & Power	LL310	3
■ Presentation Skills	EN301	3
■ Phonetics and Phonology	LL213	3

Creative Expression and Digital Cultural Studies

	Course Code	Credit Hours
■ Introduction to Creative Writing (Non-Fiction)	LR308	3
■ Social and Cultural History of the Subcontinent	LR329	3
■ Digital Humanities	LR400	3
■ Comparative Religion	LR419	3
■ Research and Academic Writing	LR228	3

School of Systems and Technology (SST)
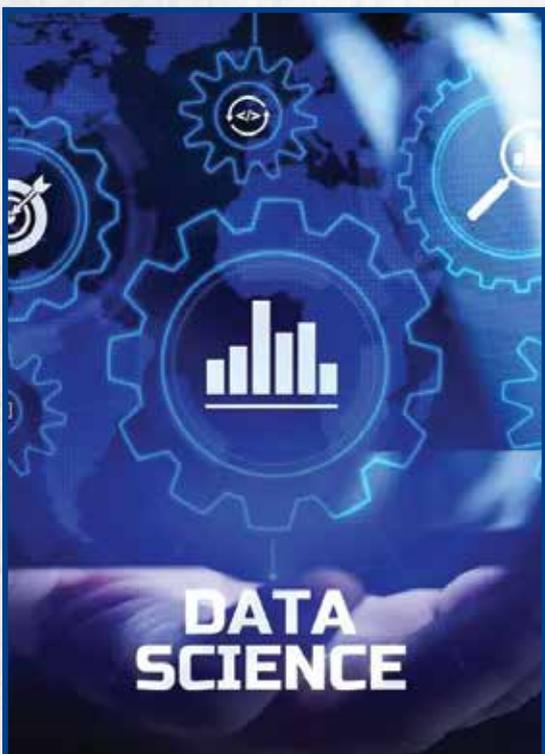
Data Science (SST Students)

Core: Core courses must be passed before taking any elective. Every SST student enrolled in Minor must pass the following two (2) core courses:

	Course Code	Credit Hours
■ Advanced Statistics	DS3052	3
■ Introduction to Data Science (pre-req DS3052)	DS2136	3

Electives: Must pass any two (2) courses from the following list of electives but cannot take both Machine Learning and Deep Learning:

	Course Code	Credit Hours
■ Big Data Analytics	DS3136	3
■ Data Warehousing and Business Intelligence	DS3137	3
■ Data Visualization	DS3139	3
■ Deep Learning	CS4152	3
■ Cloud Computing	CS439	3
■ Machine Learning	CS446	3
■ Data Mining	CS458	3

Data Science (Non-SST Students)

Eligibility Criteria: Student has studied the following course or its equivalent in their undergraduate or they have to enroll in the following course in order to be eligible to enroll in this Minor along with core courses.

	Course Code	Credit Hours
Probability & Statistics	MA150	3

Core: Core courses must be passed before taking any elective. Every student enrolled in this minor must pass the following two (2) core courses:

	Course Code	Credit Hours
Programming Fundamentals	CC1021	3+1
Introduction to Data Science (pre-req CC1021)	DS2136	3

Electives: Must pass any two (2) courses from the following list of electives but cannot take both Machine Learning and Deep Learning:

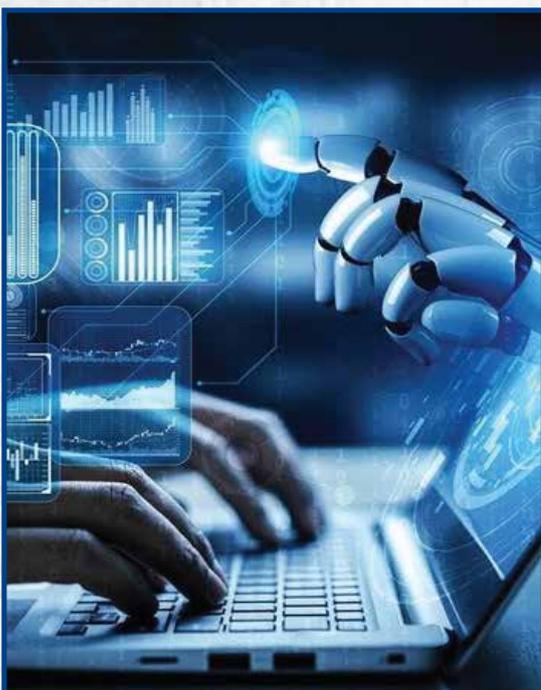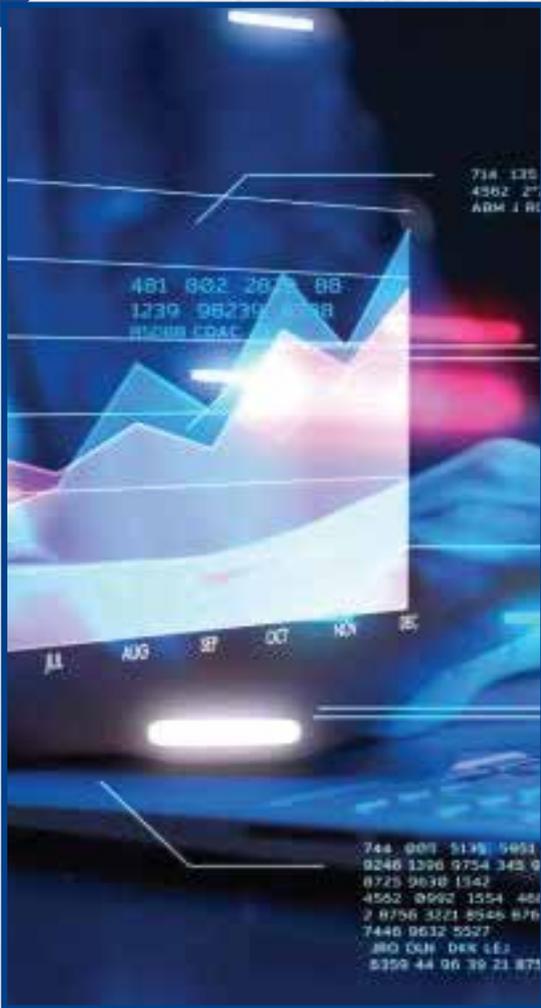|	Course Code	Credit Hours
Data Mining	CS458	3
Machine Learning	CS446	3
Big Data Analytics	DS3136	3
Data Visualization	DS3139	3
Data Warehousing and Business Intelligence	CS474	3
Deep Learning	CS4152	3

Computer Science

Core: Core courses must be passed before taking any elective. Every student enrolled in this minor must pass the following three (3) core courses:

	Course Code	Credit Hours
Programming Fundamentals	CC1021	3+1
Object Oriented Programming (pre-req CC1021)	CC1022	3+1
Data Structures & Algorithms (pre-req CC1022)	CC2042	3+1

Electives: Must pass any one (1) course from the following list of electives:

	Course Code	Credit Hours
Database Systems	CC230	3+1
Computer Networks	CC251	2+1
Operating Systems	CC323	3
Analysis of Algorithms	CC342	3

Software Application Development (Non-SST Students)

Core: Core courses must be passed before taking any elective. Every student enrolled in this minor must pass the following three (3) core courses:

	Course Code	Credit Hours
■ Programming Fundamentals	CC1021	3+1
■ Object Oriented Programming (pre-req CC1021)	CC1022	3+1
■ Database Systems (pre-req CC1022)	CC2141	3+1

Electives: Must pass any one (1) course from the following list of electives:

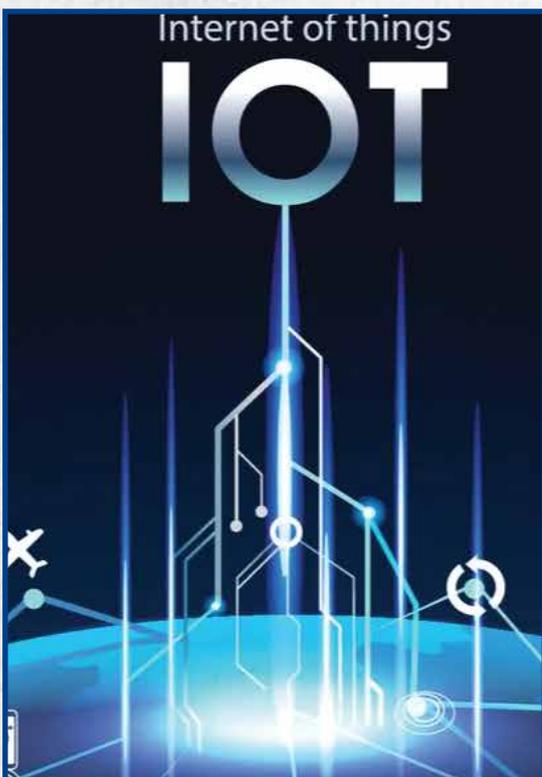|	Course Code	Credit Hours
■ Web Application Development	IT310	3
■ Mobile Application Development	CS436	3
■ Game Design and Development	CS443	3
■ iPhone Application Development	CS465	3
■ Advanced Web Technologies	CS554	3

Internet of Things (Non-SST Students)

Core: Core courses must be passed before taking any elective. Every student enrolled in this minor must pass the following three (3) core courses:

	Course Code	Credit Hours
■ Programming Fundamentals	CC1021	3+1
■ Digital Logic Design	CS2031	3+1
■ Internet of Things (pre-req CC1021 and CS2031)	CS4176	3

Electives: Must pass any one (1) course from the following list of electives:

	Course Code	Credit Hours
■ Embedded Systems	CS4033	3
■ Cloud Computing	CS439	3
■ Computer Vision	CS456	3
■ Robotics	CS5113W	3

Artificial Intelligence (Non-SST Students)

Core: Core courses must be passed before taking any elective. Every student enrolled in this minor must pass the following three (3) core courses:

	Course Code	Credit Hours
Programming Fundamentals	CC1021	3+1
Programming for AI (pre-req CC1021)	AI2101	3+1
Machine Learning (pre-req AI2101)	CS446	3

Electives: Must pass any one (1) course from the following list of electives:

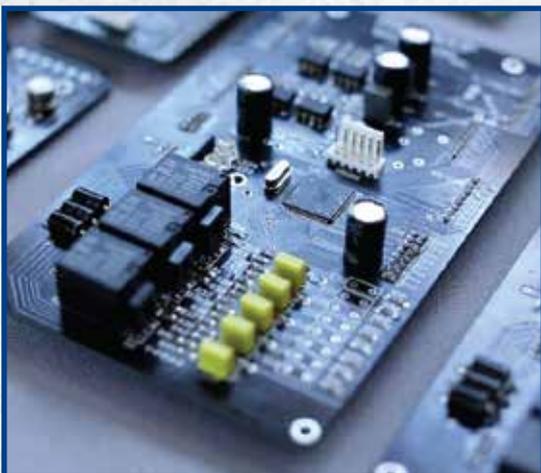|	Course Code	Credit Hours
Artificial Intelligence	CS3151	3
Data Visualization	DS3139	3
Deep Learning and Neural Networks	AI4152	3
Natural Language Processing	CS438	3

School of Engineering (SEN)

Electrical Engineering (Electronic Systems)

List of Minor Courses

	Course Code	Credit Hours
Circuit Analysis	EE110	3
Electrical Network Analysis	EE212	3
Electronic System Design	EE323	3
Digital Electronics	EE445	3
Power Electronics	EE446	3
Industrial Electronics	EE455	3

Electrical Engineering
(Integrated Circuit Design)

List of Minor Courses

	Course Code	Credit Hours
Circuit Analysis	EE110	3
Electronic Devices and Circuits	EE208	3
CMOS Analog Integrated Circuits	EE449	3
CMOS Digital Integrated Circuits	EE450	3
VLSI Circuit Design	EE458	3

Electrical Engineering
(Network and Communication Technologies)

List of Minor Courses

	Course Code	Credit Hours
Computer Networks	EE330	3
Communication Systems	EE410	3
Digital Communications	EE420	3
Network and Protocols	EE461	3
Wireless Communications	EE480	3

Electrical Engineering
(Renewable Energy Technologies)

List of Minor Courses

	Course Code	Credit Hours
Renewable Electrical Energy Resources	EE407	3
Power Distribution and Utilization	EE422	3
Electrical Machine Design	EE424	3
Power Electronics	EE446	3

Electrical Engineering
(Electrical Power and Energy Conversion)

List of Minor Courses

	Course Code	Credit Hours
Electrical Machines	EE340	3
Control Systems	EE360	3
Electrical Machine Design	EE424	3
Power Electronics	EE446	3

Civil Engineering
(Structural Engineering)

List of Minor Courses

	Course Code	Credit Hours
Engineering Mechanics	CE102	3
Mechanics of Solids	CE203	3
Structural Analysis -I	CE204	3
Structural Analysis - II	CE306	3
Plain and Reinforced Concrete -I	CE363	3
Steel Structures	CE461	3
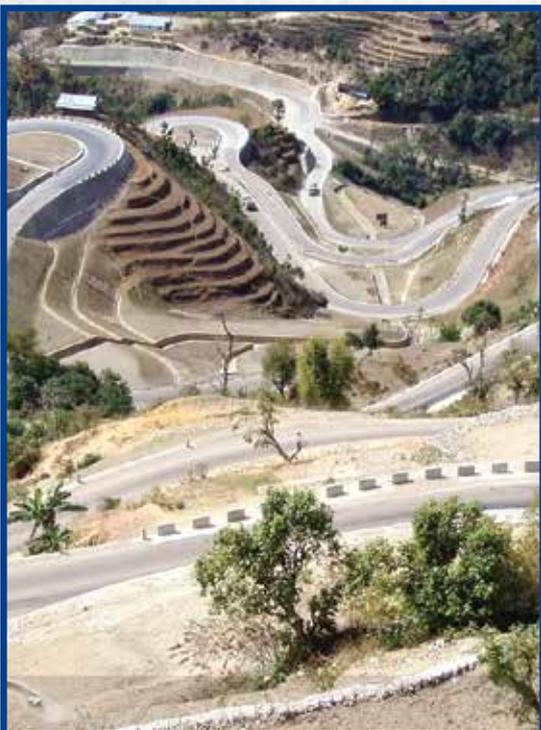
Civil Engineering
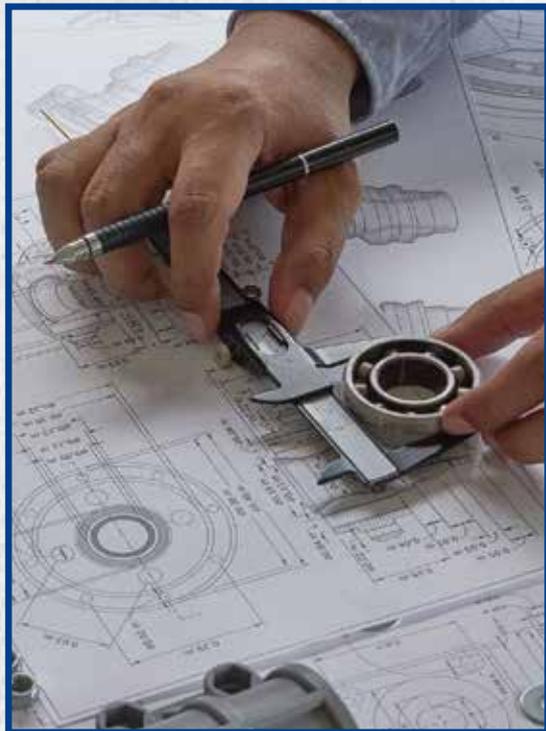## (Geotechnical Engineering)

List of Minor Courses

	Course Code	Credit Hours
Engineering Mechanics	CE102	3
Mechanics of Solids	CE203	3
Geotechnical Engineering -I	CE242	3
Geotechnical Engineering - II	CE343	3
Foundation Engineering	CE445	3
Pavement Engineering	CE474	3

Civil Engineering
(Hydraulics Engineering)

List of Minor Courses

	Course Code	Credit Hours
Engineering Mechanics	CE102	3
Fluid Mechanics	CE251	3
Hydrology and Water Resources Management	MS303	3
Advanced Fluid Mechanics	CE352	3
Hydraulics Engineering	CE457	3
Irrigation Engineering	CE459	3

Mechanical Engineering
(Mechanical Engineering Design)

List of Minor Courses

	Course Code	Credit Hours
Engineering Mechanics-I: Statics	ME122	3
Engineering Mechanics-II: Dynamics	ME123	3
Mechanics of Materials-I	ME221	3
Mechanics of Machines	ME222	3
Machine Design & CAD-I	ME223	3
Machine Design & CAD-II	ME321	3
Mechanics of Materials-II	ME323	3
Mechanical Vibrations	ME421	3
Finite Element Analysis	ME422	3

Mechanical Engineering
(Thermofluids)

List of Minor Courses

	Course Code	Credit Hours
Thermodynamics-I	ME131	3
Thermodynamics-II	ME232	3
Fluid Mechanics-I	ME231	3
Fluid Mechanics-II	ME331	3
Heat & Mass Transfer	ME332	3
Refrigeration & Air Conditioning	ME333	3
Internal Combustion Engines	ME431	3
Power Plants	ME432	3
Computational Fluid Dynamics (CFD)	ME434	3

Industrial Engineering
(Engineering Management)

List of Minor Courses

	Course Code	Credit Hours
Operations Research	EF202	3
Computer Simulations	CS312	3
Project Management	MS301	3
Production Planning and Control	IE324	3
Supply Chain Management	IE412	3
Industrial Maintenance	IE422	3
Industrial Facility Design	EF431	3

Industrial Engineering
(Quality Management)

List of Minor Courses

	Course Code	Credit Hours
Mechanical Measurement and Metrology	EF242	3
Statistical Quality Control	EF243	3
Production planning and control	IE324	3
Total Quality Management	IE401	3
Six Sigma	IE408	3
Health Safety and Environment	IE413	3

School of
Design and Textiles (SDT)

Visual Communication Design

List of Minor Courses

	Course Code	Credit Hours
Digital communication - I	DC101	0+2
Design Fundamentals	GD207	1+2
Graphic Illustration	GD209	0+2
Corporate Design	GD324	1+2
Interactive Media	GD316	1+2
Motion Graphics	GD321	0+2
Concept Art	GD325	0+2

Interior Design

List of Minor Courses

	Course Code	Credit Hours
Digital communication - I	DC101	0+2
Interior Design - I	ID210	0+2
Drawing and Composition	ID206	0+3
Computer Aided Interior Design - I	ID204	0+2
Rendering Layouts - I	ID209	0+2
Sustainable Interior Design	ID363	2+1
Portfolio Presentation	DN413	0+2

Textile Design

List of Minor Courses

	Course Code	Credit Hours
Digital communication - I	DC101	0+2
Color Theory and Application	CT107	1+2
Textile Drawing	TD218	0+2
Design Foundation	TD212	1+2
Surface Design	TD319	1+2
Textile Printing Techniques	TD304	1+2
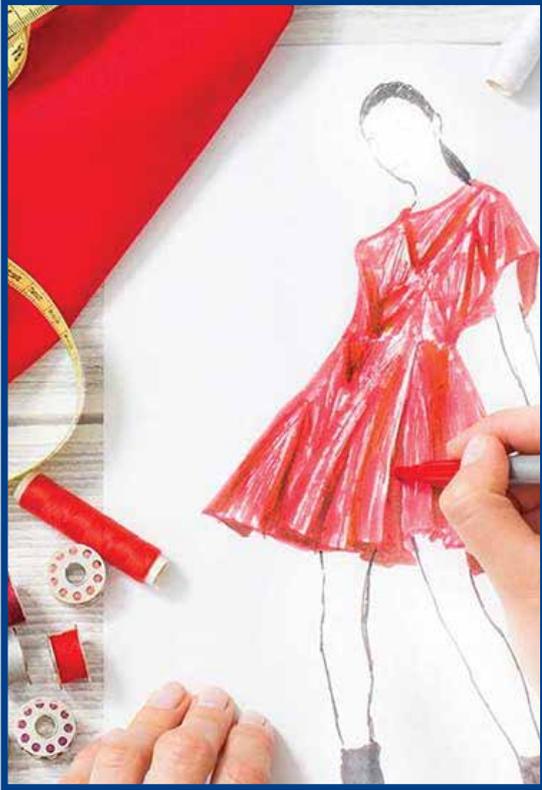
Fashion Design

List of Minor Courses

	Course Code	Credit Hours
Color Theory and Application	CT107	1+2
Fundamentals of Flat Pattern	FD222	0+2
Basics of Draping	FD223	0+2
Digital Fashion and Forecasting	FD227	0+2
Fashion Illustration	FD315	0+2
Surface Design	TD319	1+2
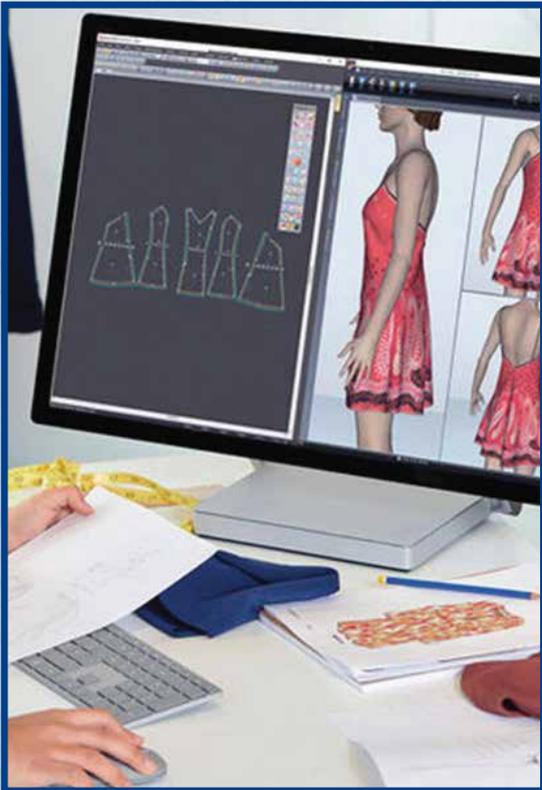
Textile and Clothing

List of Minor Courses

	Course Code	Credit Hours
Intro. to Textile and Clothing	TL105	3+0
Fabric Manufacturing	TL206	3+1
Textile Wet Processing	TL214	2+1
Garment Manufacturing	TL208	3+1
Garment Illustration	TL315	1+2
Anthropometry and Clothing Construction	TL313	1+2

School of Architecture and Planning (SAP)

## Architecture and Design

List of Minor Courses
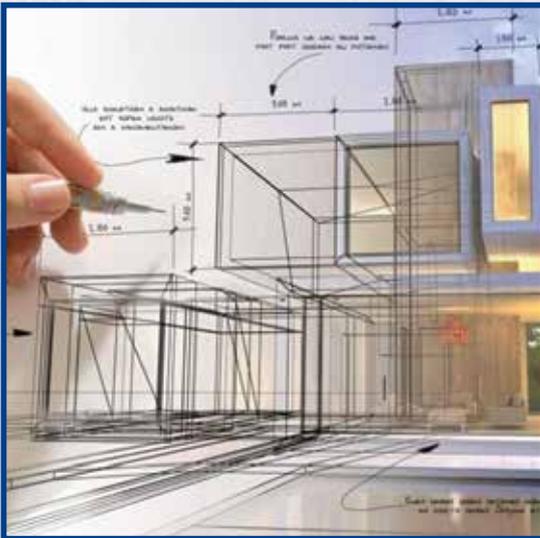
	Course Code	Credit Hours
Design Studio-I	DE111	0+3
Visual Communication-II	AR126	0+3
Design Studio-II	DE121	0+3
History and Conservation	DI317	3+0
Green and Sustainable Architecture	AR401	3+0
Construction Management and Project scheduling	AR514	3+0

Note:
Completion of Minor in Architecture and Design does not qualify the candidate for license in Architecture.

Geographic Information Systems (GIS)

List of Minor Courses
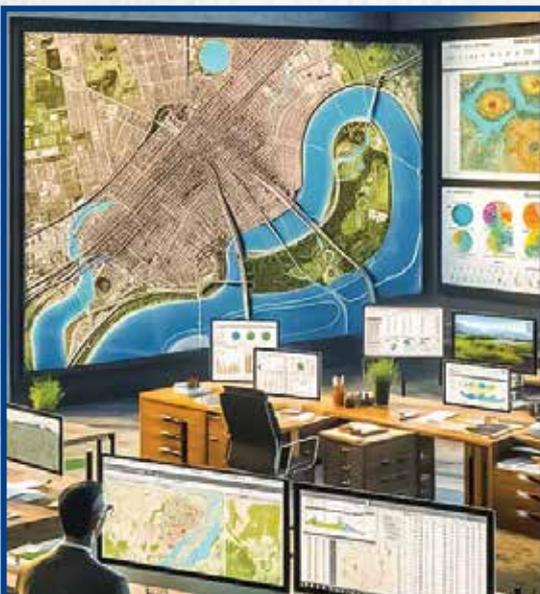
	Course Code	Credit Hours
Mapping and Remote Sensing	CRP105	1+2
History of Cities and Urban Planning	CRP136	3+0
*Introduction to GIS	CRP232	1+2
Climate Change and Disaster Management	CRP222	2+1
Environmental Planning and Management	CRP242	1+1
GIS Analysis and Application in Planning (pre-req CRP232)	CRP328	1+2

Note:
Introduction to GIS course is compulsory for completion of Minor in GIS

School of Media and Communication Studies (SMCS)

Media and Communication Studies

List of Minor Courses

	Course Code	Credit Hours
■ Mobile Journalism	IM231	3
■ Digital Photography and Editing	MC347	3
■ Advertising and Promotional campaign	AP4710	3
■ AI for Media Practices	MT231	3

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CHOICE

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