National institute of technology, Tiruchirappalli - 620 015, Tamil Nadu, India

Temporary faculty selection- shortlisted candidates for written test and interview schedule

Instructions to the candidates

The shortlisted candidates for the written test for Temporary Faculty position is put up in the NIT website www.nitt.edu

The written test for the shortlisted candidates is scheduled on **19.02.2014(Wednesday).** The duration of the test will be for **one hour from 09.30 a.m. to 10.30 a.m. on 19.02.2014** at **IT Center (Computer Science Building), NIT, Tiruchirappalli.** The candidates are requested to be present in the test venue half-an-hour before written test i.e.by 09.00 a.m. on **19.02.2014**. The candidates are requested to produce a valid Photo ID proof and also requested to submit one set of photo copies of consolidated mark sheets (both UG and PG), GATE score card/SLET/NET(if any) , community certificate and filled copy of **data sheet(given in the page no 15)** at the time of written test. The syllabus for the written test of the concerned department is available from page no 6-14.

After the written test, the candidates will be shortlisted and then they will be called for interview. All the shortlisted candidates for the interview have to appear before a selection committee and also have to give a presentation on any topic of their interest (no power point presentation) to test their communication skills. The shortlisted candidates for oral presentation and interview will be displayed in test venue itself, department wise, by **11.00 a.m. onwards on 19.02.2014.**

The interview will be held at **Oom Room(next to Director's Office), Administrative building NIT, Tiruchirappalli, Tamilnadu.** The oral presentation and interview will be held as per the following schedule.

S.NO	DEPARTMENT	DATE	TIME
1.	Humanities (Economics)	19-02-2014 (Wednesday)	11.30 a.m.
2.	Architecture		2.00 p.m.
3.	Civil Engg.		2.30 p.m.
4.	Metallurgical & Materials Engg.	20-02-2014 (Thursday)	9.00 a.m.
5.	Electrical & Electronics Engg.		10.00 a.m.
6.	CEESAT	21-02-2014 (Friday)	9.00 a.m.
7.	Chemical Engg.		2.00 p.m.
8.	Management Studies	22-02-2014 (Saturday)	9.00 a.m.
9.	Chemistry		2.00 p.m.
10.	Computer Science & Engg.	23-02-2014 (Sunday)	9.00 a.m.
11.	Mechanical Engg.	24-02-2014 (Monday)	9.00 a.m.
12.	Production Engg.		11.00 a.m.
13.	Physics		2.00 p.m.

Additional information for the candidates:-

1. Kindly refer the application number in the short listed candidates list (given beside your name) to the written test for seating arrangements.
2. Report to the venue of written test/interview half an hour before the scheduled time.
3. Bring one set of attested copies of relevant documents such as educational qualification, experience certificates, community certificate, etc. You are also required to bring all the original documents for verification purpose.
4. Bring at least one of the following documents as proof of identity
   i. Valid passport
   ii. Voter identify card
   iii. PAN Card
   iv. Driving License
   v. Govt. or PSU undertaking issued valid photo identity cards.
   vi. Aadhar card
   vii. Any other valid Identity card
5. Venue for the interview:---

Oom ROOM(NEXT TO DIRECTOR'S OFFICE),
ADMINISTRATIVE BUILDING
NIT, TIRUCHIRAPPALLI, TAMILNADU-620015.

Please note the following:

1. No TA/DA will be paid for attending the written test and interview.
2. The request for change of date will not be entertained.
3. The invitation is a mere request to appear for written test/interview and does not assure that he/she will be recommended or selected.
4. The decision of the selection committee of the institute is final.

Encl: 1. Instructions : Page No-1
2. List of candidates called for written test : Page No-2-5
3. Syllabus for written test for concern Department : Page No-6-14
4. Data sheet : Page No-15

List of Candidates Short Listed For written test

DEPARTMENT OF ARCHITECTURE

S.No	Application No.	NAME
1	TF/14/ARC/001	R.Jaikumar
2	TF/14/ARC/002	Saptarshi kolay
3	TF/14/ARC/003	R.Iswarya
4	TF/14/ARC/004	Kshetrimayum Bangkim Singh

DEPARTMENT OF CENTRE FOR ENERGY & ENVIRONMENTAL SCIENCE AND TECHNOLOGY (CEESAT)

S.No	Application No.	NAME
1	TF/14/CEESAT/001	Anjali viswakumar
2	TF/14/CEESAT/002	Haritha meruvu
3	TF/14/CEESAT/004	P.Selvakumaran
4	TF/14/CEESAT/005	S.Lakshmipriya
5	TF/14/CEESAT/007	Anil K mathew
6	TF/14/CEESAT/009	N.Kalaiselvan
7	TF/14/CEESAT/011	Gopi kumar.s
8	TF/14/CEESAT/013	T.Vasugi
9	TF/14/CEESAT/014	Krupa.D
10	TF/14/CEESAT/016	S.Sujithra
11	TF/14/CEESAT/018	Priya Gandhi
12	TF/14/CEESAT/021	D.Sakthivadivel
13	TF/14/CEESAT/022	Jenifer.p.s
14	TF/14/CEESAT/023	R.Agnesgranabh
15	TF/14/CEESAT/024	M.Nagaraja
16	TF/14/CEESAT/025	S.Ivo Romauld
17	TF/14/CEESAT/026	Shanthi G
18	TF/14/CEESAT/028	P.Suresh Babu
19	TF/14/CEESAT/030	Sathya.T
20	TF/14/CEESAT/032	Dhivya Roselin.J
21	TF/14/CEESAT/033	Ratnadip Shankar Waghmare
22	TF/14/CEESAT/034	M.Jerold
23	TF/14/CEESAT/035	R.Samuel Devadoss
24	TF/14/CEESAT/038	Jothi.N
25	TF/14/CEESAT/039	Jomon Sebastian
26	TF/14/CEESAT/041	Dinesh Kumar.S

DEPARTMENT OF CHEMICAL ENGINEERING

S.No	Application No.	NAME
1	TF/14/CHL/001	Arijit mondal
2	TF/14/CHL/002	S. Senthil Kumar
3	TF/14/CHL/003	V.Subbaramaiah
4	TF/14/CHL/004	Amaresh Reddy Yedla
5	TF/14/CHL/005	Srinath.A
6	TF/14/CHL/007	R.Boopathy
7	TF/14/CHL/008	Dharmendra Kumar Bal
8	TF/14/CHL/009	Anand Babu Desamala
9	TF/14/CHL/010	Prasanna Rani Redapangu
10	TF/14/CHL/011	A.Subathira
11	TF/14/CHL/012	P.Asaithambi
12	TF/14/CHL/014	S.Niju
13	TF/14/CHL/015	S.Suresh Kumar
14	TF/14/CHL/017	Santhi Raju Pillai
15	TF/14/CHL/018	K.Sureshvarr
16	TF/14/CHL/020	Alagarsamy.S
17	TF/14/CHL/023	Yennam Rajesh
18	TF/14/CHL/028	Srinivas Tadepalli

DEPARTMENT OF CHEMISTRY

S.No	Application No.	NAME
1	TF/14/CHY/002	Dr.P.Uma Maheswari
2	TF/14/CHY/003	Santhoskumar A.U
3	TF/14/CHY/004	Dr.Madhusmita Behera
4	TF/14/CHY/005	Dr.S.Nagarajan
5	TF/14/CHY/006	K.Karuppasamy @ Sivakumar
6	TF/14/CHY/008	Ramya.A
7	TF/14/CHY/009	Saravana Kumar
8	TF/14/CHY/010	Karthikeyan.S
9	TF/14/CHY/011	M.Usharani
10	TF/14/CHY/012	Priyanka Pandey
11	TF/14/CHY/013	A.Antony Muthu Prabhu
12	TF/14/CHY/014	P.Duraippandi
13	TF/14/CHY/015	S.V.Karthikeyan
14	TF/14/CHY/016	G.Saraswathi
15	TF/14/CHY/017	V.Vimala
16	TF/14/CHY/018	Rajajeyaganthan Ramanathan
17	TF/14/CHY/019	Sivasakthi.M
18	TF/14/CHY/020	Thirumoorthi Ramalingam
19	TF/14/CHY/021	G.Subramaniyan
20	TF/14/CHY/022	Ananda Rama Krishnan
21	TF/14/CHY/025	P.Gomathi Sankar
22	TF/14/CHY/026	Dr.S.Chandra Leka
23	TF/14/CHY/027	Akila.E
24	TF/14/CHY/028	M.Ramalakshmi
25	TF/14/CHY/029	P.Vairaprakash
26	TF/14/CHY/030	E.Poonguzhali
27	TF/14/CHY/031	Satheesh.D

DEPARTMENT OF CIVIL ENGINEERING

S.No	Application No.	NAME
1	TF/14/CIVIL/001	Bilal .B
2	TF/14/CIVIL/005	Dr.M.Thayapraba
3	TF/14/CIVIL/007	Nidheesh P.V
4	TF/14/CIVIL/009	S.Vinoth
5	TF/14/CIVIL/010	Surendar N
6	TF/14/CIVIL/014	R.Vijaya Sarathy
7	TF/14/CIVIL/016	Remya Retnan
8	TF/14/CIVIL/018	Parthiban P
9	TF/14/CIVIL/021	Jegan Bharath Kumar.A
10	TF/14/CIVIL/022	R.Samuel Devadoss
11	TF/14/CIVIL/023	Nancy priya.S
12	TF/14/CIVIL/024	Saranya C
13	TF/14/CIVIL/025	Kiruthika M

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (CSE)

S.No	Application No.	NAME
1	TF/14/CSE/002	Thatiparthy. Bharath Kumar
2	TF/14/CSE/003	Sophia
3	TF/14/CSE/004	R. Gopi
4	TF/14/CSE/010	S. Pavaimalar
5	TF/14/CSE/011	C. Shankar
6	TF/14/CSE/013	Akash
7	TF/14/CSE/014	M. Gayathridevi
8	TF/14/CSE/015	R. Margaret Flora
9	TF/14/CSE/017	R. Ezilarasi
10	TF/14/CSE/018	J. Devi Dayal Vinayakhi
11	TF/14/CSE/020	S. Rajasekar
12	TF/14/CSE/022	T. Sahila
13	TF/14/CSE/023	R.L. Reckha
14	TF/14/CSE/024	M. Sakthivel
15	TF/14/CSE/025	S. Pragadeeswaran
16	TF/14/CSE/026	A. Midhun Kumar
17	TF/14/CSE/027	S. Priya
18	TF/14/CSE/028	N. Sathiya Priya
19	TF/14/CSE/029	M. Vivekananda Bharathi
20	TF/14/CSE/032	K. Premavathy
21	TF/14/CSE/033	S. Thavamaniyan
22	TF/14/CSE/034	S. Renuka
23	TF/14/CSE/035	S. Antony Dalya
24	TF/14/CSE/040	C. Dhivya
25	TF/14/CSE/042	P. Golda Jude
26	TF/14/CSE/045	M. Ambika
27	TF/14/CSE/046	R. Bharkkavi
28	TF/14/CSE/047	E. Ram Kumar
29	TF/14/CSE/050	Angala Manimuthu
30	TF/14/CSE/051	P. Mahendran
31	TF/14/CSE/053	S. Kavitha
32	TF/14/CSE/054	C. Madula
33	TF/14/CSE/055	S. Subramani
34	TF/14/CSE/056	P. Rengasamy
35	TF/14/CSE/058	S. Nandhakumar
36	TF/14/CSE/059	E. Kanimozhi
37	TF/14/CSE/060	E. Murugaboopathy
38	TF/14/CSE/061	S. Arul Raj
39	TF/14/CSE/062	S. Sivapradha
40	TF/14/CSE/064	R. Keerthana
41	TF/14/CSE/065	S. Asha
42	TF/14/CSE/066	M. Deepa Rani
43	TF/14/CSE/068	P. Lakshmi Priya
44	TF/14/CSE/070	P. Sudha
45	TF/14/CSE/071	D. Kavitha
46	TF/14/CSE/073	N. Nathia Saraswathi
47	TF/14/CSE/077	M. Nusarath Aiza
48	TF/14/CSE/079	T.K. Ramesh Babu
49	TF/14/CSE/080	N. Monika
50	TF/14/CSE/081	R. Sudha
51	TF/14/CSE/082	J. Praveen Kumar
52	TF/14/CSE/083	E. Durga
53	TF/14/CSE/086	I. Pon Arul
54	TF/14/CSE/088	C. Anoor Selvi
55	TF/14/CSE/090	J. Ranjitha
56	TF/14/CSE/092	M. Ganesan
57	TF/14/CSE/095	S. Jeba Anandh
58	TF/14/CSE/098	R. Bhuvani
59	TF/14/CSE/099	G. Mangayarkarasi
60	TF/14/CSE/100	V. Yuvaraj
61	TF/14/CSE/103	V. Vilva Naga Kani
62	TF/14/CSE/105	V. Ezhil Arasi
63	TF/14/CSE/107	B. Dhivakar
64	TF/14/CSE/108	A. Geethanjali
65	TF/14/CSE/110	K. Premnath

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING(EEE)

S.No	Application No.	NAME
1	TF/14/EEE/001	K. Lenin
2	TF/14/EEE/002	P.M. Arumugapandi
3	TF/14/EEE/003	S. Sadaiappan
4	TF/14/EEE/004	V.J. Sivanagappa
5	TF/14/EEE/005	B. Gomathi
6	TF/14/EEE/007	Kalyan Aravalli
7	TF/14/EEE/008	R. Sivaganesh
8	TF/14/EEE/013	P. Saranya
9	TF/14/EEE/015	V. Vijayavagu
10	TF/14/EEE/016	P. Anitha
11	TF/14/EEE/019	D. Nalini
12	**TF/14/EEE/020**	S. Singaravel
13	TF/14/EEE/021	N. Ram Kumar
14	TF/14/EEE/022	D. Glory Rebekah Selvamani
15	TF/14/EEE/023	P. Vijayakumar
16	TF/14/EEE/024	K. Sekar
17	TF/14/EEE/025	M. Geetha Rani
18	TF/14/EEE/026	J. Vigneshbalaji
19	TF/14/EEE/027	R. Agasthiya
20	TF/14/EEE/033	J. Mohan
21	TF/14/EEE/034	N. Jayanthi
22	TF/14/EEE/036	P. Pavunraj
23	TF/14/EEE/038	V. Srividhya
24	TF/14/EEE/040	G.K. Muhil
25	TF/14/EEE/042	S. Raghavendran
26	TF/14/EEE/043	A. Karthikeyan
27	TF/14/EEE/044	S. Venma Devi
28	TF/14/EEE/045	K. Arunkumar
29	TF/14/EEE/046	T. Jeyamalathy
30	TF/14/EEE/049	A. Amrudeen
31	TF/14/EEE/051	N. Karthik
32	TF/14/EEE/052	M. Ezhill
33	TF/14/EEE/053	C. Nalini Kiran
34	TF/14/EEE/056	K. Sivakumar
35	TF/14/EEE/057	S. Kalaivanan
36	TF/14/EEE/058	V. Thamarai Selvi
37	TF/14/EEE/064	B. Indhuja
38	TF/14/EEE/066	A. Ronald Marian
39	TF/14/EEE/068	A. Reena
40	TF/14/EEE/072	B. Prakash Ayyappan
41	TF/14/EEE/075	S. Pappian
42	TF/14/EEE/076	J.C. Paul Immanuel
43	TF/14/EEE/080	G. Deivamani

DEPARTMENT OF HUMANITIES (ECONOMICS)

S.No	Application No.	NAME
1	TF/14/ECO/001	S.Rajakumar
2	TF/14/ECO/002	M.Boorasamy
3	TF/14/ECO/003	Navin Kumar Rajpal
4	TF/14/ECO/004	Pesala Busenna
5	TF/14/ECO/005	Dr.Kannabiran.M
6	TF/14/ECO/006	S.Vigneswaran
7	TF/14/ECO/007	Muthumurugan
8	TF/14/ECO/008	A.Alexander
9	TF/14/ECO/009	Prakash.T
10	TF/14/ECO/010	P.Jayakumar
11	TF/14/ECO/011	A.Selvakumar
12	TF/14/ECO/012	P.Rajasimman
13	TF/14/ECO/013	Gautam Kumar Sinha
14	TF/14/ECO/014	U.Anitha

DEPARTMENT OF MANAGEMENT STUDIES

S.No	Application No.	NAME
1	TF/14/MBA/001	Deepti Ranjan Sahoo
2	TF/14/MBA/002	N.Senthil Kumar
3	TF/14/MBA/004	B.Balaji Sathya Narayanan
4	TF/14/MBA/005	Jayan.R
5	TF/14/MBA/006	Nigama.K
6	TF/14/MBA/007	Aravindhan.A
7	TF/14/MBA/010	Bharath Kumar.T
8	TF/14/MBA/012	P.Lakshmi
9	TF/14/MBA/013	Ravi Shankar Bhakat
10	TF/14/MBA/014	Shivasangari.R
11	TF/14/MBA/015	P.Sundara Bala Murugan
12	TF/14/MBA/016	M.Prakash
13	TF/14/MBA/017	AV.Karthick
14	TF/14/MBA/018	Padmavathi.T
15	TF/14/MBA/019	S.N.Saranyaa
16	TF/14/MBA/025	R.Shabeethadevi
17	TF/14/MBA/027	S.Shankari
18	TF/14/MBA/029	S.Visalakshmi
19	TF/14/MBA/031	Syed Amjad Peeran.I
20	TF/14/MBA/034	J.Rajesh Khanna
21	TF/14/MBA/035	Srinivas.M
22	TF/14/MBA/036	P.M.Aswini
23	TF/14/MBA/038	V.Vidhyalakshmi
24	TF/14/MBA/039	B.Janarthanan
25	TF/14/MBA/041	K.K.Ravi Chandran
26	TF/14/MBA/043	Vaibhav Mishra
27	TF/14/MBA/044	H.Kalaiarasi

DEPARTMENT OF MECHANICAL ENGINEERING

S.No	Application No.	NAME
1	TF/14/Mech/001	K. Mohan Kumar
2	TF/14/Mech/002	J. Harish Kumar
3	TF/14/Mech/003	K. Saran Kumar
4	TF/14/Mech/004	Pagidi Madhukar
5	TF/14/Mech/005	Abhishek Kumar
6	TF/14/Mech/006	T. Arun Selva Kumar
7	TF/14/Mech/008	P. Anand Prabu
8	TF/14/Mech/009	Kamal Babu
9	TF/14/Mech/011	S. Mohanasundaram
10	TF/14/Mech/013	M. Jebaraj
11	TF/14/Mech/014	M. Mareeswaran
12	TF/14/Mech/015	S. Krishnaraj
13	TF/14/Mech/016	D.N. Graceson

DEPARTMENT OF METALLURGICAL AND MATERIALS ENGINEERING (MME)

S.No	Application No.	NAME
1	TF/14/MME/001	Neha Gupta
2	TF/14/MME/002	C.P. Suresh Kumar
3	TF/14/MME/003	T. Viswanathan
4	TF/14/MME/005	P. Susila
5	TF/14/MME/006	G. Gautham Prakash
6	TF/14/MME/008	J. Maya
7	TF/14/MME/011	Naveed Hussain

DEPARTMENT OF PHYSICS

S.No	Application No.	NAME
1	TF/14/PHY/001	Gagan Bihari Pradahan
2	TF/14/PHY/002	M.Suganthi
3	TF/14/PHY/003	Eithiraj R.D
4	TF/14/PHY/004	V.Sriranjani
5	TF/14/PHY/005	P.Michael Sahaya Lucy Shanthi
6	TF/14/PHY/006	A. Sinthiya
7	TF/14/PHY/007	T.K.Abilasha Ramadhas
8	TF/14/PHY/008	K.R.Vijayaraghavan
9	TF/14/PHY/009	Dr.M.Prabu
10	TF/14/PHY/010	P.Karthick Kannan
11	TF/14/PHY/011	D.Prakash
12	TF/14/PHY/012	M.Kalpana
13	TF/14/PHY/014	Mohan Radheep
14	TF/14/PHY/015	T.Prabhakaran
15	TF/14/PHY/016	S.Gowrishankar
16	TF/14/PHY/017	Vijay Narayan
17	TF/14/PHY/018	Dr.T.Pazhanivel
18	TF/14/PHY/019	Shinoj Vengalathunadakal Kuttinarayanan
19	TF/14/PHY/022	Ambikeswari.N
20	TF/14/PHY/023	S.Boomadevi
21	TF/14/PHY/024	Jayanthi.G
22	TF/14/PHY/025	Jasmine Mary.J
23	TF/14/PHY/026	M.Nandhagopal
24	TF/14/PHY/027	Dr.B.Sathyaseelan

DEPARTMENT OF PRODUCTION ENGINEERING

S.No	Application No.	NAME
1	TF/14/Pro/001	I. Arun Gandhi
2	TF/14/Pro/003	M. Vijayakumar
3	TF/14/Pro/004	Pagidi Madhukar
4	TF/14/Pro/005	P. Anand Prabu
5	TF/14/Pro/006	D. Mohan Kumar
6	TF/14/Pro/007	C. Velmurugan
7	TF/14/Pro/008	I. Arun
8	TF/14/Pro/009	M. Maniraj
9	TF/14/Pro/010	A. Ashok Kumar

SYLLABUS FOR WRITTEN TEST FOR SELECTION OF TEMPORARY FACULTY

DEPARTMENT OF ARCHITECTURE

Building Construction and Materials
Building Services (Water supply and Drainage, Lighting, Air-conditioning, Fire, Electrical and Mechanical Services)
History/ Contemporary Architecture
Energy Efficient/ Green Buildings
Urban Planning/ urban Design
Landscape Architecture
Professional Practice, Bye-laws and Construction Management

CENTRE FOR ENERGY & ENVIRONMENTAL SCIENCE AND TECHNOLOGY (CEESAT)

1. Heat Transfer.
2. Mass Transfer
3. Fluid Mechanics.
4. Thermal Engineering.
5. Wind Energy
6. Solar energy.
7. Air Pollution.
8. Water Pollution.
9. Basics of Mechanics
10. Basics of Electrical Engineering and Biotechnology.

DEPARTMENT OF CHEMICAL ENGINEERING

ENGINEERING MATHEMATICS

Linear Algebra: Matrix algebra, Systems of linear equations, Eigen values and eigenvectors.

Calculus*:* Functions of single variable, Limit, continuity and differentiability, Mean value theorems, Evaluation of definite and improper integrals, Partial derivatives, Total derivative, Maxima and minima, Gradient, Divergence and Curl, Vector identities, Directional derivatives, Line, Surface and Volume integrals, Stokes, Gauss and Green's theorems.

Differential equations: First order equations (linear and nonlinear), Higher order linear differential equations with constant coefficients, Cauchy's and Euler's equations, Initial and boundary value problems, Laplace transforms, Solutions of one dimensional heat and wave equations and Laplace equation.

Complex variables: Analytic functions, Cauchy's integral theorem, Taylor and Laurent series, Residue theorem.

Probability and Statistics: Definitions of probability and sampling theorems, Conditional probability, Mean, median, mode and standard deviation, Random variables, Poisson, Normal and Binomial distributions.

Numerical Methods: Numerical solutions of linear and non-linear algebraic equations Integration by trapezoidal and Simpson's rule, single and multi-step methods for differential equations.

CHEMICAL ENGINEERING

Process Calculations and Thermodynamics: Laws of conservation of mass and energy; use of tie components; recycle, bypass and purge calculations; degree of freedom analysis. First and Second laws of thermodynamics. First law application to close and open systems. Second law and Entropy. Thermodynamic properties of pure substances: equation of state and departure function, properties of mixtures: partial molar properties, fugacity, excess properties and activity coefficients; phase equilibria: predicting VLE of systems; chemical reaction equilibria.

Fluid Mechanics and Mechanical Operations: Fluid statics, Newtonian and non-Newtonian fluids, Bernoulli equation, Macroscopic friction factors, energy balance, dimensional analysis, shell balances, flow through pipeline systems, flow meters, pumps and compressors, packed and fluidized beds, elementary boundary layer

theory, size reduction and size separation; free and hindered settling; centrifuge and cyclones; thickening and classification, filtration, mixing and agitation; conveying of solids.

Heat Transfer: Conduction, convection and radiation, heat transfer coefficients, steady and unsteady heat conduction, boiling, condensation and evaporation; types of heat exchangers and evaporators and their design.

Mass Transfer: Fick's laws, molecular diffusion in fluids, mass transfer coefficients, film, penetration and surface renewal theories; momentum, heat and mass transfer analogies; stagewise and continuous contacting and stage efficiencies; HTU & NTU concepts design and operation of equipment for distillation, absorption, leaching, liquid-liquid extraction, drying, humidification, dehumidification and adsorption.

Chemical Reaction Engineering: Theories of reaction rates; kinetics of homogeneous reactions, interpretation of kinetic data, single and multiple reactions in ideal reactors, non-ideal reactors; residence time distribution, single parameter model; non-isothermal reactors; kinetics of heterogeneous catalytic reactions; diffusion effects in catalysis.

Instrumentation and Process Control: Measurement of process variables; sensors, transducers and their dynamics, transfer functions and dynamic responses of simple systems, process reaction curve, controller modes (P, PI, and PID); control valves; analysis of closed loop systems including stability, frequency response and controller tuning, cascade, feed forward control.

Plant Design and Economics: Process design and sizing of chemical engineering equipment such as compressors, heat exchangers, multistage contactors; principles of process economics and cost estimation including total annualized cost, cost indexes, rate of return, payback period, discounted cash flow, optimization in design.

Chemical Technology: Inorganic chemical industries; sulfuric acid, NaOH, fertilizers (Ammonia, Urea, SSP and TSP); natural products industries (Pulp and Paper, Sugar, Oil, and Fats); petroleum refining and petrochemicals; polymerization industries; polyethylene, polypropylene, PVC and polyester synthetic fibers.

DEPARTMENT OF CHEMISTRY

Organic Chemistry

Reaction mechanism: Definition of reaction mechanism, transition state theory, kinetics, qualitative picture. Substituent effects, linear free energy relationships, Hammett equation and related modifications. Basic mechanistic concepts like kinetic *vs* thermodynamic control, Hammond postulate, Curtin-Hammett principle, isotope effects, general and specific acid-base catalysis, and nucleophilic catalysis.

Nucleophilic substitution: Reactivity, structural and solvent effects, substitution in S_N1, S_N2, S_Ni. Neighbouring group participation -Norbornyl and bridgehead systems, substitution at allylic and vinylic carbons, substitution by ambident nucleophiles, aromatic nucleophilic substitution, S_NAr, benzyne, S_N1. Aromatic nucleophilic substitution of activated halides

Addition to carbon-carbon multiple bonds: Electrophilic, nucleophilic and free radical addition. Stereochemistry and orientation of the addition.Hydrogenation, halogenation, hydroxylation, hydroboration. Addition to carbonyl compounds - 1,2 and 1,4-addition, benzoin, Knoevenegal, Stobbe and Darzenglycidic ester reactions.

Elimination reactions: E1, E2, E1CB- mechanism, stereochemistry, orientation of double bonds - Hoffmann, Zaitsev, Bredts rule - pyrolytic elimination, Chugaev reaction. Oxidation and reduction: Reduction using hydride reagents, $LiAlH_4$, $NABH_4$ and other organoboranes: chemo- and stereoselectivity, catalytic hydrogenation (homogenous and heterogeneous catalysts), Swern and Dess-Martin oxidations, Corey-Kim oxidation, PCC, $KMnO_4$ oxidations.

Theories of aromaticity: Aromaticity, antiaromaticity, Huckel's rule, annulences and heteroannulenes, fullerenes (C60). Other conjugated systems, Chichibabin reaction. Aromatic electrophilic substitution: Orientation, reactivity, and mechanisms. Substitution in thiophene and pyridine. Reactive intermediates - carbenes, nitrenes, radicals, Ylides - Formation, stability and their applications.

Fundamentals of photochemistry: Qualitative introduction about different transitions, cis-trans isomerization, Paterno-Buchi reaction, Norrish type I and II reactions, photo reduction of ketones, photochemistry of arenes, di-pi-methane and Hoffmann-Loeffler-Freytag rearrangements.

Pericyclic reactions: Classification, electrocyclic, sigmatropic, cycloaddition and ene reactions, Woodward-Hoffmann rules, and FMO theory, Claisen, Cope, Sommelet-Hauser, and Diels-Alder reactions in synthesis, stereochemical aspects.

Optical activity and chirality: absolute and relative configuration - R-S notation system, molecules with more than one asymmetric center. Enantiotopic and diastereotopic atoms, groups and faces.Stereo specific and stereo selective synthesis, optical isomerism of biphenyls, allenes and spiranes.Compounds containing chiral nitrogen and sulfur.Geometrical isomerism, E, Z- nomenclature of olefins, cumulenes and oximes.

Conformational analysis: Fischer projection, inter-conversion of Sawhorse, Newman and Fischer projections, conformational analysis of ethane and disubstituted ethane derivatives, cycloalkanes and substituted cyclohexane. Conformation and stereochemistry of cis and transdecalin and 9-methyldecalin. Anomeric effect in cyclic compounds.

Rearrangementreactions: involving electron deficient, carbon, nitrogen, oxygen centers, emphasis on synthetic utility of these rearrangements. Baker–Venkataraman, benzilic acid, [1,2]-Meisenheimer, [2,3]-Meisenheimer, Wagner-Meerwein, Pinacol, Demyanov, Dienone-Phenol, Favorskii, Wolff, Hofmann, Curtius, Lossen, Schmidt, Beckmann, Benzidine, Hofmann-Loffler rearrangements.

Introduction to retrosynthesis: Synthon, synthetic equivalent, target molecule, functional group interconversion, disconnection approach, importance of the order of events in organic synthesis. Chemoselectivity, one group C-C and C-X disconnection (disconnection of alcohols, alkenes, and carbonyl compounds).

Two group C-C & C-X disconnections: 1,3 and 1,5 difunctionalised compounds, α,β-unsaturated carbonyl compounds, control in carbonyl condensation, synthesis of 3,4,5 and 6 membered rings in organic synthesis. Diels- Alder reaction, connection in retro synthesis.

Protecting groups: Protection of hydroxyl, carboxyl, carbonyl, amino groups.Umpolung reagents, definition of umpolung, acyl anion equivalent, protection of carbon-carbon multiple bonds.Illustration of protection and deprotection in synthesis.

Reagents in organic synthesis: Functional group transformation, complex metal hydrides, Gilman's reagent, lithium diisoproplyamide (LDA), dicyclohexylcarbodimide, timethylsilyl iodide, Woodward and Provost hydroxylation, osmium tetraoxide, DDQ, SeO_2, lead tetraacetate, H_2O_2,phase transfer catalyst, crown ethers and Merrifield resin, Wilkinson's catalyst, Baker yeast.

Name reactions in organic synthesis: Peterson olefination, McMurry, Shapiro reaction, Wittig and its modifications, palladium based reactions - Suzuki, Heck, Sonagashira, Hiyama, Stille, Glazer-Eglington coupling, Sharplessepoxidation, Henry reaction, Michael addition, aldol, Claisen, Dieckman condensations, Barton, Baylis Hillman reaction, Stork enamine reaction and selective mono and di alkylation *via*enamines.

Inorganic Chemistry

Theories of coordination compounds - VB theory - CFT - splitting of d orbitals in ligand fields and different symmetries - CFSE - factors affecting the magnitude of 10 Dq - evidence for crystal field stabilization - spectrochemical series - site selection in spinels - tetragonal distortion from octahedral symmetry - Jahn-Teller distortion - Nephelauxetic effect - MO theory - octahedral - tetrahedral and square planar complexes - p-bonding and molecular orbital theory - experimental evidence for p-bonding.

Reactions: Substitution reactions in square planar complexes - the rate law for nucleophilic substitution in a square planar complex - the trans effect - theories of trans effect - mechanism of nucleophilic substitution in square planar complexes - kinetics of octahedral substitution - ligand field effects and reaction rates - mechanism of substitution in octahedral complexes - reaction rates influenced by acid and bases - racemization and isomerization - mechanisms of redox reactions - outer sphere mechanisms - excited state outer sphere electron transfer reactions - inner sphere mechanisms - mixed valent complexes.

Electronic spectra and magnetism: Microstates, terms and energy levels for $d^1 – d^9$ ions in cubic and square fields - selection rules - band intensities and band widths - Orgel and Tanabe-Sugano diagrams - evaluation of

10 Dq and β for octahedral complexes of cobalt and nickel - charge transfer spectra - magnetic properties of coordination compounds - change in magnetic properties of complexes in terms of spin orbit coupling - temperature independent paramagnetism - spin cross over phenomena.

IR and Raman spectroscopy: Structural elucidation of simple molecules like N_2O, ClF_3, NO_3^-, ClO_4^- - effect of coordination on ligand vibrations - uses of group vibrations in the structural elucidation of metal complexes of urea, thiourea, cyanide, thiocyanate, nitrate, sulphate and DMSO - effect of isotopic substitution on the vibrational spectra of molecules - applications of Raman spectroscopy

Structure: Structure of coordination compounds with reference to the existence of various coordination numbers (2, 3, 4, 5 & 6) - site preferences - isomerism - trigonal prism - absolute configuration of complexes - stereo selectivity and conformation of chelate rings - coordination number seven and eight. Spectral and magnetic properties of lanthanide and actinide complexes.

Structure and bonding in organometallics: 18/16-electron rule - metal carbonyls – bonding – spectra – nitrosyls - dinitrogen complexes – phosphines - metal alkyls, aryls, hydrides and dihydrogen complexes - π-bonding ligands – metallocenes - electronic structure and bonding in ferrocene - synthesis, physical and spectroscopic properties of metallocenes - fluxional molecules.

Reaction mechanism and catalysis: Ligand substitution - oxidative addition and reductive elimination - 1,1 and 1,2-insertion - addition and elimination reactions - alkene isomerization- hydroboration - hydrocyanation - hydrogenation of olefins - Wilkinson's catalyst - hydroformylation of olefins - Wacker-Smidt synthesis - Monsanto acetic acid process -Eastman Halcon process - Fischer-Tropsch process - hydrosilylation.

Carbenes: Fischer and Schrock carbenes - bonding & reactivity - Grubbs catalyst - carbynes structure, synthesis and reactions- alkene metathesis – mechanism - RCM-ROMP, SHOP and ADMET - C-H and C-C activation - agostic bonds - Ziegler-Natta polymerization of olefins - Heck reaction - The PausonKhand reaction - Ene reaction.

Transport of metal ions: Uptake, transport and storage of metal ions by organisms - structure and functions of biological membranes - the generation of concentration gradients (the Na^+-K^+ pump) - mechanisms of ion-transport across cell membranes – bleomycin - siderophores (e.g. enterobactin and desferrioxamine) - transport of iron by transferring - storage of iron by ferritin - bio chemistry of calcium as hormonal messenger.

Metalloporphyrins/Metalloenzymes: Dioxygen transport and storage - hemoglobin and myoglobin: electronic and spatial structures - hemeythrin and hemocyanine - synthetic oxygen carriers, model systems - blue copper proteins (Cu) - iron-sulfur proteins (Fe)- cytrochromes electron transport chain - carbon monoxide poisoning - iron enzymes - peroxidase, catalase and cytochrome P-450, copper enzymes - superoxide dismutase, vitamin B12 and B12 coenzymes, photosynthesis - photosystem-I & II, nitrogen fixation, cisplatin.

Fundamentals: Types of solids - close packing of atoms and ions - bcc , fcc and hep voids - Goldschmidt radius ratio - derivation - its influence on structures - structures of rock salt - cesium chloride - wurtzite - zinc blende - rutile - fluroite - antifluorite - diamond and graphite - spinel - normal and inverse spinels and perovskite - lattice energy of ionic crystals - Madelung constant - Born-Haber cycle and its applications.

Theories: Band theory of solids. Free electron Theory, zone theory, MO theory of solids -dislocation in solids: Schottky and Frenkel defects. Line defects and plane defects – non -stoichiometric compounds. Electrical properties: Energy bands, insulators, semiconductors and conductors - super conductors - dielectric properties, piezo-electricity, ferro electricity -conductivity in pure metals. Superconductivity: Occurrence, BCS theory, high temperature super conductors - introduction to nanoparticles - metal nanoparticles - particle size determination.

X- Ray diffraction: Theory- the crystal systems and Bravais lattices - Miller indices and labelling of planes - symmetry properties - crystallographic point groups and space groups - X-ray diffraction - powder and rotating crystal methods - systematic absences and determination of lattice types - analysis of X-ray data for cubic system - structure factor and Fourier synthesis - Fundamentals of electron and neutron diffraction.

Nuclear structure: Mass and charge, nuclear moments, binding energy, mass defect, packing fraction, stability, magic numbers. Modes of radioactive decay and rate of radioactive decay - half-life, average life, radioactive equilibrium: Transient and secular -nuclear reactions: Energetics and types - nuclear fission- liquid

drop model - nuclear fusion - essential features of nuclear reactors - tracer techniques, neutron activation analysis - carbon and rock dating - application of tracers in chemical analysis, reaction mechanisms, medicine and industry.

Inorganic rings and polymers: Catenation, heterocatenation, intercalation chemistry, one dimensional conductor, polymeric sulfur nitride - Preparation, properties - isopoly anions - heteropoly anions - borazines - phosphazenes - phosphazene polymers - ring compounds of sulphur and nitrogen. Interhalogen compounds - oxoacids of selenium and tellurium. Noble gas chemistry and their halides and pseudohalides.

Physical Chemistry

Quantum chemistry: The failures of classical physics – Black body radiation - photoelectric effect - Bhor's quantum theory, Wave particle duality - Uncertainty principle, Quantum mechanical postulates, Schrodinger equation and its solution to the problem of a particle in one and three dimensional boxes. Quantum mechanical results for a rigid rotator and simple harmonic oscillator, Schrodinger equation for hydrogen atom and its solution - Derivation of Eigen function and Eigen value for hydrogen atom. Term symbols for electronic state in atoms – LS and JJ coupling. The origin of electronic quantum numbers and physical significance - radial probability density - significance of magnetic quantum number with respect to angular momentum.Hydrogen molecule ion and hydrogen molecule - Pauli's exclusion principle.Born Oppenheimer approximation, Mulliken designation of molecular orbitals.MO theory of bonding, MO treatment of H-bonded systems, ethylene, butadiene and benzene. Approximation methods: Perturbation and variation method, wave functions for many electron atoms – Hartree-Fock SCF method, Slater orbitals.

Group theory: Elements of group theory, definition, group multiplication tables, conjugate classes, conjugate and normal subgroups, symmetry elements and operations, point groups, assignment of point groups to molecules, Matrix representation of geometric transformation and point group, reducible and irreducible representations, construction of character tables, bases for irreducible representation, direct product, symmetry adapted linear combinations, projection operators. Orthogonality theorem - its consequences. Symmetry aspects of molecular orbital theory, planar π-systems, symmetry factoring of Huckel determinants, solving it for energy and MOs for ethylene and 1,4-butadiene, sigma bonding in AX_n molecules, hybridization, tetrahedral, octahedral, square planner, trigonal planar, linear, trigonalbipyramidal systems, hybrid orbitals as linear combination of AOs, electronic spectra, selection rule, polarization electron dipole transition, electronic transitions in formaldehyde, butadiene, configuration interaction, vibrational spectra, symmetry types of normal molecules, symmetry coordinates, selection rules for fundamental vibrational transition, IR and Raman activity of fundamentals in CO_2, H_2O, N_2F_2, the rule of mutual exclusion and Fermi resonance.
Thermodynamics: Laws of thermodynamics, Nernst heat theorem and other forms of stating the third law. Thermodynamic quantities at absolute zero, apparent exceptions to the third law - thermodynamics of systems of variable composition, partial molar properties, chemical potential, relationship between partial molar quantities, Gibbs Duhem equation and its applications (the experimental determination of partial molar properties not included) - thermodynamic properties of real gases, fugacity concept, calculation of fugacity of real gas, activity and activity coefficient, concept, definition, standard states and experimental determinations of activity and activity coefficient of electrolytes.

Phase rule, colloids and micelles: Three component systems, representation by triangular diagrams, systems of three liquids, formation of one pair of partially miscible liquids, formation of two pairs of partially miscible liquids, solid, liquid phases, eutectic systems - colloids: Distinction between suspension, colloidal solutions and true solutions, lyophilc and lyophobic colloids, Tyndall effect, stability of colloids, coagulation, emulsions, various types. Micelles: Surfactant (amphipathic molecule), micellisation, critical micelle concentration, size of micelle, aggregation number, thermodynamics of micellization, solubilisation behavior of micelles, reverse micelles.

Electrochemistry: Ion transport in solution - migration, convention and diffusion -Fick's laws of diffusion conduction - influence of ionic atmosphere on the conductivity of electrolytes - The Debye Huckel-Onsager equation for the equivalent conductivity of electrolytes - experimental verification of the equation - conductivity at high field and at high frequency - conductivity of non aqueous solutions - effect of ion association on conductivity. The electrode-electrolyte interface - electrical double layer - electro capillary phenomena -Lippmann equation - the Helmholz - Perrin - Guoy - Chapmann and Stern models, electrokinetic phenomena Tiseiius method of separation of protons of proteins - membrane potential. Elecrodics - mechanism of electrode reactions - polarization and over potential - the Butler volmer equation for one step and multistep electron transfer reaction - significance of equilibrium exchange current density and symmetry factor -

significance of transfer coefficient - mechanism of the hydrogen evolution reaction and oxygen evolution reactions. Some electrochemical reactions of technological interest - corrosion and passivity of metals - construction and use of Pourbaix and Evans diagrams - methods of protection of metals from corrosion, fuel cells - electro deposition.

Chemical kinetics: Simultaneous reactions - opposing, parallel and consecutive reactions, the steady state approximation - theories of reaction rates - transition state theory and collision theory a comparison - enthalpy, entropy and free energy of activation, potential energy surfaces, reaction coordinates, kinetic isotope effects, factors determining reaction rates in solution, solvent dielectric constant and ionic strength. Chain reactions - linear reactions, branching chains - explosion limits; Rice–Herzfeld scheme; kinetics of free radical polymerization reactions. Enzyme catalysis - rates of enzyme catalysed reactions - effect of substrate concentration, pH and temperature - determination of Michael's parameters.

Statistical thermodynamics: Maxwel's law of distribution of molecular speeds, graphical representation, experimental verification - derivation of expressions for average, most probable and root mean square velocity. Concept of velocity space and phase space -perturbution and combination - laws of probability - microstates for distinguishable and indistinguishable particles. Derivation of Maxwell Boltzmann distribution law - partition functions and their calculation. Expressions for thermodynamic quantities in terms of partition functions - translational, rotational, vibrational and electronic contributions to the thermodynamic properties of perfect gases, Intermolecular forces in imperfect gases. Statistical interpretation of laws of thermodynamics, third law of thermodynamics and apparent expression to it. Quantum statistics: Limitation of classical statistics - quantum statistics and classical statistics, comparison - heat capacities of gases in general and hydrogen in particular - heat capacities of solids. Einstein and Debye models - Bose Einstein statistics and Fermi Dirac statistics and corresponding distribution functions - applications of quantum statistics to liquid helium, electrons in metal and Planck's radiation law.

Photochemistry: Absorption and emission of radiation, Franck Condon principle decay of electronically excited states, radiative and non-radiative processes, fluorescence and phosphorescence, spin-forbidden radiative transitions, inter conversion and intersystem crossing. Theory of energy transfer - resonance and exchange mechanism, triplet-triplet annihilation, photosensitization and quenching.Spontaneous and induced emissions.Einstein transition probability - inversion of population - laser and masers. Flash photolysis: Chemi and thermoluminescence.

Surface chemistry: Surface Phenomena, Gibbs adsorption isotherm, types of adsorption isotherms, solid-liquid interfaces, contact angle and wetting, solid-gas interface, physisorption and chemisorption, Freundlich, derivation of Langmuir and BET isotherms, surface area determination. Kinetics of surface reactions involving adsorbed species, Langmuir-Hinshelwood mechanism, Langmuir-Rideal mechanism, Rideal-Eley mechanism. Surface Films, Langmuir-Blodgett films, self assembled mono layers, collapse pressure, surface area and mechanism of heterogeneous catalysis, phase transfer catalysis. Chemical analysis of surfaces: Surface preparations - spectroscopic surface characterization methods, electron spectroscopy, ion scattering spectrometry, secondary ion scattering microscopy (SIMS) - Auger electron spectroscopy - instrumentation and application. Electron stimulated micro analysis, scanning probe microscopes.

DEPARTMENT OF CIVIL ENGINEERING

STRUCTURAL ENGINEERING

Mechanics: Bending moment and shear force in statically determinate beams. Simple stress and strain relationship: Stress and strain in two dimensions, principal stresses, stress transformation, Mohr's circle. Simple bending theory, unsymmetrical bending, flexural and shear stresses, unsymmetrical bending, shear centre. Thin and thick cylinders, uniform torsion, buckling of column, combined and direct bending stresses.

Structural Analysis: Analysis of statically determinate and indeterminate structures, influence lines for determinate and indeterminate structures. Basic concepts of matrix methods of structural analysis.

Concrete Structures: Concrete Technology- properties of concrete, basics of mix design. Concrete design- basic working stress and limit state design concepts, analysis and design of members subjected to flexure, shear, compression and torsion by limit state methods. Basic elements of prestressed concrete, analysis of beam sections at transfer and service loads.

Steel Structures: Analysis and design of tension and compression members, beams and beam-columns, column bases. Connections- simple and eccentric, beam–column connections, plate girders and trusses. Plastic analysis of beams and frames.

Building materials and construction, construction management – principles and applications

ENVIRONMENTAL ENGINEERING

Water requirements: Quality standards, basic unit processes and operations for water treatment. Drinking water standards, water requirements, Water quality and tests, bacteriology of water – tests, basic unit operations and unit processes for surface water treatment, distribution of water.Sewage and sewerage treatment, quantity and characteristics of wastewater. Primary, secondary and tertiary treatment of wastewater, sludge disposal, effluent discharge standards. Domestic wastewater treatment, quantity of characteristics of domestic wastewater, primary and secondary treatment Unit operations and unit processes of domestic wastewater, sludge disposal.

Air Pollution: Types of pollutants, their sources and impacts, air pollution meteorology, air pollution control, air quality standards and limits.

Municipal Solid Wastes: Characteristics, generation, collection and transportation of solid wastes, engineered systems for solid waste management (reuse / recycle, energy recovery, treatment and disposal).

EIA: Evolution of EIA – Concepts – Methodologies – Screening – Scoping – Mitigation – Public participation - Environmental Audit – Life cycle assessment – EMS

TRANSPORTATION ENGINEERING

Highway Engineering: Highway development and planning - Highway alignment - Geometric design - Pavement materials - Pavement Design

Traffic Engineering: Characteristics of traffic elements – Highway capacity – Traffic studies and surveys - Road accidents - Traffic regulation and control

Railway Engineering: Location surveys and alignment - Permanent way - Geometric design - Track Junctions - Points and crossings - Railway stations and yards - Signaling and interlocking

Airport Engineering: Aircraft characteristics - Airport obstructions and zoning - Runway -Taxiways and aprons - Terminal area planning

Docks and Harbours: Types of harbour - Layout and planning principles - breakwaters – docks - wharves and quays - Transit sheds – warehouses - navigation aids

GEOTECHNICAL ENGINEERING

Soil Mechanics: Origin of soils, soil classification, three-phase system, fundamental definitions, relationship and interrelationships, permeability &seepage, effective stress principle, consolidation, compaction, shear strength.

Foundation Engineering: Sub-surface investigations- scope, drilling bore holes, sampling, penetration tests, plate load test. Earth pressure theories, effect of water table, layered soils. Stability of slopes - infinite slopes, finite slopes. Foundation types-foundation design requirements. Shallow foundations-bearing capacity, effect of shape, water table and other factors, stress distribution, settlement analysis in sands & clays. Deep foundations– pile types, dynamic &static formulae, load capacity of piles in sands &clays, negative skin friction.

WATER RESOURCES ENGINEERING

Fluid Mechanics and Hydraulics: Properties of fluids, principle of conservation of mass, momentum, energy and corresponding equations, potential flow, applications of momentum and Bernoulli's equation, laminar and turbulent flow, flow in pipes, pipe networks. Concept of boundary layer and its growth. Uniform flow, critical flow and gradually varied flow in open channels, specific energy concept, hydraulic jump. flow measurements in channels, pipes. Dimensional analysis and similitude. Velocity triangles and specific speed of pumps and turbines.

Hydrology: Rainfall, evaporation & infiltration, unit hydrographs, flood estimation, reservoir capacity, Ground water, Well hydraulics.

Irrigation: Duty, delta, estimation of evapotranspiration. Crop water requirements. Hydraulic structures, gravity dams and spillways, earthen dams. Weirs on permeable foundation, cross drainage works. Types of irrigation system, irrigation methods. Water logging and drainage.

SURVEYING

Importance of surveying, principles and classifications, mapping concepts, coordinate system, map projections, measurements of distance and directions, leveling, theodolite traversing, plane table surveying, errors and adjustments, curves, remote sensing and GIS

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

1. Data Structures and Algorithms

Development of Algorithms - Notations, Concepts - Arrays - Linked lists - Stacks and queues Trees - Tree Traversing - Operations on Binary Trees – Sorting and Searching techniques - Graphs - BFS, DFS - Shortest path problems.

2. Operating Systems

Basic OS Concepts - Thread and process scheduling - Synchronization - Semaphores - Critical regions - Deadlock prevention and recovery - Memory Management - File Management - I/O Management – Case Studies on Windows and Linux OS.

3. Computer Organization and Architecture

Basic structure of Computers **-** Arithmetic - Addition & subtraction of signed numbers - Multiplication - Integer division - Floating point operations - Pipelining - Multiple bus organization - Micro programmed control – Hazards - Memory System - Semiconductor RAM memory - Cache memory - Virtual memory - Secondary storage - I/O Organization - Interrupts - DMA - Buses - Interface circuits - Serial communication links.

4. C Programming

C programming – Memory Concepts – Arithmetic Operations - Control Statements – Functions - Pointers – Structures – User Defined Data types - File handling.

5. Microprocessors

8085 processor - Architecture - Bus organization - Registers - ALU - Instruction set of 8085 - Instruction format - Addressing modes - System design using controllers - Microprocessor Interfacing Techniques - Segmented memory concepts - Bus concepts.

DEPARTMENT OF ELECTRICAL AND ELETRONICS ENGINEERING (EEE)

Mathematics for electrical engineers;
Electric circuits, signals and systems and field theory;
dc machines, transformers and ac machines;
Transmission & distribution systems, power systems - analysis, operation & control;
Control systems;
Electrical and electronics measurements;
Power electronics and drives;
Analog and digital electronics – integrated circuits;
Microprocessors and basics of computers;

DEPARTMENT OF HUMANITIES (ECONOMICS)

Definition of Economics - National Income - Definition - Computation of National Income - Portfolio Investment - Business Cycle - Phillips Curve - Unemployment - Inflation - Aggregate Demand and Supply - Classical Vs Keynesian - Budget - Multiplier - Accelerator - Debt management - Federal Reserve System - Quantity theory of Money - Balance of Payments - Exchange Rates - IM and IS - Demand and Supply - Utility theories - Consumer Surplus - Producers Surplus - Cost Analysis – BEP

DEPARTMENT OF METALLURGICAL AND MATERIALS ENGINEERING

"The question paper for written test in dept Metallurgical and materials engineering , for temporary faculty will be at the general competency level of a degree holder in B.Tech. Metallurgical and Materials Engineering. Question will cover various areas of metallurgy and materials."

DEPARTMENT OF MANAGEMENT STUDIES

1. Marketing Management
2. Principles of management
3. Fundamentals of principal accounting
4. Financial management
5. Information Management
6. Corporate IS Strategy and Management
7. Intro to BAITC
8. System Analysis and Design
9. Software Project Management
10. Organizational behaviour
11. Human Resource Management
12. Operation Research
13. Production and operations research
14. Quantitative techniques

DEPARTMENT OF MECHANICAL ENGINEERING

Engineering Mechanics, Industrial safety, Mechatronics, Enginering Graphics, CAD/CAM, Automobile engineering, Thermal Engineering, Machine Design, Turbo machines, Power Plant Engineering, Refrigeration & Air-conditioning, Mechanics of Machines, Thermodynamics, Heat Transfer, GD & T, Machine drawing

DEPARTMENT OF PRODUCTION ENGINEERING

ENGINEERING MATHEMATICS: Linear Algebra Calculus Differential equations: Complex variables: Probability and Statistics: Numerical Methods:

GENERAL ENGINEERING: Engineering Materials: Applied Mechanics: Theory of Machines and Design: Thermal Engineering:

PRODUCTION ENGINEERING: Metal Casting: Metal Forming: Metal Joining Processes: Machining and Machine Tool Operations: Tool Engineering: Metrology and Inspection: Powder Metallurgy: Polymers and Composites: Manufacturing Analysis: Computer Integrated Manufacturing

INDUSTRIAL ENGINEERING: Product Design and Development: Engineering Economy and Costing: Work System Design: Facility Design: Production Planning and Inventory Control: Operation Research: Quality Management: Reliability and Maintenance: Management Information System. Intellectual Property System:

DEPARTMENT OF PHYSICS

Mathematical Physics: Determinants and matrices – Vector analysis – Complex analysis – Ordinary differential equations – Fourier analysis.
Classical Mechanics: Lagrangian formulation – Central force problem – Hamiltonian formulation – Rigid body motion – Special theory of relativity.
Quantum Mechanics: Schrodinger Equation – Operators and eigenfunctions – solvable problems – angular momentum and spin – approximation methods – scattering theory.
Electronics: Network analysis – semiconductor devices – amplifiers and oscillators – operational amplifiers – digital circuits.
Electromagnetic Theory: Electrostatics – Magnetostatics – Maxwell equations – Electromagnetic waves and propagation.
Statistical Mechanics: Thermodynamics – Ensemble theory – Maxwell-Boltzmann statistics – Bose-Einstein statistics – Fermi-Dirac statistics.
Solid State Physics: Crystal structure – Lattice vibrations and thermal properties – conductors – semiconductors – dielectrics – magnetic materials.
Atomic and Molecular Physics: Atomic spectra – resonance spectroscopy – IR and microwave spectroscopy – electronic spectroscopy.
Nuclear Physics: Nuclear forces – nuclear models – radioactivity – nuclear reactions – elementary particles

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI-620 015
OFFICE OF DEAN (FW)

DATA SHEET FOR TEMPORARY FACULTY

Post applied for : Temporary Faculty in Department of _____

Details of Applicant							Remarks
1.	Name and Address (with Email and Mobile No.)						
2.	Age/Date of Birth*						
3.	Category*: (SC/ST/OBC/PwD/UR)						
4.	Educational Qualifications:						
	Degree	Specialization	University	% of marks* /CGPA *	Class*	Year	
	UG						
	PG						
	Ph.D.			Awarded/Pursuing/Not registered			
5.	GATE Score *						
6.	Have you cleared NET / SLET*						
7.	Place: Date:		Signature of the Applicant				

***Attach Proof**