

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

EC474	Principles of Modern Sonar Systems	(3-1-0) 4	Minor Courses (MC)	
EC475	Advanced Electromagnetics	(3-1-0) 4	EC391	Analog Electronic Circuits (3-0-0) 3
EC476	Milimeter Wave Communication	(3-1-0) 4	EC392	Digital Electronics (3-0-0) 3
EC280	Mini Project in Electrical Circuits and Systems	(0-0-3) 2	EC393	Signals and Systems (3-0-0) 3
EC281	Mini Project in Digital System Design	(0-0-3) 2	EC394	Communication Systems (3-0-0) 3
EC380	Mini Project in Communication Systems and Networks	(0-0-3) 2	EC395	Data Communication and Networks (3-0-0) 3
EC381	Mini Project in Microprocessor and Embedded System	(0-0-3) 2	Project (MP)	
EC382	Mini Project in Analog System Design	(0-0-3) 2	EC498	Major Project 6
EC383	Mini Project in VLSI Design	(0-0-3) 2	Mandatory Learning Courses (MLC)	
EC384	Mini Project in RF Design	(0-0-3) 2	CV110	Environmental Studies (1-0-0) 1
EC385	Mini Project in Digital Signal Processing	(0-0-3) 2	SM111	Professional Ethics & Human Values (1-0-0) 1
			EC390	Seminar (0-0-2) 1
			EC490	Practical Training (0-0-3) 2

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

Suggested Plan of Study:

Semester →	I	II	III	IV	V	VI	VII	VIII
1	EC101	EC102	EC200	EC206	EC300	SM302	Elective	Elective
2			EC201	EC207	EC301	Elective	Elective	Elective
3			EC202	EC208	SM300	Elective	Elective	Elective
4			EC203	EC209	Elective	Elective	EC498*	EC498*
5			EC204	EC210	EC302	EC304	EC490	
6			EC205	EC211	EC303	Elective Mini Project	Elective Mini Project	
7				Elective Mini Project	EC390			
8					Elective Mini Project			

* EC498 Major Project is of one semester duration, to be credited in either 7th or 8th semester.

Degree Requirements:

Category of Courses	Minimum Credits to be Earned
Foundation Courses:	38
Basic Science Courses(BSC)	16
Engineering Science Courses (ESC)	13
Humanities and Social Science Courses (HSC)	9
Program Core Courses:	62
Elective Courses:	39
Elective courses / Mini Projects* /MOOC/GIAN/Industry Courses**	
Major Project (MP): (One semester duration, to be credited in either 7th or 8th semester)	6
Mandatory Learning Courses (MLC):	5
Total Credits	150

* At most 6 credits can be earned from Mini Projects

** At most 5 credits can be earned from MOOC/GIAN/Industry Courses

Students seeking Honors degree shall credit PG courses offered by the Department of Electronics and Communication Engineering. The list of courses available for crediting in a given semester shall be decided by the DUGC. In addition, such students shall do their Major Project in the department. Minimum requirement for Honor Degree is 20 Credits.

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

Department of Electrical and Electronics Engineering (EE) Bachelor of Technology in Electrical and Electronics Engineering

Foundation Courses (FC)			EE347	Design & Development Task in Control Systems	(0-0-3)2
Basic Science Core (BSC)			EE348	Design & Development Task in Power Electronics & Drives	(0-0-3)2
MA110	Engineering Mathematics – I	(3-0-0)3	EE359	Energy Auditing	(3-1-0)4
PH110	Physics	(3-1-0)4	EE360	Microprocessors	(3-1-0)4
PH111	Physics Laboratory	(0-0-2)1	EE361	Power System Communications	(3-1-0)4
MA111	Engineering Mathematics - II	(3-0-0)3	EE362	Operation and control of Power Systems	(3-1-0)4
CY110	Chemistry	(3-0-0)3	EE363	Advanced Digital Signal Processing	(3-1-0)4
CY111	Chemistry Laboratory	(0-0-3)2	EE366	Special Machines and Drives	(3-1-0)4
Engineering Science Core (ESC)			EE369	Embedded System Design	(3-1-0)4
ME110	Elements of Mechanical Engineering	(2-0-0)2	EE371	Power Electronics Applications to Power Systems	(3-1-0)4
CS110	Computer Programming	(3-1-0)4	EE373	Electric Power Stations	(3-1-0)4
CS111	Computer Programming Laboratory	(0-0-2)1	EE374	Electric Energy Systems	(3-1-0)4
AM110	Engineering Mechanics	(3-0-0)3	EE376	Advanced Control Systems	(3-1-0)4
ME111	Engineering Graphics	(1-0-3)3	EE377	Modeling and Simulation Techniques for Dynamic Systems	(3-1-0)4
Humanities and Social Science Core (HSC)			EE378	Shell Scripting with Bash	(3-1-0)4
SM110	Professional Communication	(3-0-0)3	EE379	Incremental Motion Control	(3-1-0)4
SM300	Engineering Economics	(3-0-0)3	EE382	Virtual Instrumentation Laboratory	(0-0-3)2
SM302	Principles of Management	(3-0-0)3	EE384	Energy Auditing Laboratory	(0-0-3)2
Programme Core (PC)			EE385	Microprocessors Laboratory	(0-0-3)2
EE101	Analysis of Electric Circuits	(3-1-0)4	EE386	Digital Signal Processing Laboratory	(0-0-3)2
EE207	Electromagnetic Theory	(3-1-0)4	EE387	Advanced Digital Signal Processing Laboratory	(0-0-3)2
EE213	Electrical Machines-I	(3-1-3)6	EE389	Embedded System Design Laboratory	(0-0-3)2
EE224	Electrical Measurements and Measuring Instruments	(3-1-3)6	EE392	Power System Operation Laboratory	(0-0-3)2
EE226	Analog Electronic Circuits	(3-1-3)6	EE393	Dynamic System Simulation Laboratory	(0-0-3)2
EE143	Mathematics for Electrical Engineers	(3-1-0)	EE397	Design & development task in Signal processing	(0-0-3)2
EE256	Signals and Systems	(3-1-3)6	EE398	Design & development task in Power Systems	(0-0-3)2
EE258	Electrical Machines-II	(3-1-3)6	EE402	HVDC Transmission	(3-1-0)4
EE265	Power System Engineering-I	(3-1-0)4	EE404	Soft Computing and applications	(3-1-0)4
EE276	Digital Electronic Circuits	(3-1-3)6	EE406	Electromagnetic Compatibility	(3-1-0)4
EE308	Power Electronics	(3-1-0)4	EE408	Solid-State Drives	(3-1-0)4
EE326	Linear Control Theory	(3-1-0)4	EE410	Power System Protection	(3-1-0)4
EE350	Power System Engineering-II	(3-1-0)4	EE411	Operation Of Power Systems Under Deregulation	(3-1-0)4
Programme Specific Electives (PSE)			EE412	Random Signal Processing	(3-1-0)4
EE229	Polyphase Systems and Component – Transformations	(3-1-0)4	EE414	Non-Conventional Energy Systems	(3-1-0)4
EE253	Commutator Machines	(3-1-0)4	EE418	Advanced Power Electronics	(3-1-0)4
EE255	Introduction to Algorithms and Data Structures	(3-1-0)4	EE420	Power System Dynamics	(3-1-0)4
EE260	Digital Computer Organization and Architecture	(3-1-0)4	EE422	Principles of Switchgear and Protection	(3-1-0)4
EE281	Commutator Machines Laboratory	(0-0-3)2	EE423	Switchgear and Protection Laboratory	(0-0-3)2
EE295	Electrical Machine Winding Calculations-I	(0-2-3)4	EE427	Computer Networks	(3-1-0)4
EE296	Electrical Machine Winding Calculations-II	(0-2-3)4	EE428	The ARM Core: Architecture and Programming	(3-1-0)4
EE298	Elements of Analog and Digital Communication	(3-1-0)4	EE430	Robot Dynamics and Control	(3-1-0)4
EE303	Distribution Systems Planning and Control	(3-1-0)4	EE432	Machine Learning	(3-1-2)5
EE311	Digital System Design	(3-1-0)4	EE439	Advanced Power Electronics Laboratory	(0-0-3)2
EE312	Power System Harmonics	(3-1-0)4	EE443	Mathematical Morphology & applications to signal processing	(3-1-0)4
EE313	Digital Signal Processing	(3-1-0)4	EE445	Power System Simulation Laboratory-I	(0-0-3)2
EE319	Neural Networks and Applications	(3-1-0)4	EE454	Flexible AC Transmission Systems	(3-1-0)4
EE320	Electrical Safety, Operations, Regulations	(3-0-0)3	EE456	High-Voltage Engineering	(3-1-0)4
EE321	Linear and Nonlinear Systems	(3-1-0)4	EE458	Photovoltaics and Applications	(3-1-0)4
EE324	Electronic Measurements and Instrumentation	(3-1-0)4	EE464	Power Generation and Economics	(3-1-0)4
EE328	Network Synthesis	(3-1-0)4	EE466	Utilization of Electrical Energy	(3-0-0)3
EE329	Traveling Waves on Transmission Systems	(3-1-0)4	EE467	Industrial Electrical Systems	(3-1-0)4
EE331	Distribution Systems Laboratory	(0-0-3)2	EE468	Advanced Electric Drives	(3-1-0)4
EE334	Power Electronics Laboratory	(0-0-3)2	EE469	Renewable Energy Systems	(3-0-0)3
EE335	Digital System Design Laboratory	(0-0-3)2	EE470	Computational Technique for large system analysis	(3-1-0)4
EE337	Power System Harmonics Laboratory	(0-0-3)2			
EE342	Electronic Measurement Laboratory	(0-0-3)2			
EE343	Statistical Foundation for Electrical Engineers	(3-1-0)4			

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

			Compatibility	
EE471	Power System Simulation Laboratory-II	(0-0-3)2	EE802 Energy Management	(3-0-0) 3
EE472	Insulation and Testing Engineering	(3-1-0) 4	EE803 Microcontroller Based System Design	(3-0-0) 3
EE476	Optimisation Techniques	(3-1-0) 4	EE804 Electric Power Quality	(3-0-0) 3
EE478	An Introduction to the Intel IA-32 Architecture	(3-1-0) 4	EE805 Filter Design	(4-0-0) 4
EE489	Advanced Electric Drives Laboratory	(0-0-3) 2	EE806 Sensor Technology and Instrumentation Design	(3-0-0) 3
EE491	Insulation and Testing Engineering Laboratory	(0-0-3) 2	EE807 Optimization Techniques	(4-0-0) 4
EE500	System Analysis in Discrete Time	(3-1-0)4	EE808 Finite Element Methods and Applications	(3-0-0) 3
EE501	Analysis of Nonlinear Circuits	(3-1-0)4	EE809 DC-AC System Interaction	(3-1-0) 4
			EE810 Power System Transients and Overvoltages	(3-0-0) 3
			EE811 Distribution System Automation	(3-0-0) 3
			EE812 Energy Management Lab	(0-0-3) 2
			EE813 Electric Power Quality Lab	(0-0-3) 2
			EE814 Discrete Fourier Transforms and Digital Filter Design Lab	(0-0-3) 2
			EE815 Power Electronics Design Lab	(0-0-3) 2
			EE816 Distribution Automation Lab	(0-0-3) 2
			Power System Operation under	
			EE817 Deregulations	(4-0-0) 4
			EE818 Advanced Semiconductor Devices	(3-0-0) 3
			EE820 Analysis Of Faulted Power Systems	(4-0-0)4
			EE850 FACTS and Custom Power Devices	(3-0-0) 3
			EE851 High-Voltage Testing and Measurements	(3-0-0) 3
			EE852 PV Power Systems	(3-0-0) 3
			EE853 Renewable Energy Systems	(3-0-0) 3
			EE854 Distributed Generation	(3-0-0) 3
			EE855 Communication Networks for Power Systems	(3-0-0) 3
			EE856 Application of Digital Signal Processing Techniques to Power Systems	(4-0-0) 4
			EE857 Design of Embedded Controllers	(3-0-0) 3
			EE858 Electric Drives	(3-0-0) 3
			Computational Methods for Large Power	
			EE859 Systems	(4-0-0) 4
			EE860 Industrial Applications of HV and Fields LabVIEW™ -based Data Acquisition and Instrumentation Lab	(3-0-0) 3
			EE861 Instrumentation Lab	(0-0-3) 2
			EE862 Computer Control of Energy Systems La	(0-0-3) 2
			EE863 Power System Signal Processing Lab	(0-0-3) 2
			EE864 Embedded Controllers Design Lab	(0-0-3) 2
			EE865 High-Voltage Testing Lab	(0-0-3) 2
			Gaseous Insulation & Gas Insulated	
			EE866 System	(3-0-0) 3
			EE867 Power System Simulation Laboratory	(0-0-3) 2
			Switched Electric Networks - A Power	
			EE868 Electronics Perspective	(4-0-0) 4
			EE869 Tensors	(4-0-0) 4
			EE870 Tensor Analysis of Networks	(4-0-0) 4
			EE871 Machine Learning	(3-1-2) 5
			EE872 Smart Grid Control and Operation	(4-0-0) 4

Project (MP)		
EE449	Major Project-I	(0-1-3) 3
EE499	Major Project-II	(0-1-3) 3
Mandatory Learning Courses (MLC)		
CV110	Environmental Studies	(1-0-0) 1
SM111	Professional Ethics and Human Values	(1-0-0) 1
EE448	Seminar	(0-0-2) 1
EE498	Practical Training	(0-0-3) 2
Requirements for a Minor Degree in E&E (20 credits)		
EE230	Electric Circuits	(3-1-0) 4
EE261	Basic Electric Machines	(3-1-0) 4
EE310	Electric Power System	(3-1-0) 4
EE370	Electrical and Electronics Measuring Instruments and Techniques	(3-1-0) 4
EE415	Power Electronics in Power Control	(3-1-0) 4
Honors Degree in E&E		
Students seeking Honors degree shall credit five PG courses offered by the Department of Electrical and Electronics Engg. and as decided by DUGC from the following list. Minimum requirement for Honors degree is 20 credits		
Courses for Honors Degree		
EE700	Computer-Aided Protection of Power Sys	(4-0-0) 4
EE701	Power Electronics: Modeling and Design	(4-0-0) 4
EE702	Power System Modeling and Analysis	(4-0-0) 4
EE703	Power System Modeling and Analysis Lab	(0-0-3) 2
EE750	Computer Control of Energy Systems	(4-0-0) 4
EE751	Control Systems	(4-0-0) 4
EE800	Fuzzy-Neural Control	(4-0-0) 4
EE801	EMI Testing and Design for	(4-0-0) 4

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

Suggested Plan of Study

Semester →	I	II	III	IV	V	VI	VII	VIII
1	MA110	MA111	EE213	EE226	SM300	SM302	Elective	Elective
2	CY110	PH110	EE207	EE258	EE326	Elective	Elective	Elective
3	CY111	PH111	EE276	EE265	EE350	Elective	Elective	Elective
4	AM110	ME110	EE256	EE224	Elective	Elective	Elective	Elective
5	CS110	ME111	EE308	Elective	Elective	Elective	EE498	EE499
6	CS111	EE143	Elective	Elective	Elective	Elective	EE449	EE448
7	EE101	SM110						
8	CV110	SM111						

Degree Requirements:

Category of Courses	Minimum Credits to be Earned
Foundation Courses (FC)	38
<i>Basic Science Core (BSC)</i>	16
<i>Engineering Science Core (ESC)</i>	13
<i>Humanities and Social Science Core (HSC)</i>	09
Programme Core (PC)	64
Electives	37
Project (MP): Major Project	06
Mandatory Learning Courses (MLC)	05
Total	150

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

Department of Information Technology (IT)

Bachelor of Technology in Information Technology

Basic Science Core (BSC)

MA110	Engineering Mathematics – I	(3-0-0)	3
PH110	Physics	(3-1-0)	4
PH111	Physics Laboratory	(0-0-2)	1
MA111	Engineering Mathematics – II	(3-0-0)	3
CY110	Chemistry	(3-0-0)	3
CY111	Chemistry Laboratory	(0-0-3)	2

Engineering Science Core (ESC)

ME110	Elements of Mechanical Engineering	(2-0-0)	2
ME111	Engineering Graphics	(1-0-3)	3
AM110	Engineering Mechanics	(3-0-0)	3
CS110	Computer Programming	(3-1-0)	4
CS111	Computer Programming Lab	(0-0-2)	1

Humanities and Social Science Core (HSC)

SM110	Professional Communication	(3-0-0)	3
SM300	Engineering Economics	(3-0-0)	3
SM302	Principles of Management	(3-0-0)	3

Programme Core (PC)

IT110	Digital System Design	(3-0-2)	4
IT150	Object Oriented Programming	(3-0-2)	4
IT200	Computer Communication and Networking	(4-0-0)	4
IT201	Computer Organization and Architecture	(3-0-0)	3
IT202	Data Structures and Algorithms-I	(3-0-0)	3
IT203	Discrete Mathematics	(3-0-0)	3
IT204	Signals and Systems	(3-0-2)	4
IT205	Computer Networking Lab	(0-0-3)	2
IT206	Data Structures and Algorithms-I Lab	(0-0-3)	2
IT250	Automata and Compiler Design	(3-0-2)	4
IT251	Data Structures and Algorithms-II	(3-0-2)	4
IT252	Database Systems	(3-0-2)	4
IT253	Operating Systems	(3-0-2)	4
IT254	Web Technologies and Applications	(3-0-2)	4
IT300	Design and Analysis of Algorithms	(3-0-2)	4
IT301	Parallel Computing	(3-0-2)	4
IT302	Probability and Statistics	(3-0-2)	4
IT303	Software Engineering	(3-0-2)	4
IT350	Data Analytics	(3-0-2)	4
IT351	Human Computer Interaction	(3-0-2)	4
IT352	Information Assurance and Security	(3-0-2)	4

Major Project (MP)

IT449	Major Project-I	(0-0-3)	2
IT499	Major Project-II	(0-0-6)	4

Mandatory Learning Courses (MLC)

CV110	Environmental Studies	(1-0-0)	1
SM111	Professional Ethics and Human Values	(1-0-0)	1
IT290	Seminar		1
IT440	Practical Training		2

Programme Specific Electives (PSE)

IT360	Information Systems	(3-0-2)	4
IT361	Paradigms of Programming	(3-0-2)	4
IT362	Computer Graphics	(3-0-2)	4
IT363	Microprocessors and Interfacing	(3-0-2)	4
IT364	Performance Modeling	(3-0-2)	4
IT365	Advanced Computer Networks	(3-0-2)	4
IT366	Object Oriented Analysis and Design	(3-0-2)	4
IT400	Perceptual Audio Processing	(3-0-2)	4
IT401	Perceptual Video Processing	(3-0-2)	4
IT402	Soft Computing	(3-0-2)	4
IT403	Genetic Algorithms	(3-0-2)	4
IT404	Artificial Neural Networks	(3-0-2)	4
IT405	Fuzzy System Models	(3-0-0)	3
IT406	Distributed Computing Systems	(3-0-2)	4
IT407	Technologies for Internet of Things	(3-0-2)	4
IT408	Mobile Computing	(3-0-0)	3
IT409	Embedded Systems	(3-0-0)	3
IT410	Bioinformatics	(3-0-0)	3
IT411	Knowledge Management	(3-0-0)	3
IT412	Time Series Analysis	(3-0-0)	3
IT413	System Integration	(3-0-0)	3
IT414	Data Warehousing and Data Mining	(3-0-2)	4
IT415	Middleware Technologies	(3-0-2)	4
IT416	Computer Vision	(3-0-2)	4
IT417	Pattern Recognition	(3-0-2)	4
IT418	Cloud Computing	(3-0-2)	4
IT419	Wireless Sensor Networks	(3-0-2)	4
IT420	Mobile Adhoc Networks	(3-0-2)	4
IT421	Semantic Web Technologies	(3-0-2)	4
IT422	Virtual Reality	(3-0-2)	4
IT423	Rich Internet Applications	(3-0-2)	4
IT450	Web Services	(3-0-0)	3
IT451	Software Architecture	(3-0-0)	3
IT452	Advanced Computer Architecture	(3-0-0)	3
IT453	Transaction Processing	(3-0-0)	3
IT454	Software Quality Assurance	(3-0-0)	3
IT455	Information Technology for Healthcare	(3-0-0)	3
IT456	Enterprise Resource Planning and Systems	(3-0-0)	3
IT457	Natural Language Processing	(3-0-2)	4
IT458	Information Retrieval	(3-0-2)	4
IT459	Simulation and Modelling	(3-0-2)	4
IT460	E-Commerce	(3-0-0)	3
IT461	Advanced Database Systems	(3-0-2)	4
IT462	Number Theory and Cryptography	(3-0-2)	4
IT463	Linux Kernel Internals	(3-0-2)	4

B.Tech (Minor) in Information Technology for Other Branches

IT210	Data Structures and Algorithms	(3-0-2)	4
IT252	Database Systems	(3-0-2)	4
IT254	Web Technologies and Applications	(3-0-2)	4
IT301	Parallel Computing	(3-0-2)	4
IT350	Data Analytics	(3-0-2)	4

For B.Tech (Honors) in Information Technology :

Students seeking Honors degree shall credit five courses of M.Tech (IT) including Program Core/Electives, offered by the Department of Information Technology and as decided by DUGC with 20 credits.

For other details, please see M.Tech (IT) Curriculum.

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

Suggested Plan of Study

Semester →	VII						VIII	
	I	II	III	IV	V	VI		
1	MA110	MA111	IT200	IT250	IT300	IT350	IT440	IT499
2	CY110	PH110	IT201	IT251	IT301	IT351	IT449	Elective-5
3	CY111	PH111	IT202	IT252	IT302	IT352	Elective-2	Elective-6
4	AM110	ME110	IT203	IT253	IT303	SM302	Elective-3	Elective-7
5	CS110	ME111	IT204	IT254	SM300	Elective-1	Elective-4	---
6	CS111	SM110	IT205	IT290	---	---	---	---
7	CV110	SM111	IT206	---	---	---	---	---
8	IT110	IT150	---	---	---	---	---	---

Degree Requirements:

Category of Courses	Minimum Credits to be Earned
Basic Science Core (BSC)	16
Engineering Science Core (ESC)	13
Humanities and Social Sciences Core (HSC)	09
Programme Core (PC)	77
Electives (ELE): Programme Specific Electives (PSE)	24
Major Project (MP)	06
Mandatory Learning Courses (MLC)	05
Total	150

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

Department of Chemical Engineering Bachelor of Technology in Chemical Engineering

Basic Science Core (BSC)

MA110	Engineering Mathematics I	(3-0-0)3
PH110	Physics	(3-1-0)4
PH111	Physics Laboratory	(0-0-2)1
MA111	Engineering Mathematics II	(3-0-0)3
CY110	Chemistry	(3-0-0)3
CY111	Chemistry Laboratory	(0-0-3)2
CY205	Organic Chemistry	(3-0-0)3
CY255	Technical Analysis Laboratory	(0-0-4)2
CY300	Instrumental Methods of Analysis	(3-0-0)3

Engineering Science Core (ESC)

EE110	Elements of Electrical Engineering	(2-0-0)2
EC100	Elements of Electronics & Communication Engineering	(2-0-0)2
ME110	Elements of Mechanical Engineering	(2-0-0)2
CS 110	Computer Programming	(3-1-0)4
CS 111	Computer Programming Lab	(0-0-2)1
AM110	Engineering Mechanics	(3-0-0)3
ME111	Engineering Graphics	(1-0-3)3

Humanities and Social Sciences Core (HSC)

SM 110	Professional Communication	(3-0-0)3
SM 300	Engineering Economics	(3-0-0)3
SM 302	Principles of Management	(3-0-0)3

Programme Core (PC)

CH 150	Process Calculations	(2-2-0)4
CH 200	Momentum Transfer	(3-1-0)4
CH 201	Particulate Technology	(2-1-0)3
CH 202	Chemical Engg. Thermodynamics	(3-1-0)4
CH 203	Transport Phenomena	(2-2-0)4
MA 207	Numerical Methods	(3-0-0)3
MA 211	Laplace and Z Transforms	(1-0-0)1
CH 204	Computer Simulation Lab	(0-0-3)2
CH 250	Heat Transfer	(3-1-0)4
CH 251	Mass Transfer-I	(3-1-0)4
CH 252	Chemical Reaction Engg.-I	(2-1-0)3
CH 253	Momentum Transfer Lab	(0-0-3)2
CH 254	Particulate Technology Lab	(0-0-3)2
CH 300	Chemical Reaction Engineering – II	(2-1-0)3
CH 301	Mass Transfer – II	(3-1-0)4
CH302	Process Dynamics & Control	(3-1-0)4
CH 303	Heat Transfer Operations Lab	(0-0-3)2
CH 350	Chemical Process Industries	(3-0-0)3
CH 351	Process Design of Chemical Equipment	(3-1-0)4
CH352	Mass Transfer Operations Lab	(0-0-3)2
CH 353	Design and Simulation Lab	(0-0-2)1

CH 400	Pollution Control and Safety in Process Industries	(3-0-0)3
CH 401	Chemical Reaction Engg. & Process Control Lab	(0-0-3)2

Major Project (MP)

CH 449	Major Project I	(0-0-3) 2
CH 499	Major Project II	(0-0-6) 4

Mandatory Learning Courses (MLC)

SM 111	Professional Ethics and Human values	(1-0-0)1
CV110	Environmental Sciences	(1-0-0)1
CH 440	Practical Training	01
CH448	Seminar	02

Electives (Ele)

CH450	Process Instrumentation	(3-0-0)3
CH451	Energy Technology	(3-0-0)3
CH452	Petroleum Refining Processes	(3-0-0)3
CH453	Biochemical Engineering	(3-0-0)3
CH454	Introduction to Molecular Simulations	(2-0-2)3
CH455	Energy Conservation & Management in Process Industries	(3-0-0)3
CH456	Fuel Cell Engineering	(3-0-0)3
CH457	Chemical Project Engineering	(3-0-0)3
CH458	Biology for Chemical Engineers	(3-0-0)3

Minor Degree Courses

CH150	Process Calculations	(2-2-0)4
CH202	Chemical Engineering Thermodynamics	(3-1-0)4
CH203	Transport Phenomena	(2-2-0)4
CH252	Chemical Reaction Engineering I	(2-1-0)3
CH302	Process Dynamics and Control	(3-1-0)4
Minimum Credits to be earned		19

Courses for Honours Degree in Chemical Engineering

CH 701	Molecular and Turbulent Transport	(3-1-0) 4
CH 702	Process System Analysis and Control	(3-1-0) 4
CH 705	Process Modelling and Simulation	(3-0-2) 4
CH 706	Statistical and Irreversible Thermodynamics	(3-1-0) 4
CH 707	Chemical Reactor Design	(3-1-0) 4
CH764	Bioreactor Engineering	(3-1-0) 4
Minimum Credits to be earned		20

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

Suggested Plan of Study:

Slot/Semester	I	II	III	IV	V	VI	VII	VIII
1	MA110	MA111	CH200	CH250	CH300	CH350	CH400	CH499
2	PH110	CY110	CH201	CH251	CH301	CH351	CH401	<i>Elective</i>
3	PH111	CY111	CH202	CH252	CH302	SM302	CH440	<i>Elective</i>
4	EE110	AM110	CH203	CY205	SM300	CY300	CH448	<i>Elective</i>
5	EC100	CS110	MA207	CH253	CH303	CH352	CH449	<i>Elective</i>
6	ME110	CS111	MA211	CH254	CY255	CH353	<i>Elective</i>	
7	ME111	CH150	CH204			<i>Elective</i>	<i>Elective</i>	
8	SM100	CV110						
9	SM111							

Degree Requirements:

Category of Courses	Minimum Credits to be earned
Foundation Courses	
Basic Science Core (BSC)	24
Engineering Science Core (ESC)	17
Humanities and Social Sciences Core (HSC)	09
Programme Core (PC)	68
Elective Courses (Ele)	21
Mandatory Learning Courses (MLC)	05
Major Project (MP)	06
Total	150

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

Department of Mechanical Engineering

Bachelor of Technology in Mechanical Engineering

Foundation Courses:			ME353	Automation Systems	(3-0-0)3
Basic Science Core (BSC)			ME354	Operations Research	(3-0-0)3
MA110	Engineering Mathematics - I	(3-0-0)3	ME451	Mechanical Lab - II	(0-0-3)2
MA111	Engineering Mathematics - II	(3-0-0)3	ME452	Machine Shop - II	(0-0-3)2
CY110	Chemistry	(3-0-0)3	Electives		
CY111	Chemistry Laboratory	(0-0-3)2	ME311	Finite Element Method	(3-0-0)3
PH110	Physics	(3-1-0)4	ME312	Theory of Elasticity	(3-0-0)3
PH111	Physics Laboratory	(0-0-2)1	ME313	Mechatronic Systems	(3-0-0)3
MA207	Numerical Methods	(3-0-0)3	ME314	Product Design and Development	(3-0-0)3
MA208	Probability Theory and Applications	(3-0-0)3	ME315	Theory of Metal Forming	(3-0-0)3
Engineering Science Core Courses (ESC)			ME316	Welding Technology	(3-0-0)3
AM110	Engineering Mechanics	(3-0-0)3	ME317	Basics of Computational Fluid Dynamics	(3-0-0)3
CS110	Computer Programming	(3-1-0)4	ME318	Principles of Turbomachinery	(3-0-0)3
CS111	Computer Programming Laboratory	(0-0-2)1	ME411	Theory of Fatigue and Analysis	(3-0-0)3
EE110	Elements of Electrical Engineering	(2-0-0)2	ME412	Experimental Stress Analysis	(3-0-0)3
EC100	Elements of Electronics and Communications Engineering	(2-0-0)2	ME413	Synthesis of Mechanisms	(3-0-0)3
ME111	Engineering Graphics	(1-0-3)3	ME414	Microsystem Technology	(3-0-0)3
AM217	Mechanics of Solids Lab	(0-0-2)1	ME415	Hydraulics and Pneumatic Control	(3-0-0)3
AM317	Fluid Mechanics and Machinery Lab	(0-0-2)1	ME416	Robotics	(3-0-0)3
Humanities and Social Science Core (HSC)			ME417	Non-Destructive Evaluation	(3-0-0)3
SM110	Professional Communication	(3-0-0)3	ME418	Production and Operations Management	(3-0-0)3
SM300	Engineering Economics	(3-0-0)3	ME419	Processing of Composites	(3-0-0)3
SM302	Principles of Management	(3-0-0)3	ME420	IC Engines	(3-0-0)3
Programme Core (PC)			ME421	Refrigeration and Air Conditioning	(3-0-0)3
ME112	Materials Science and Engineering	(3-0-0)3	ME422	Mechanics of Compressible Flow	(3-0-0)3
ME113	Mechanics of Deformable Bodies	(3-0-0)3	ME423	Multi Body Dynamics	(3-0-0)3
ME201	Basic Engineering Thermodynamics	(3-1-0)4	ME424	Vehicle Dynamics	(3-0-0)3
ME202	Fluid Mechanics and Machinery	(3-1-0)4	ME425	Contemporary Concepts in Product Design	(3-0-0)3
ME203	Mechanics of Machinery	(3-1-0)4	ME426	Automotive Electronics	(3-0-0)3
ME204	Basic Manufacturing Processes	(3-1-0)4	ME427	Introduction to Additive Manufacturing	(3-0-0)3
ME205	Workshop Practice	(0-0-3)2	ME428	Non-Traditional Machining Processes	(3-0-0)3
ME251	Applied Thermodynamics	(3-0-0)3	ME429	Energy Auditing and Management	(3-0-0)3
ME252	Analysis and Design of Machine Components	(3-1-0)4	ME430	Gas Turbines and Jet Propulsion	(3-0-0)3
ME253	Computer Aided Engineering	(3-0-0)3	Project (MP)		
ME254	Manufacturing Technology	(3-0-0)3	ME498	Major Project - 1	(0-0-4)2
ME255	Engineering Drawing	(1-0-3)3	ME499	Major Project - 2	(0-0-6)3
ME301	Metrology and Instrumentation	(4-0-0)4	Mandatory Learning Courses (MLC)		
ME302	Heat Transfer	(3-0-0)3	SM111	Professional Ethics & Human Values	(1-0-0)1
ME303	Design of Mechanical Drives	(3-0-0)3	CV110	Environmental Studies	(1-0-0)1
ME304	Automobile Engineering	(3-0-0)3	ME440	Practical Training / Internship	(0-0-3)2
ME305	Control Engineering	(3-0-0)3	ME490	Seminar	(0-0-2)1
ME306	Metrology and CAD Lab	(0-0-3)2	Minor Courses		
ME307	Machine Shop - 1	(0-0-3)2	ME501	Manufacturing Engineering	(3-1-0) 4
ME308	Mechanical Lab - 1	(0-0-3)2	ME502	Thermal Engineering	(3-1-0) 4
ME351	Energy Engineering	(3-0-0)3	ME503	Mechanical Design	(3-1-0) 4
ME352	Machine Dynamics and Vibrations	(3-1-0)4	ME504	Production Management	(3-1-0) 4
			ME505	Industrial Automation	(3-1-0) 4

Honors Degree in Mechanical Engineering: Students seeking Honors degree shall credit five PG courses offered by the Department of Mechanical Engg. and as decided by DUGC. Minimum requirement for Honors degree is 15 credits.

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

Suggested Plan of Study

Sem →	I	II	III	IV	V	VI	VII	VIII
1	ME112/ ME113	ME113/ ME112	MA207	MA208	ME301	ME351	Elective-2	Elective-5
2			ME201	ME251	ME302	ME352	Elective-3	Elective-6
3			ME202	ME252	ME303	ME353	Elective-4	Elective-7
4			ME203	ME253	ME304	ME354	ME498	ME440
5			ME204	ME254	ME305	SM300		ME451
6			AM217/ME205	ME255	SM302	Elective-1		ME452
7				ME205 / AM217	ME306 / ME307	ME307 / ME306		ME499
8					AM317/ME308	ME308/AM317		ME490

Degree Requirements:

Category of Courses	Minimum Credits to be Earned
Foundation Courses:	48
Programme core:	79
Programme Electives:	21
Project (MP):	05
Mandatory Learning Courses (MLC):	05
Total:	158

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

Department of Metallurgical and Material Engineering

Bachelor of Technology in Metallurgical and Materials Engineering

Basic Science Core (BSC)

MA110	Engineering Mathematics – I	(3-0-0)3	MT353	Ceramics and Polymers Lab	(0-0-3)2
PH110	Physics	(3-1-0)4	MT354	Heat Treatment Lab	(0-0-3)2
PH111	Physics Laboratory	(0-0-2)1	MT400	Corrosion Engineering	(3-0-1)4
MA111	Engineering Mathematics – II	(3-0-0)3	MT401	Metal Forming	(2-0-1)3
CY110	Chemistry	(3-0-0)3			
CY111	Chemistry Laboratory	(0-0-3)2			

Electives (Ele)

MT306	Fatigue, Fracture and Creep	(3-0-0)3			
MT307	Fuels and Furnaces	(2-1-0)3			
MT355	Powder Metallurgy	(3-0-0)3			

Engineering Science Core (ESC)

AM110	Engineering Mechanics	(3-0-0)3			
EC100	Elements of Electronics and Communication Engg	(2-0-0)2	MT356	Joining of Metals	(3-0-0)3
EE110	Elements of Electrical Engg.	(2-0-0)2	MT357	Aerospace Materials	(3-0-0)3
ME110	Elements of Mechanical Engg.	(2-0-0)2	MT402	Foundry Technology	(2-0-1)3
CS110	Computer Programming	(3-1-0)4	MT403	Phase Transformations	(3-0-0)3
CS111	Computer Programming Lab	(0-0-2)1	MT404	Extraction of Non-Ferrous Metals	(3-0-0)3
ME111	Engineering Graphics	(1-0-3)3	MT405	Secondary Refining of Steels	(3-0-0)3
AM200	Mechanics of Materials	(3-0-0)3	MT406	Process Plant Materials	(3-0-0)3
ME200	Workshop	(0-0-2)1	MT407	Advanced Engineering Materials	(3-0-0)3

Humanities and Social Science Core (HSC)

SM110	Professional Communication	(3-0-0)3	MT410	Fracture of Engineering Materials	(3-0-0)3
SM302	Principles of Management	(3-0-0)3	MT451	Composite Materials	(3-0-0)3
			MT452	Advanced Welding Technology	(3-0-0)3
			MT453	Surface Engineering Modeling & Simulation in Materials	(3-0-0)3

Programme Core (PC)

MT160	Introduction to Materials Science & Technology	(3-1-0)4	MT454	Processes	(3-0-0)3
MT200	Testing of Materials	(2-0-1)3	MT455	Science & Technology of Nanomaterials	(3-0-0)3
MT201	Metallurgical Thermodynamics & Kinetics	(3-1-0)4	MT456	Advanced Microscopic Techniques	(3-0-0)3
MT202	Physical Metallurgy	(3-1-0)4	MT457	Smart Materials and Sensors	(3-0-0)3

MT203	Polymer Science and Technology	(3-0-0)3	Project (MP)		
MT204	Mineral Processing and Beneficiation	(3-0-1)4	MT442	Major Project – I	(0-0-2)1
MT251	Transport Phenomena	(3-1-0)4	MT492	Major Project – II	(0-0-6)3
MT252	Phase Diagrams	(3-1-0)4			

Mandatory Learning Courses (MLC)

MT253	Principles of Extractive Metallurgy	(3-1-0)4	CV110	Environmental Studies	(1-0-0)1
MT254	X-ray Diffraction & Electron Microscopy	(3-1-0)4	SM111	Professional Ethics & Human Values	(1-0-0)1
MT255	Instrumental Methods of Analysis	(3-0-1)4	MT440	Practical Training	(0-0-3)2
MT256	Measurements and Control	(3-0-0)3	MT441	Seminar	(0-0-2)1

Courses for Minor in Metallurgical and Materials Engg

MT202	Physical Metallurgy	(3-1-0)4			
MT203	Polymer Science and Technology	(3-0-0)3	MT252	Phase Diagrams	(3-1-0)4
MT253	Principles of Extractive Metallurgy	(3-1-0)4	MT351	Ceramics and Refractories	(3-0-0)3

Total credits: 15

Students seeking Honors degree shall credit five PG courses offered by the Department of Metallurgical and Materials Engg. and as decided by DUGC. Minimum requirement for Honors degree is 15 credits.

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL -

Suggested Plan of Study:

Semester →	II	III	IV	V	VI	VII	VIII
1	MT160	MT200	MT251	MT300	MT350	MT400	Elective
2		MT201	MT252	MT301	MT351	MT401	Elective
3		MT202	MT253	MT302	MT352	MT440	Elective
4		MT203	MT254	MT303	MT353	MT441	MT492
5		MT204	MT255	MT304	MT354	MT442	
6		AM200	MT256	MT305	Elective	Elective	
7		ME200		SM302	Elective	Elective	
8							
9							
10							

Degree Requirements:

Category of Courses	Minimum credits to be Earned
Foundation Courses (FC) [Including Basic Science Core (BSC)- 16, Engineering Science Core (ESC)-21 and Humanities and Social Science Core (HSC)- 6]	43
Programme Core (PC)	82
Electives (E)	21
Project (MP)	4
Mandatory Learning Courses (MLC)	5
Total	155

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

COURSE CONTENTS - UG

Departments

i.	Dept. of Applied Mechanics & Hydraulics	02
ii.	Dept. of Civil Engineering	07
iii.	Dept. of Mining Engineering	17
iv.	Dept. of Computer Science & Engineering	27
v.	Dept. of Electronics & Communication Engineering	41
vi.	Dept. of Electrical & Electronics Engineering	59
vii.	Dept. of Information Technology	76
viii.	Dept. of Chemical Engineering	91
ix.	Dept. of Mechanical Engineering	97
x.	Dept. of Metallurgical & Materials Engineering	110
xi.	Dept. of Chemistry	123
xii.	Dept. of Physics	128
xiii.	Dept. of Mathematical & Computational Sciences	130
xiv.	School of Management	137

Department of Applied Mechanics and Hydraulics

AM110 ENGINEERING MECHANICS

(3-0-0) 3

Fundamentals of force system, Concept of Rigid body and deformable bodies, Free body diagrams. Support Reactions-Determinate and Indeterminate structures. Analysis of Trusses, Frames and Machines. Centroid and Moment of Inertia of plane areas. Shear Force and Bending Moment Diagrams. Simple stress and strain, Hooke's Law, Mechanical properties of materials, Elastic Constants.

Merian, J.L, Kraige, L.G. Engineering Mechanics – Statics, 5th Edition, Wiley Publishers, New-Delhi, 2007.

Beer & Johnston, Mechanics for Engineers, 4th Edition, McGraw – Hill, New Delhi, 1987.

Timoshenko, S.P., Young, D.H., Rao, J.V. Engineering Machines, 4th Edition, McGraw-Hill, Singapore, 1956.

Singer, F.L. Strength of Materials, Third Edition, Harper and Row Publishers, New York, 1980.

Hearn, E.J., Mechanics of Materials, Pergaman Press, England, 1972.

Beer and Johnston E. R. Mechanics of Materials, 3rd Edition, Tata McGraw Hill, New Delhi, 2007.

AM200 MECHANICS OF MATERIALS

(3-0-0) 3 PREREQ: AM110

Simple flexure theory, Bending stress and shearing stress distribution across sections. Deflection of beams, Macaulay's method for deflection of statically determinate beams. Compound stresses - analytical method, graphical method - Mohr's circle of stresses. Torsion, Transmission of power through hollow and solid shafts. Beams of uniform strength, springs, Combined bending and torsion, Strain energy, Theories of failure, Columns & struts, Thick and thin pressure vessels.

Singer, F.L. Strength of Materials, 3rd Edition, Harper and Row Publishers, New York, 1980.

Hearn, E.J., Mechanics of Materials, Pergaman Press, England, 1972.

Beer and Johnston E. R. Mechanics of Materials, 3rd Edition, Tata McGraw Hill, New-Delhi, 2007.

AM216 STRENGTH OF MATERIALS LAB

(0-0-3) 2

Tension test on mild steel and cast iron, Compression test on mild steel and cast iron, Torsion test on mild steel rod, Rockwell and Brinell hardness tests, Impact test (Charpy and Izod) on mild steel, Bending test on mild steel rod and wood, Shear test on mild steel plate and rod, tests on leaf and helical spring. Demonstration on fatigue test.

Hearn, E.J., Mechanics of Materials, Pergaman Press, England, 1972.

Beer and Johnston E. R. Mechanics of Materials, 3rd Edition, Tata McGraw Hill, New-Delhi, 2007.

AM217 MECHANICS OF SOLIDS LAB

(0-0-2) 1

Tension tests on mild steel and cast iron, Compression tests on mild steel and cast iron, Shear tests, Bending test on mild steel, Torsion test, Hardness test and Impact test. Demonstration on fatigue test and springs

Hearn, E.J., Mechanics of Materials, Pergaman Press, England, 1972.

Beer and Johnston E. R. Mechanics of Materials, 3rd Edition, Tata McGraw Hill, New-Delhi, 2007.

AM250 MECHANICS OF FLUIDS

(3-0-0) 3

Properties and classification of fluids. Basic equation of fluid statics. Manometers. Buoyant force. Kinematics of fluid flow. Continuity equation. Bernoulli's equation. Momentum equation. Flow measurements: Brief introduction. Dimensional analysis. Model law. Basics of pipe flow. Hagen-Poiseuille equation. Darcy-Weisbach equation. Moody's diagram. Uniform flow in open channels.

Modi, P.N and Seth, S.M., Hydraulics and Fluid Mechanics, Standard Book House, Delhi, 2010.

Streeter. V.L and Wylie. E.B., Fluid Mechanics, McGraw Hill Book Company, New York, 1997.

Ven Te Chow, Open Channel Hydraulics, McGraw Hill, New York 1959.

AM300 WATER RESOURCES ENGINEERING

(3-0-0) 3 PREREQ: AM250

Hydrology: Hydrologic cycle, Water budget, Catchment. Precipitation: types, measurement, intensity, duration, temporal and spatial analysis. Infiltration, soil moisture, evaporation, transpiration, Groundwater. Runoff: components, factors, hydrographs, unit hydrograph, flood estimation. Irrigation: objectives, methods, irrigation water requirements. Components of irrigation system and design principles. Water Power Engineering: Basic principles, types of schemes

Subramanya K, Engineering Hydrology, Tata McGraw Hill, 3rd Edition, 2008.

Garg S. K, Irrigation Engineering and Hydraulic Structures, Khanna Publishers, 2008.

Ven Te Chow, LW Mays and DR Maidment., Applied Hydrology, McGraw Hill, 1988.

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

AM316 HYDRAULICS LAB

(0-0-3) 2 PREREQ: AM250

Calibration of V notch, Rectangular Notch; Venturimeter, Orifice meter, Water meter. Friction factor of pipes. Impact of jet on vanes. Tests on centrifugal pump, reciprocating pump, Pelton wheel turbine, Francis turbine. Hydraulics jump, Syphons, Demonstration experiments (pressure gauge, Pitot tube, Kaplan turbine)
Modi, P.N and Seth, S.M., Hydraulics and Fluid Mechanics, Standard Book House, Delhi, 2010

AM317 FLUID MECHANICS AND MACHINERY LAB

(0-0-2) 1 PREREQ: ME202

Calibration of V notch, Venturimeter, Orifice meter, Water meter. Friction factor of pipes. Impact of jet on vanes. Tests on centrifugal pump, reciprocating pump, Pelton wheel turbine. Demonstration experiments (pressure gauge, Pitot tube, Kaplan turbine)
Modi, P.N and Seth, S.M., Hydraulics and Fluid Mechanics, Standard Book House,

AM371 OPEN CHANNEL FLOW AND SEDIMENT TRANSPORT

(3-0-0) 3 PREREQ: AM250

Steady GVF, SVF, RVF. Unsteady flow: basic equations, velocity of flood wave discharge, flood routing. Bulk properties of sediments, various related theories such as competent velocity concepts, lift concept, critical tractive force concept, Shield's analysis, regimes of flow, bed forms, resistance to flow, bed and suspended load transport, reservoir sedimentation, agredation and degradation of rivers, local scour, sediment samplers.

Subramanya. K, Open channel flow, Tata McGraw Hill, 3rd Edition, 2010. Graf, W. H.

Hydraulics of sediment transport, McGraw Hill, 1984.

Garde and Rangaraju, Sediment transport, Wiley Eastern, 2nd Edition, 1985 Chow, V.

T. open channel flow

AM372 CIVIL ENGINEERING SYSTEMS

(3-0-0) 3

Introduction to systems approach, simple and complex system, unique features of complex system. Unconstrained optimization, concave & convex functions, constrained optimization - KT conditions, Lagrangian multiplier method. Introduction to LP, Simplex method, Two phase method, Duality in LP, Introduction to DP, Network model, Allocation model. Some typical case studies.

Rao. S.S., Engineering Optimization, Wiley-IEEE, 3rd Edition, 1996.

Taha, H.A, Operation Research, Prentice Hall, 6th Edition, 1997.

Panik M. .J., Classical optimization foundation, North Holland Pub. Co., 1976.

AM380 MINI PROJECT – I

(0-0-3) 2

Experimental work either in the field or in the laboratory or design tasks of relatively smaller magnitude compared to Major Project work and in line with the guidelines formulated by the DUGC (AM).

AM381 MINI PROJECT – II

(0-0-3) 2

Experimental work either in the field or in the laboratory or design tasks of relatively smaller magnitude compared to Major Project work and in line with the guidelines formulated by the DUGC (AM).

AM400 GEOGRAPHIC INFORMATION SYSTEMS

(3-0-0) 3

Components of GIS, functions, Coordinate Systems, Raster and vector-based GIS and data structures, Spatial data sources Geo-relational Vector data model, Object based vector data model, raster data model, data input, geometric Transformation, Spatial data editing, Attribute data input and management, vector data analysis, Raster data analysis., Applications of GIS in several domains

Kang-tsung Chang, Introduction to Geographic Information Systems, 4th edition Tata McGraw Hill Burrough & McDonnell, Principles of Geographical Information Systems, Oxford University Press

Yang, Snyder & Tobler, Map projection Transformation principles and applications, Taylor and Francis

AM401 SATELLITE DIGITAL IMAGE ANALYSIS

(3-0-0) 3

Introduction to Remote sensing and Digital image Processing, Remote sensing data collection Alternatives, Hardware and software issues, Image Quality assessment, Electromagnetic Energy Radiation Principles and radiometric correction, Geometric correction, Image Enhancement, Pattern Recognition, Information extraction from MSS and Hyperspectral data, Change detection studies.

Jensen J.R Remote Sensing of the Environment An Earth Resource Perspective Second Edition, Dorling Kindersley

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

India Pvt Ltd.

Jensen J.R Introduction to Digital Image Processing: A remote sensing Perspective. Prentice- Hall,2005. Lillesand, T.M., R.W. Kiefer, and J.W. Chipman. Remote Sensing and Image Interpretation. 5th Edition. John Wiley and Sons. 2004.

AM402 INTRODUCTION TO GEOSPATIAL TECHNOLOGIES AND APPLICATIONS (3-0-0)3

Introduction to Geographic Information Systems, spatial data sources and models, spatial data analysis and applications, GPS principles and applications, introduction to satellite remote sensing, sensors and resolution, image processing methods classification, accuracy assessment in GIS and GPS, change detection; applications of GIS, remote sensing and GPS in resources management, environmental monitoring, optimal site selection, rural and urban development.

Chang K., Introduction to Geographic Information Systems, 8th Edition, McGraw-Hill, New York, 2006.

Hofman-Wellenhof. B., Wein. Global Positioning System: theory and practice, Springer 2001

Lillesand, T. and Kiefer, R.W., Remote Sensing and Image Interpretation, 5th edn., 2004

Richards, J.A. and Jia, X., Remote Sensing Digital Image Analysis, 4th ed., Springer, 2006.

AM403 GLOBAL POSITIONING SYSTEMS (3-0-0) 3

Introduction to GPS, GPS details, GPS Errors and Biases , Datum, Coordinate Systems and Map Projections , GPS Positioning Modes, Ambiguity-Resolution Techniques, GPS Data and Correction Services,GPS standard Formats, GPS integration, GPS applications, Other Satellite Navigation Systems *Ahmed El- Rabbany " Introduction to GPS" Artech House Rao,*

K.N. R Fundamentals of Satellite Communications PHI, 2004

AM421 DESIGN & DRAWING OF HYDRAULIC STRUCTURES (1-0-3) 3 PREREQ: AM 300

Introduction to Lacey's regime theory, Khosla's theory, Bligh's creep theory, Hydraulic design and drawing of following structures: i. Earthen dam; ii. Gravity dam (OS); iii. Gravity dam (NOS); iv. Surplus weir; v. Canal drop; vi. Canal regulator; vii. Tank sluice with tower head; viii. Direct sluice; ix. Aqueduct.

Punmia,BC and Lal,PBB. Irrigation& Water Power Engineering, Standard Book House, 2ndEdition,1990.

Michel, WH. Manual of Irrigation Engineering, Hubbard Press,1997.

C.S. Murthy, Water Resources Engineering:Principles and Practices, New Age International,1997.

AM422 FUNDAMENTALS OF COASTAL ENGINEERING (3-0-0) 3 PREREQ : AM250

Basic Wave Hydrodynamics, Linear Wave Theory, Wave Phenomena,Generation of Wind Waves, Wave Spectrum, Wave Forecasting, Basics of Wave Structure Interaction, Coastal Processes - Littoral Drift, Coastal Erosion and Protection (Hard and Soft Options), Design Principles of Breakwaters.

Shore Protection Manual, U.S.Army Corps of Engineers, Coastal Engineering Research Center,1984. US Army Corps of Engineers, 'Shore protection manual(SPM)", Vol. 1 &2, Coastal Engg Res. Centre, US Govt. Printing Office , Washington D.C. USA, 1984.

US Army Corps of Engineers, 'Coastal Engg. Manual (CEM)", Parts 1 to 6, Coastal Engg Res. Centre, Washington D.C. USA., 2006.

Ippen A.T., Estuary & Coastline Hydrodynamics, McGraw Hill, New York, USA, 1996.

AM423 BASICS OF OFFSHORE ENGINEERING (3-0-0) 3 PREREQ: AM 250

Ocean Waves, Currents, Winds, Ice and Mud loading, Basics of Offshore Structures - Jacket, Tower, Gravity platforms, Hybrid Structures and factors governing their selection, Linear wave theory, Morison equation. Linear dynamic analysis, Pile foundations, Bearings capacity of footings, Corrosion and under water Welding.

US Army Corps of Engineers, 'Shore protection manual(SPM)", Vol. 1& 2, Coastal Engg Res. Centre, US Govt Printing Office , Washington D.C. USA., 1984.

US Army Corps of Engineers, 'Coastal Engg. Manual (CEM)", Parts 1 to 6, Coastal Engg Res. Centre, Washington D.C.,USA, 2006.

Weigel R.L.,Recommended practice for Planning, Designing, & Construction of Fixed Offshore Structures - Oceanographical Engg., Prentice Hall, 1969.

Pilarczyk K. W. and Zeidler R. B., "Offshore breakwaters and Shoreline Evolution Control", A. A. Balkema Publishers, Rotterdam, The Netherlands,1996.