



JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING & MANAGEMENT
POST: VALNI, AT: KHANDALA, KATOL ROAD, NAGPUR – 441501
DEPARTMENT OF FIRST YEAR
SESSION 2019-20
SEM I

TEACHING PLAN

NAME OF THE TEACHER :- Dr. Nishigandha Gawande
SUBJECT :- Engineering Chemistry
YR/SEM :- First Year/Sem I

SUBJECT CODE :-MV1T002
SECTION :- Mechanical

Sr. No	Lec. No	Topic Code	Contents to be Covered	Planned Teaching Dates	Text Books (Page no)	Reference Book (Page no)	URL's (NPTEL/OnlineMaterial/PPT/Video)	Applications (R&D/ Industry)	Learning Outcomes
Unit 1: Energy Source									
1	1	1.01	Introduction, classification of fuel	19/8/19	T1 (77-78)	R1 (55-56)	http://www.ignou.ac.in/upload/unit-3.pdf	C1	Students should be able to understand the classification of fuel and selection of fuel in industry.
2	2	1.02	Essential properties of fuel, characteristics of good fuel,	21/8/19	T1 (87-88)	R1 (56)	https://me-mechanicalengineering.com/characteristics-and-properties-of-fuels/	C1	Students can select good fuel for industry.
3	3	1.03	solid fuel-Coal, Various types of Coal,	22/8/19	T1 (88-78)	R1 (63-65)	https://www.sciencedirect.com/science/article/pii/B978178242378200002X	C1	Students can identify quality of coal
4	4	1.04	Analysis of coal-Proximate analysis	23/8/19	T1 (92-93)	R1 (66-68)	https://www.sgs.com/en/mining/analytical-services/coal-and-coke/proximate-and-ultimate-analysis	C1	Students can find out moisture, volatile matter ash and fixed carbon from coal judge commercial grading of coal

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5	5	1.05	Analysis of coal Ultimate analysis	23/8/19	T1 (94-95)	R1 (66-68)	https://www.sgs.com/en/mining/analytical-services/coal-and-coke/proximate-and-ultimate-analysis	C1	Students can find out basic elemental composition of coal
6	6	1.06	Liquid fuel and Gaseous fuel.	24/8/19	T1 (107-109 & 141-143)	R1 (72-75)	https://nptel.ac.in/courses/103105110/	C1	
7	7	1.07	Flue Gas Analysis	26/8/19	R1 (97-99)	R1 (97-99)	https://nptel.ac.in/courses/103105110/	C1	Students can optimizing fuel/air ratio. By measuring the amount of excess oxygen and/or CO in the flue gases resulting from combustion, plant operators can operate at the best heat rate efficiency
8	8	1.08	Batteries, capacitor battery.	28/8/19	T1 (710-718)	T1 (710-718)	https://www.machinedesign.com/batteriespower-supplies/what-s-difference-between-batteries-and-capacitors	C1	Students understand concept of Batteries

Unit 2: Lubricants

9	9	2.01	Introduction, function of lubricants,	29/8/19	T1 (238-241)	R1 (427-428)	https://www.lubemonitrix.ie/functions-lubricant/	C2	Students understand the concept of friction and wear
10	10	2.02	Types of lubrication – Thick film, Thin film	31/8/19	T1 (242-243)	R1 (428-429)	https://nptel.ac.in/courses/112102015/	C2	Students understand mechanism of lubricants
11	11	2.03	Types of lubrication – Extreme pressure lubrication, classification of lubricants -	4/9/19	T1 (242-243)	R1 (429-430)	https://nptel.ac.in/courses/112102015/	C2	Students classify lubricants
12	12	2.04	Solid, Semi – solid Lubricants,	5/9/19	T1 (250-255)	R1 (432-433)	http://web.iitd.ac.in/~hirani/lec16.pdf	C2	Students can apply Solid, Semi – solid Lubricants in

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									machine
13	13	2.05	Liquid Lubricants, properties of lubricants, Physical properties – Viscosity, Viscosity index	6/9/19	T1 (256-257)	R1 (430-431)	https://www.onlinelms.org/mod/book/view.php?id=20&chapterid=254	C2	Students understands properties of Liquid Lubricants
14	14	2.06	surface tension, Oiliness, Flash point and Fire point	9/9/19	T1 (258-259)	R1 (435-438)	https://www.onlinelms.org/mod/book/view.php?id=20&chapterid=254	C2	Students can find safety measures of lubricants
15	15	2.07	Pour point and Cloud point	11/9/19	T1 (260-262)	R1 (438-440)	https://www.onlinelms.org/mod/book/view.php?id=20&chapterid=254	C2	Students can find lubricants for refrigeration system
16	16	2.08	Chemical properties – Acidity,	12/9/19	T1 (263)	R1 (440-441)	https://www.onlinelms.org/mod/book/view.php?id=20&chapterid=254	C2	Students find corrosive properties of lubricants
17	17	2.09	Emulsification, Saponification.	13/9/19	T1 (264-265)	R1 (441-443)	https://www.onlinelms.org/mod/book/view.php?id=20&chapterid=254	C2	Students can find steam emulsion no. of lubricants

Unit-3: Metallurgy

18	18	3.01	Introduction, Occurrence of metals, types of ores	13/9/19	T2 (31-32)	R1 (1021-1022)	https://www.jagranjosh.com/general-knowledge/minerals-and-ores-natural-materials-1456201467-1	C3	Students understand the difference between metallurgy and corrosion
19	19	3.02	concentration of ores by physical methods- Crushing and Sizing	14/9/19	T2 (32-33)	R1 (1021-1022)	https://www.askiitians.com/iit-jee-chemistry/inorganic-chemistry/general-principles-and-processes-of-isolation-of-elements/concentration-of-ores.html https://nptel.ac.in/content/storage2/courses/105105171/W1A1.pdf	C3	Students can remove gangue from ores
20	20	3.03	Froth- Flotation, Magnetic Separation,	16/9/19	T2 (34-35)	R1 (1022-	https://www.sciencedirect.com/topics/earth-and-planetary-science/flotation	C3	Students can remove

						1023)	sciences/flotation-froth https://www.sciencedirect.com/topics/earth-and-planetary-sciences/magnetic-separation		gangue from ores
21	21	3.04	Gravity separation method.	18/9/19	T2 (34-35)	R1 (1022-1023)	https://www.askiitians.com/iit-jee-chemistry/inorganic-chemistry/general-principles-and-processes-of-isolation-of-elements/concentration-of-ores.html https://nptel.ac.in/content/storage2/nptel_data3/html/mhrd/ict/text/105105171/lec64.pdf	C3	Students can remove gangue from ores
22	22	3.05	Chemical methods- Calcination,	19/9/19	T2 (35-36)	R1 (1022-1023)	https://nptel.ac.in/content/storage2/courses/113104060/MHB_pdf/Lecture14.pdf	C3	Students can remove gangue from ores
23	23	3.06	Roasting	20/9/19	T2 (36)	R1 (1022-1023)	https://nptel.ac.in/content/storage2/courses/113104060/MHB_pdf/Lecture14.pdf	C3	Students can remove gangue from ores
24	24	3.07	Reduction of Ore- by Pyrolysis	20/9/19	T2 (39-40)	R1 (1022-1023)	https://www.sciencedirect.com/science/article/abs/pii/S100495411500470X	C3	Students can remove gangue from ores
25	25	3.08	Chemical reductions,	23/9/19	T2 (37-39)	R1 (1024-1025)	https://revisionscience.com/a2-level-level-revision/chemistry-level-revision/bonding-and-structure/reduction-metals-extraction-ore	C3	Students can remove oxides from ores
26	26	3.09	Refining of Metals.	25/9/19	T2 (39-40)	R1 (1024-1025)	https://www.askiitians.com/iit-jee-chemistry/inorganic-chemistry/general-principles-and-processes-of-isolation-of-elements/refining-of-metals.html	C3	Students can refining the metals
Unit-4:Nanomaterials									
27	27	4.01	General introduction to nanotechnology, timeline and milestone, overview of	26/9/19	T3 (432-433)	R2 (1-11)	https://www.nano.gov/sites/default/files/pub_resource/nanoandhumanhealthandinstrumentation.p	C4	Students understand the concept of nanotechnology

			different nanomaterials available				df		
28	28	4.02	potential use of nanomaterials in electronics, sensors, catalysis, environment and cosmetics	27/9/19	T3 (438-441)	R2 (233-239)	http://www.greenpeace.to/publications/nanotech_in_electronics_2007.pdf	C4	Students can potential use of nanomaterials in electronics
29	29	4.03	Physical chemistry related to nanoparticles such as colloids and clusters: conductivity and enhanced catalytic activity compared to the same materials in the macroscopic state.	27/9/19	T3 (441-442)	R2 (345-347)	https://aip.scitation.org/doi/full/10.1063/1.4977204	C4	Students can use catalysis for synthesis of nanomaterials
30	30	4.04	Synthesis of nanomaterials: 'Top-Down'- photolithography	28/9/19	T4 (12-14)	R2 (264-266)	https://www.ttu.ee/public/m/Mehaanikateaduskond/Instituudid/Materjalitehnika_instituut/MTX9100/Lecture11_Synthesis.pdf	C4	Students can synthesis of nanomaterials
31	31	4.05	Synthesis of nanomaterials 'Bottom-Up'-	31/9/19	T4 (12-13)	R2 (266-267)	https://www.ttu.ee/public/m/Mehaanikateaduskond/Instituudid/Materjalitehnika_instituut/MTX9100/Lecture11_Synthesis.pdf	C4	Students can synthesis of nanomaterials
32	32	4.06	sol-gel method.	4/10/19	T4 (94-96)	R2 (259-260)	https://www.researchgate.net/publication/312043597_Sol-gel_process_and_its_application_in_Nanotechnology	C4	Students can synthesis of nanomaterials
33	33	4.07	Carbon nanotubes: single-walled their structures, properties and applications.	7/10/19	T4 (133-135)	R2 (243-246)	https://www.ossila.com/products/single-walled-carbon-nanotubes	C4	Students understands different structures of carbon
34	34	4.08	Multi-walled carbon nanotubes, their structures, properties and applications.	9/10/19	T4 (133-135)	R2 (243-246)	https://www.azonano.com/article.aspx?ArticleID=3469	C4	Students understands Multi-walled carbon
35	35	4.09	Potential risks of nanomaterials- environmental impact.	10/10/19	T4 (133-135)	R2 (243-246)	https://www.irmi.com/articles/expert-commentary/potential-human-health-risks-of-nanomaterials	C4	Students understands adverse effects of nanomaterials

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Unit-5 :Polymers

36	36	5.01	Classification of Polymers - PVC	11/10/19	T1 (390-391)	R1 (119-122)	https://www.britannica.com/science/polyvinyl-chloride	C5	Students understands the concept of Polymers
37	37	5.02	Bakelite - preparation, properties and applications -	11/10/19	T1 (391-392)	R1 (136-138)	https://www.quora.com/Write-the-preparation-properties-and-uses-of-Bakelite	C5	Students can manufacture Bakelite
38	38	5.03	Effect of Polymer Structure on Properties	12/10/19	T1 (392-393)	R1 (139-142)	https://www.quora.com/Write-the-preparation-properties-and-uses-of-Bakelite	C5	Students can Effect of Polymer Structure on Properties
39	39	5.04	Compounding of Plastics-	14/10/19	T1 (394-394)	R1 (171-172)	https://www.quora.com/Write-the-preparation-properties-and-uses-of-Bakelite	C5	Students can integrate Polymer
40	40	5.05	Polymer Blends	16/10/19	T1 (390-391)	R1 (174-175)	https://www.youtube.com/watch?v=M-FkYHDqEWI	C5	Students can integrate Polymer
41	41	5.06	Polymer Alloys Definition, Examples,	17/10/19	T1 (372-373)	R1 (174-175)	https://www.youtube.com/watch?v=MicULp2mpV8	C5	Students can integrate Polymer
42	42	5.07	Concepts of polymer processing	18/10/19	T1 (378-378)	R1 (127-127)	https://www.youtube.com/watch?v=MicULp2mpV8	C5	Students can process polymer
43	43	5.08	Injection molding, rheology, polymer properties	21/10/19	T1 (418-420)	R1 (173-174)	https://www.creativemechanisms.com/blog/what-cause-injection-molding-defects-and-how-to-fix-them	C5	Students can reform p[olymers
44	44	5.09	polymer analysis.	23/10/19	T1 (394-396)	R1 (135-137)	https://www.youtube.com/watch?v=MicULp2mpV8	C5	Students can analysis polymer

*T=Text Book; R= Reference Book; C= Company name; R= Research Paper

Total number of lectures as per syllabus: - 44

Total number of lectures as per planned: - 44

Final Outcome of the Subject (Maximum 6 Outcome):

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At the end of the course students will be able to

CO1. Describe types of fuel, refining of Petroleum, concentration of ores, chemical and physical properties of lubricants, nanomaterials and polymers.

CO2. Interpret the various classification of fuel, refining of petroleum, reduction of ores, classification of lubricants, various properties of nanomaterials and polymers.

CO3. Apply the Knowledge of characteristics of good fuel, Chemical and physical methods of separation of metals from ores. Mechanisms of lubricants, Synthesis of nanomaterials, liquid crystal polymers

CO4. Analyze the question on Proximate and Ultimate analysis of coal, industrial selection of lubricants, electrolysis of metals, potential use of nanomaterials, phases of thermotropic polymers

CO5. Estimate a Modal on commercial grading of coal, extraction of metals from ores, lubricants, synthesis of nanomaterials, advanced polymers.

CO6. Organize coal, lubricants, ores and their metals, nanomaterials and polymers.

Text Books:

Code	Title of the Book	Author Name/Designation/ Organization	Publisher	Edition/ Publication Year
T1	A Text book of Engineering Chemistry	Dr. S. S. Dara, Dr. S. S. Umre	S. Chand	Twelfth/ 2011
T2	Engineering Chemistry	Dr. Jayshree A. Parikh, Anurag Jain	Tech Max	First/2017
T3	Material Chemistry	Dr. Avinash Bharti, A. K. Welekar	Tech Max	First/2016
T4	Nanomaterials, Nanotechnology and Design	Michael F. Ashby, Paulo J. Ferreira, Daniel L. Schodek	Elsevier	First/2013

Reference Books:

Code	Title of the Book	Author Name/Designation/ Organization	Publisher	Edition/ Publication Year
R1	Engineering Chemistry	p. c. Jain And Monika jain	Dhanpatrai Publishing Company Ltd.	15 th Ed/ 2009
R2	Nanotechnology A gentle Introduction to the Next big Idea	Mark Ratner, Daniel Ratner	Pearson	First/2017

Company/Industry:

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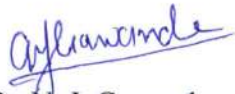
Code	Company/Industry Name	Website	Detailed Information
C1	Koradi Thermal Power Station, India	https://mahagen.co.in/	Koradi Thermal Power Station (KTPS) is located at Koradi near Nagpur, Maharashtra. The plant operates 8 units and has a total power generation capacity of 1700 MW. A proposed 440 kilovolt high power transmission line from Koradi
C2	Ballarpur Industries Limited	http://bilt.com/	BILT has six manufacturing units across India, which give the company geographic coverage over most of the domestic market. BILT has a dominant share of the high-end coated paper segment in India. The company accounts for over 50% of the coated wood-free paper market, an impressive 85% of the bond paper market and nearly 45% of the hi-bright Maplitho market, besides being India's largest exporter of coated paper.
C3	Steel Castings Of India Pvt Ltd	http://www.steelcast.net/	Company have been catering to a host of Original Equipment Manufacturer (OEM) for Industry sectors like Earth Moving, Mining & Mineral Processing, Steel Plants, Cement, Thermal & Hydro Power, Valves & Pumps, Electro Locomotive, Aerobridge, Oil Field, Shipping and General Engineering.
C4	Auto Fibre Craft, Jamshedpur	http://www.autofibrecraft.com/	Industry manufactured Custom Fabricated PP-R and PP-H Products, Plastic Extrusion Welding and Hot Air Welding, PP Tank / Polypropylene Tank for Food Processing / Electroplating Application / Chemical Storage / Chemical Processing, PVC Tank for Chemical Storage and Processing, HDPE Tank for Chemical Storage and Processing, PVDF Tank for Chemical Storage and Processing, PVC Fabric / HDPE Fabric / Tarpaulin Welding and Repair, PVC/HDPE Geomembrane Lining
C5	Jain Irrigation Systems Ltd	www.jains.com	Jain Irrigation Systems Ltd was founded in the year 1986, Jalgaon, Maharashtra, India. It is manufacturing a number of products including including drip, sprinkler irrigation systems and components, solar water pumps, plastic sheets, integrated irrigation automation systems, PVC and PE piping systems, bio-fertilizers, greenhouses, solar water-heating systems, turnkey bio gas plants and photo voltaic systems.

Research Paper:

Code	Title of the Paper	First Author Name	Journal/Conference Name	DOI no.	Issue/Volume/ Page no/Year
P1	A case study of effective factors on the right industrial lubricating oil choosing	A.Akpinar	Journal of Engineering Resarch and Applied Science	www.student%20detail/Acasestudyofeffectivefactorsontherightindustriallubricatingoilchoosing-28130-1PB.pdf	2/2/161-166/ 2013

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P2	A Review on Nanoparticles: Their Synthesis and Types	Saba Hasan	Research Journal of Recent Sciences	www.student%20det ail/RESJofRECENT SCIENCESNANOT ECHFEB2015.pdf	4/1-3/2015



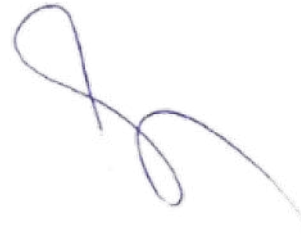
Dr. N. J. Gawande
Subject Teacher



Mr. U. V. Rathod
Academic Incharge



Dr. Amit N. Gupta
Head of Department, DOFY



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DEPARTMENT OF B.TECH. FIRST YEAR
SESSION 2019-20

TEACHING PLAN

NAME OF THE TEACHER :-PROF.U.V.RATHOD

SUBJECT :- BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

YR/SEM :- FIRST YEAR/SEM-II

SUBJECT CODE :-ME/CE2T007

SECTION/BRANCH:-ME/CE

Sr. No	Lec. No	Topic Code	Contents to be Covered	Planned Teaching Dates	Text Books (Page no)	Reference Book (Page no)	URL's (NPTEL/Online Material /PPT/Video)	Applications (R&D/ Industry)	Learning Outcomes
Unit 3: Introduction to diodes, diode circuit and Transducers									
1	1	3.01	The P-N Junction Diode, V-I characteristics, Diode as Rectifier	14/02/2020	5.15 to 5.20 page no.67 to 73	T1	https://www.electronics-tutorials.ws/diode/diode_3 https://nptel.ac.in/courses		Students will be able to * recognize the basic concept of P-N-junction diode. *Explain its V-I characteristics of
2	2	3.02	Specifications of Rectifier Diodes, Half Wave, Full wave, Bridge rectifiers	21/02/2020	6.8 to 6.13 page no.87 to 99	T1	https://nptel.ac.in/storage2/nptel_data3/html/mhrd/ict/text/lec19		*compare various diodes based on their specifications. * utilize diode as rectifier.
3	3	3.03	Equations for I_{DC} V_{DC} V_{RMS} , I_{RMS}	22/02/2020	3.5 to 3.9	T2, R1	https://nptel.ac.in/storage2/nptel_data3/html/mhrd/ict/text/lec46		*measure various electrical parameters related to diode.
4	4	3.04	Efficiency and Ripple Factor for each configuration.	22/02/2020	6.18 to 6.22 page no.101 to 106	T1	https://nptel.ac.in/storage2/courses/PDF/L-12(DK)(PE)((EE)NPTEL)		*compare efficiency and ripple of rectifier circuits.
5	5	3.05	Zener Diode, Characteristics, Specifications,	28/02/2020	6.25 to 6.26 page no.107 to 110	T1, T2	https://nptel.ac.in/storage2/nptel_data3/html/mhrd/ict/text/lec9		*Explain the concept of Zener diode and its characteristics.
6	6	3.06	Zener Voltage Regulator,	29/02/2020	6.27 to 6.28 page no.110 to 118	T1			Utilize the the concept of Zener diode in voltage regulator fabrication.

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7	7	3.07	Types of Diodes: LED, Photodiode.	29/02/2020	7.2 to 7.10 page no.126 to 133	T1	https://nptel.ac.in > storage2 > nptel_data3 > html > mhrd > ict > text > lec6		Distinguish between various diodes.
8	8	3.08	Introduction to transducer, Classification of transducers, characteristics and choice of transducers.	6/03/2020	6.3 to 6.10 page no.185 to 189	T3	https://nptel.ac.in > storage2 > nptel_data3 > html > mhrd > ict > text > lec21 www.gvpcew.ac.in >		*Elaborate the concept of transducers and classify the various transducers.
Sr. No	Lec. No	Topic Code	Contents to be Covered	Planned Teaching Dates	Text Books (Page no)	Reference Book (Page no)	URL's (NPTEL/Online Material /PPT/Video)	Applications (R&D/ Industry)	Learning Outcomes
Unit 4: Semiconductor Devices and Applications									
9	9	4.01	Introduction to transistor, Classification, CE, CB, and CC configurations	3/04/2020	8.9 to 8.13 page no.115 to 162	T1, R2	https://nptel.ac.in > content > storage2 > courses > Lec13 https://www.brainkart.com/article/Configuration-of-Transistor-Circuit--CB,-CE,-CC-configuration-Input-and-Output-Characteristics_12528/		Students will be able to *understand the working of transistor and its characteristics.
10	10	4.02	α , β , concept of gain and bandwidth.	11/04/2020	8.9 to 8.12 page no.151 to 160	T1	https://nptel.ac.in > courses > downloads > noc19_ee04_Assignment7		*Utilize the fundamental concept of current and voltage gain and its measurement.
11	11	4.03	Operation of BJT in cut-off, saturation and active regions (DC analysis).	11/04/2020	8.17 to 8.24 page 165 to 182	T1	https://nptel.ac.in > storage2 > nptel_data3 > html > mhrd > ict > text > lec23		Conceptualize the BJT operation in basic operational regions.
12	12	4.04	BJT as an amplifier, biasing techniques of BJT, BJT as a switch.	17/04/2020	8.20 to 8.22 page 171 to 180; 9.2 to 9.14 page 195 to 224	T1, T2	https://nptel.ac.in > content > storage2 > courses https://nptel.ac.in > storage2 > nptel_data3 > html > mhrd > ict > text > lec11		*utilize the BJT as amplifier and switch.
13	13	4.05	Number System,	24/04/2020	26.3 to 26.8 page 730 to 736	T1	https://nptel.ac.in > storage2 > nptel_data3 > html > mhrd > ict > text > lec3		*explain the use of various number system.
14	14	4.06	Basic logic Gates, Universal Gates	25/04/2020	26.10 to 26.17 page no.738 to 746	T1, R2	https://nptel.ac.in > storage2 > nptel_data3 > html > mhrd > ict > text > lec16 https://nptel.ac.in > storage2 > nptel_data3 > html > mhrd > ict > text > lec7		*understand the performance of logic gates in electronics

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15	15	4.07	Boolean Postulates, De-Morgan Theorems.	25/04/2020	26.20 to 26.28 page no.748 to 762	T1, R1	https://nptel.ac.in/storage2/nptel_data3/html/mhrd/ict/text/lec7 https://nptel.ac.in/storage2/nptel_data3/html/mhrd/ict/text/lec39		*utilize principle of logic gates for the construction of various electronics circuits.

*T=Text Book; R= Reference Book; C= Company name; R= Research Paper

Total number of lectures as per syllabus(Electronics): - 15

Total number of lectures as per planned: - 15

Final Outcome of the Subject (Maximum 5 Outcome):

CO1: Define fundamentals of electrical system and choose measuring instruments for measurement of electrical quantities. Describe the concept PN junction diode and its characteristics.

CO2: Classify wiring system and compare energy resources for electrical energy generation. Elaborate the transistor configuration in CE, CB & CC mode.

CO3: Plan and organize the utilization of energy resources of electrical system. Apply transistor characteristics to construct Amplifier devices.

CO4: Compare different sources of electrical system. Distinguish various logic gates and simplify the Boolean's equations.

CO5: Justify the utilization of various electrical and electronics components into electrical and electronics circuitries.

CO6: Construct various circuits using Resistors, capacitors, inductors, PN junction diode, Zener diode, transformers, transistors and logic gates.

Text Books:

Code	Title of the Book	Author Name/Designation/ Organization	Publisher	Edition/ Publication Year
T1	Principal of electronics	V.K.Mehta, Rohit Mehta,	S.Chand Publication, New Delhi,	2008
T2	Basic Electronics	B. L. Theraja	S. Chand Limited.	2007.
T3	A Textbook of Basic Electrical and Electronics Engineering,	J.B.Gupta,	Katson Publication	2006

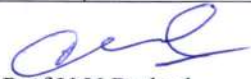
Reference Books:

Code	Title of the Book	Author Name/Designation/ Organization	Publisher	Edition/ Publication Year
R1	A Text book of Basic Electronics,	Brijesh Iyer and S. L. Nalbalwar,	Synergy Knowledgeware Mumbai.	, 2017. ISBN:978-93-8335-246-3
R2	Electronic Circuit Analysis and Design,	Donald Neaman,	McGraw-Hill Publication, 3 rd Edition.	2008

Research Paper:

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Code	Title of the Paper	First Author Name	Journal/Conference Name	DOI no.	Issue/Volume/Page no/Year
P1	PN DIODE AND ITS CHARACTERISTICS	Simran Singh Oberoi,	INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH IN TECHNOLOGY	ISSN: 2349-6002	© 2015 IJIRT Volume 1 Issue 12
P2	Transistor characteristics	H. M. Zeidler	IEEE, Transactions of the IRE Professional Group on Electron Devices	10.1109/IREPGED.1953.6811059	Volume: PGED-2, Issue: 2, Jan. 1953)
P3	Number System	<u>Ajavi Olusola Olajide</u> ajayioo.ict@gmail.com	Research Gate https://www.researchgate.net/publication/320677641	DOI: 10.13140/RG.2.2.18838.04167	27 October 2017 Page-1 to 7



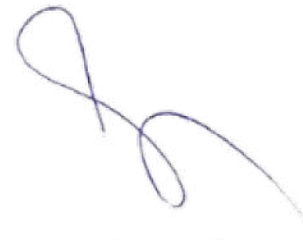
Prof.U.V.Rathod
Subject Teacher



Prof. U.V.Rathod
Academic In-charge, DOFY



Dr. Amit N. Gupta
Head of Department, DOFY, JDCOEM



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॥ ज्ञानम् सर्वार्थ साधनम् ॥

TEACHING PLAN

NAME OF THE TEACHER :- PROF. SHITAL NAVGHARE	SUBJECT CODE :- BTCVC 505
SUBJECT :- TRANSPORTATION ENGINEERING	SECTION :- A
YEAR/SEM :- THIRD YEAR/SEM V	

S N	Lec. No	Topic Code	Contents to be Covered	Planned Teaching Dates	Text Books (Page no)	Reference Book (Page no)	URL's (NPTEL/Online Material/PPT/Video)	Applications (R&D/ Industry)	Learning Outcomes
Module 1: Introduction									
1	1	1.01	Importance of various modes of transportation	Day 01	T1, T2,	R1	Video: https://nptel.ac.in/courses/105/105/105105107/ Notes: https://nptel.ac.in/courses/105/101/105101087/	Logistics Optimization	Students should get the knowledge of Importance of various modes of transportation
2	2	1.02	Highway Engineering, Road Classification	Day 02	T1, T2	R1	Video: https://nptel.ac.in/courses/105/105/105105107/ Notes: https://nptel.ac.in/courses/105/101/105101087/	Infrastructure Planning	Students Should get the knowledge about the Highway Engineering.
3	3	1.03	Developments in Road Construction, Highway Planning	Day 03	T1, T2	R1	Video: https://nptel.ac.in/course/105/105/105105107/ Notes: https://nptel.ac.in/courses/105/101/105101087/	Pavement Innovation	Student should get the knowledge of different type of Developments in Road Construction.
4	4	1.04	Alignment and Surveys	Day 04	T1, T2	R1	Video: https://nptel.ac.in/course/105/105/105105107/	Geospatial Mapping	Students Should be able to know about Alignment



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							Notes: https://nptel.ac.in/courses/105/101/105101087/	and Surveys.	
Module 2: Geometric Design									
5	5	2.01	Geometric Design- Cross section elements	Day 05	T1, T3	R1, R2, R3	Video: https://nptel.ac.in/courses/105/105/105105107/ Notes: https://nptel.ac.in/courses/105/101/105101087/	Cross Sectional Analysis	Students Should able to draw Cross section elements of roads.
6	6	2.02	Sight distances, Horizontal alignment	Day 06	T1, T3	R1, R2, R3	Video: https://nptel.ac.in/courses/105/105/105105107/ Notes: https://nptel.ac.in/courses/105/101/105101087/	Visibility Analysis	Students Should able to recognize and calculate the Sight distances and Horizontal alignment
7	7	2.03	Vertical alignment, Intersections	Day 07	T1, T3	R1, R2, R3	Video: https://nptel.ac.in/courses/105/105/105105107/ Notes: https://nptel.ac.in/courses/105/101/105101087/	Grade Optimization	Students Should able to draw Vertical alignment, Intersections
8	8	2.04	Construction of Pavements	Day 08	T1, T3	R1, R2	Video: https://nptel.ac.in/courses/105/105/105105107/ Notes: https://nptel.ac.in/courses/105/101/105101087/	Pavement Materials	Students Should able to construct the Pavements

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9	9	2.05	Construction and Maintenance of Drainage	Day 09	T1, T3	R1, R2	Video: https://www.youtube.com/watch?v=yRq_qelso84 Notes: https://nptel.ac.in/courses/105/101/105101087/	Drainage Systems	Students Should able to Construct and Maintain the Drainage
10	10	2.06	Road Arboriculture	Day 10	T1, T3	R1, R2	Video: https://www.youtube.com/watch?v=HvfKkk8MTEY Notes: https://nptel.ac.in/courses/105/101/105101087/	Green Infrastructure	Students Should able to understand the concept of Road Arboriculture
Module 3: Highway Materials									
11	11	3.01	Soil – relevant properties Various tests	Day 11	T2, T3, T4	R3	Video: https://www.youtube.com/watch?v=C3vIVtg6920 Notes: https://nptel.ac.in/courses/105/101/105101087/	Soil Testing	Students Should able to perform Various tests on relevant properties of Soil
12	12	3.02	Aggregates – strength, hardness, toughness, soundness, durability, shape, specific gravity, water absorption	Day 12	T2, T3, T4	R3	Video: https://www.youtube.com/watch?v=PkPF_qq1k-k Notes: https://nptel.ac.in/courses/105/101/105101087/	Aggregate Analysis	Students Should able to perform strength, hardness, toughness, soundness, test on Aggregates

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13	13	3.03	Bituminous materials – Bitumen, Tar, and Asphalt – various properties	Day 13	T2, T3, T4	R3	Video: https://www.youtube.com/watch?v=k1Dxy8Vftho Notes: https://nptel.ac.in/courses/105/101/105101087/	Bitumen Analysis	Students Should able to remember various properties of Bituminous materials such as Bitumen, Tar, and Asphalt .
14	14	3.04	Design of Bituminous paving mixes-Marshall stability test	Day 14	T2, T3, T4	R3	Video: https://www.youtube.com/watch?v=S0L0sNBF33w Notes: https://nptel.ac.in/courses/105/101/105101087/	Stability Analysis	Students Should able to Design the Bituminous paving mixes-Marshall stability test
Module 4: Traffic Engineering									
15	15	4.01	Traffic Characteristics, Speed, Journey Time and Delays, Vehicle Volume Counts, Origin and Destination Studies.	Day 15	T1, T2	R1	Video: https://www.youtube.com/watch?v=0yZgMc110po Notes: https://nptel.ac.in/courses/105/101/105101087/	Traffic Analysis	Students Should able to understand Traffic Characteristics, Speed, Journey Time and Delays, Vehicle Volume Counts, Origin and Destination Studies.
16	16	4.02	Analysis and Interpretation of Survey Data, Traffic Operations.	Day 16	T1, T2	R1	Video: https://www.youtube.com/watch?v=0yZgMc110po Notes: https://nptel.ac.in/courses/105/101/105101087/	Data Analytics	Students Should able to Analyze and Interpret the Survey Data, Traffic Operations.

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17	17	4.03	Design of Signals and Rotary intersections, Parking Space Design.	Day 17	T1, T2	R1	Video: https://www.youtube.com/watch?v=uCPlvu-bzDw Notes: https://nptel.ac.in/courses/105/101/105101087/	Intersection Planning	Students Should able to understand the Design of Signals and Rotary intersections, Parking Space Design.
18	18	4.04	Highway Lighting, Planning and Administration, Road Markings, Signs.	Day 18	T1, T2	R1	Video: https://www.youtube.com/watch?v=lyeGTPHONo Notes: https://nptel.ac.in/courses/105/101/105101087/	Lighting Management	Students Should able to understand the Highway Lighting, Planning and Administration, Road Markings, Signs.
19	19	4.05	Road Accidents and Safety: Classification, Causes, Mitigation and Control Measures, Aspects of Safety in Usage of Roads.	Day 19	T1, T2	R1	Video: https://nptel.ac.in/courses/105/105/105105107/ Notes: https://nptel.ac.in/courses/105/101/105101087/	Safety Engineering	Students Should able to remember the Classification, Causes, Mitigation and Control Measures, Aspects of Safety in Usage of Roads.
20	20	4.06	Type and Design of anti-crash barriers, Introduction to Intelligent Transport Systems (ITS)	Day 20	T1, T2	R1	Video: https://www.youtube.com/watch?v=4ej1XkAvzhc Notes: https://nptel.ac.in/courses/105/101/105101087/	Barrier Design	Students Should able to understand the Type and Design of anti-crash barriers, Introduction to Intelligent Transport Systems (ITS)
Module 5: Pavement Design									
21	21	5.01	Basic Principles.	Day 21	T1, T2	R1, R2	Video: https://www.youtube.com/watch?v=exctAga2KXY Notes: https://nptel.ac.in/courses/105/101/105101087/	Foundational Concepts	Students Should able to understand the Basic Principles of Pavement



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							es/105/101/105101087/		Design.
22	22	5.02	Methods for different Types of Pavements	Day 22	T1, T2	R1, R2	Video: https://www.youtube.com/watch?v=exctAga2KXY Notes: https://www.nptel.ac.in/courses/105/101/105101087/	Pavement Techniques	Students Should able to identify Methods for different Types of Pavements
23	23	5.03	Design of flexible pavement using IRC: 37-2012.	Day 23	T1, T2	R1, R2	Video: https://www.youtube.com/watch?v=uJntLOgEHD4	Flexible Design	Students Should able to design the flexible pavement using IRC: 37-2012.
24	24	5.03	Design of flexible pavement using IRC: 37-2012	Day 24	T1, T2	R1, R2	Notes: https://www.nptel.ac.in/courses/105/101/105101087/		
25	25	5.04	Design of rigid pavement using IRC: 58-2011	Day 25	T1, T2	R1, R2	Video: https://www.youtube.com/watch?v=uJntLOgEHD4	Rigid Design	Students Should able to design the rigid pavement using IRC: 58-2011
26	26	5.04	Design of rigid pavement using IRC: 58-2011	Day 26	T1, T2	R1, R2	Notes: https://www.nptel.ac.in/courses/105/101/105101087/		
Module 6: Other modes of Transport									
27	27	6.01	Introduction to Railways, Airways, Waterways	Day 27	T3	R1,R3,R4	Video: https://www.nptel.ac.in/courses/105/107/105107123/ Notes: https://www.nptel.ac.in/courses/105/101/105101087/	Transport Modes	Students Should have the knowledge of Railways, Airways, Waterways

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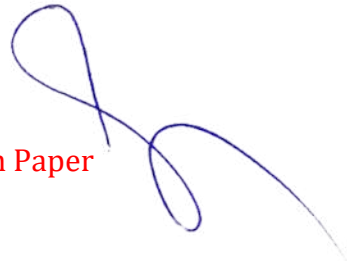


28	28	6.02	Pipeline Transportation	Day 28	T3	R1,R3,R4	Video: https://nptel.ac.in/courses/105/107/105107123/ Notes: https://nptel.ac.in/courses/105/101/105101087/	Pipeline Engineering	Students Should have the knowledge of Pipeline Transportation
29	29	6.03	Classification, Requirements	Day 29	T3	R1,R3,R4	Video: https://nptel.ac.in/courses/105/107/105107123/ Notes: https://nptel.ac.in/courses/105/101/105101087/	Standards Compliance	Students Should able to Classify transportation and its Requirements
30	30	6.04	Comparative Studies	Day 30	T3	R1,R3,R4		Comparative Analysis	Students Should able to do the Comparative Studies.

Total number of lectures as per syllabus: - 30

Total number of lectures as per planned: - 30

*T=Text Book; R= Reference Book; C= Company name; P= Research Paper


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Text Books:

Code	Title of the Book	Author Name/Designation/ Organization	Publisher	Edition/ Publication Year
T1	Highway Engineering	Khanna and Justo	Nemchand & Bros., Roorkee	2009
T2	Transportation Engineering	N. L. Arora		
T3	Highway Engineering	Bindra and Arora	Standard Publishers	

Reference Books:

Code	Title of the Book	Author Name/Designation/ Organization	Publisher	Edition/ Publication Year
R1	Traffic and Highway Engineering”	N.J. Garber and L.A. Hoel	West Publishing Company, New York	
R2	Geometric Design of Modern Highways	J.H. Jones	E & FN SPON Ltd., London.	
R3	Surface Transportation (Railways and Highways)	R. Agor	Khanna Publishers, N. Delhi ISBN NO: 978-81-7409-273-1	
R4	Planning and Design of Airports	Robert M. Horonjeff (Author), Francis X. McKelvey (Author), William J. Sproule (Author), Seth Young (Author)	McGraw Hill	5th edition (16 July 2010)

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Research Paper:

Code	Title of the Paper	First Author Name	Journal/Conference Name	DOI no.	Issue/Volume/ Page no/Year
P1	Research on Improvement of Red Clay in a Highway Engineering	Jianbao Fu	IOP Conference Series: Materials Science and Engineering	10.1088/1757- 899X/780/4/0 42039	
P2	An experimental method to design porous asphalts to account for surface requirements	Filippo G. Pratico, Paolo G. Briante, Giuseppe Colicchio, Rosario Fedele	Journal of Traffic and Transportation Engineering	10.1016/j.jtte. 2019.05.006	online 21 July 2020.

Subject Teacher

Academic In/charge

HOD, (CE)



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॥ ज्ञानम् सर्वार्थ साधनम् ॥

NAME OF THE TEACHER:- Prof. ABDUL MONISH SHEIKH		SUBJECT:- CONCRETE TECHNOLOGY		SECTION:- A					
SUBJECT CODE :- BTCVC603		YR/SEM :- 3RD year/ VI semester							
Sr No	Unit	Sub Unit	Topic	Planned Teaching Dates	Text Books (Page No)	Reference Book (Page No)	Url's (Nptel/Onlinem aterial/Ppt/Vid eo)	Applications (R&D/Industry)	Learning Outcomes
Module 1 (4 Lectures)									
1	1	1.1	Materials for Concrete: Cement, Manufacturing Process, Physical Properties, Hydration of Cement, hydration products	11/01/20 20	T1, R1	17, 19, 35, 38, 22	* https://www.youtube.com/watch?v=zCjCjp-jnMo * https://www.youtube.com/watch?v=uPAE2ZcFdo4 * https://www.youtube.com/watch?v=jJbuAAJAdpc	C1, C2, C3	Students Should get the knowledge about the Concrete Materials and ther properties
2	2	1.2	Materials for Concrete:Chemical Compounds in Cement, Types of Cement	13/01/20 20	T1, R1	19, 33, 23	https://www.youtube.com/watch?v=qk9P3e0l2lE https://www.youtube.com/watch?v=oouvhVPnuqY	C1, C2, C3	Students Should able to differentiate different types of cement used in concrete.

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Session 2019-20 (Even Sem)



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3	3	1.3	Aggregates: Classification of aggregates, Physical Properties, Bulking of Sand, Mechanical Properties	16/01/20 20	T1, R1	63, 74, 155, 54	https://www.youtube.com/watch?v=t3M9a_3BHSU https://www.youtube.com/watch?v=49yGZYeokKM	C1, C2, C3	Student able to classify the aggregates based on there properties.
4	4	1.4	Water: Specifications of Water to be used For Concrete	20/01/20 20	T1, R1	2, 96, 88	https://www.youtube.com/watch?v=t3M9a_3BHSU	C1, C2, C3	Students Should get the knowledge of specification of Water on be used for concrete.
Module 2 (4 Lectures)									
5	5	2.1	Properties of Fresh Concrete- Types of Batching, Mixing, Transportation, Placing Including Pumping and Compaction Techniques for Good Quality Concrete	23/01/20 20	T1, R1	145, 218, 350, 370, 373, 92	https://www.youtube.com/watch?v=bE9M_vTHBac https://www.youtube.com/watch?v=uksbc7n0opg	C1, C2, C3	Student acquire knowledge to analyses properties of fresh concrete

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Session 2019-20 (Even Sem)



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6	6	2.2	Workability, Factors affecting workability, Methods of Measuring Workability	27/01/2020	T1, R1	146, 154, 94	https://www.youtube.com/watch?v=8Fk1H-sQhoo	C1, C2, C3	Students should able to know the details factors affecting the Workability of concrete.
7	7	2.3	Segregation and Bleeding, setting time	30/01/2020	T1	123, 31	https://www.youtube.com/watch?v=-HPbTHFN2sU	C1, C2, C3	Students Should get the knowledge about Segregation, Bleeding and setting time of concrete
8	8	2.4	Curing of Concrete, Types of curing, Temperature Effects on Fresh Concrete	03/02/2020	T1, R1	381, 391	https://www.youtube.com/watch?v=vs8lu16evZE	C1, C2, C3	Students Should get the knowledge about Curing of Concrete, Types of curing, Temperature Effects on Fresh Concrete
Module 3 (3 Lectures)									
9	9	3.1	Admixtures In Concrete: Types, Plasticizers and Super-plasticizers and	06/02/2020	T1	102, 642	https://www.youtube.com/watch?v=NRSfUsNTPSs https://www.youtube.com/watch?v=QxSu1WUJAdY	C1, C2, C3	Students should able to know about the Admixtures of Concrete

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			their Effects On Workability						
10	10	3.2	Air Entraining Agents, Accelerators, Retarders Pozzolanic Admixtures, Green concrete,	10/02/2020	T1, R1	104, 106, 305	https://www.youtube.com/watch?v=OIB8avzQsrM https://www.youtube.com/watch?v=nTbKq3JTliE	C1, C2, C3	Students Should get the knowledge about the Air Entraining Agents, Accelerators, Retarders
11	11	3.3	Bonding Admixtures Damp-Proofing Admixtures, Construction Chemicals	13/02/2020	T1, R1	104, 127, 70	https://www.youtube.com/watch?v=NRSfUsNTPSs https://www.youtube.com/watch?v=2H8WOrQtews	C1, C2, C3	Student acquire knowledge of Bonding admixtures
Module 4 (4 Lectures)									
12	12	4.1	Desired Properties of Concrete, Strength, Durability & Impermeability	17/02/2020	T1	179, 198, 200	https://www.youtube.com/watch?v=2Q7-o0HZTOE	C1, C2, C3	Students should able to know about the Properties of concrete

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Session 2019-20 (Even Sem)



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13	13	4.2	Characteristic Strength, Compressive, Tensile and Flexure of Concrete	20/02/2020	T1	179	https://www.youtube.com/watch?v=wvm5e_pqvB4 https://www.youtube.com/watch?v=cXv5qEYvSsl	C1, C2, C3	Students should be able to know about the Characteristic Strength of Concrete
14	14	4.3	Bond Strength, Tests on Concrete, Modulus of Elasticity, Effect of W/C Ratio and admixtures on Strength	24/02/2020	T1	192, 201, 639, 419	https://www.youtube.com/watch?v=HiHJN4gDLXo https://www.youtube.com/watch?v=wDZGPepLHM	C1, C2, C3	Student should get the knowledge of Bond strength
15	15	4.4	Types of concrete, High Strength and High Performance Concrete	27/02/2020	T1	574, 313	https://www.youtube.com/watch?v=1qDEBqxoBpk https://www.youtube.com/watch?v=cbL5q0HBlnE https://www.youtube.com/watch?v=IDuSLAtpFVE&list=PLyEuOm4kr6CdZM78oCja_m69j4SP448r	C1, C2, C3	Student acquire knowledge of different types of concrete

Module 5 (4 Lectures)

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16	16	5.1	Creep and Shrinkage of Concrete, Significance, Types of Shrinkage and Their Control, Factors Affecting Creep	02/03/2020	T1, R1	194, 198, 229	https://www.youtube.com/watch?v=MP6FU7n8A0g https://www.youtube.com/watch?v=SaNoLHeS_yM	C1, C2, C3	Student should get the knowledge about Creep and Shrinkage of Concrete
17	17	5.2	Durability of Concrete: Minimum & Maximum Cement Content, Strength & Durability Relationship, Exposure to Different Conditions,	05/03/2020	T1, R1	200, 276	https://www.youtube.com/watch?v=MP6FU7n8A0g	C1, C2, C3	Student should get the knowledge about Durability of concrete
18	18	5.3	Factors Contributing to Cracks in Concrete, Sulphate Attack, Alkali Aggregate	09/03/2020	T1	198, 560, 591, 78, 136, 686, 560, 678	https://www.youtube.com/watch?v=MP6FU7n8A0g https://www.youtube.com/watch?v=4cBgCnV-kMQ	C1, C2, C3	Student acquire knowledge about the factors contributing the cracks in concrete and chemical attacks

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			Reaction (AAR), factors affecting on AAR,						
19	19	5.4	Deteriorating effects of AAR, Chloride Attack, Corrosion of Steel (Chloride Induced)	12/03/2020	T1	25, 76, 102, 561, 683 434, 512, 560	https://www.youtube.com/watch?v=YXkaKdYDaeA	C1, C2, C3	Student acquire knowledge about the deterioration due to different chemical agents
Module 6 (6 Lectures)									
20	20	6.1	Nominal Mix Concrete, Factors Governing Mix Design	16/03/2020	T1, R1	241, 377	https://www.youtube.com/watch?v=lfrzN7OsTzU	C1, C2, C3	Students Should get knowledge about the Mix design
21	21	6.2	Methods Of Expressing Proportions, Trial Mixes,	19/03/2020	T1, R1	254, 333, 398	https://www.youtube.com/watch?v=lfrzN7OsTzU	C1, C2, C3	Students Should get knowledge about the Trial mixes form mix design
22	22	6.3	Acceptance Criteria, Factors Causing Variations	23/03/2020	T1	129, 221, 226, 335	https://www.youtube.com/watch?v=lfrzN7OsTzU	C1, C2, C3	Students Should able to know about the acceptance criteria and the factors causing variations

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23	23	6.4	Field Control, Statistical Quality Control	26/03/2020	T1	220, 221	https://www.youtube.com/watch?v=lfrzN7OsTzU	C1, C2, C3	Students Should get knowledge about field control
24	24	6.5	Quality Measurement in Concrete Construction	30/03/2020	T1, R1	223,	https://www.youtube.com/watch?v=lfrzN7OsTzU	C1, C2, C3	Student acquire knowledge to measure quality in concrete used for construction
25	25	6.6	Non-destructive Testing of Concrete	09/04/2020	T1, R1	236, 423, 430, 686, 332	https://www.youtube.com/watch?v=EabtTqDjIlc	C1, C2	Students should be able to know about the Non-destructive testing of concrete

*T=Text Book; R= Reference Book; C= Company name; P= Research Paper

Total number of lectures as per syllabus: Total number of lectures as per planned: - 25

TextBooks:

Code	Title of the Book	Author Name/Designation / Organization	Publisher	Edition/ Publication Year
T1	Concrete Technology	M. L. Gambhir	Tata Mc-Graw Hill	15th edition (2015)
T2	Concrete Technology	M. S. Shetty	S. Chand	2005

Reference Books:

Code	Title of the Book	Author Name/Designation / Organization	Publisher	Edition/ Publication Year
R1	Concrete Technology	A. M. Neville & J. J. Brooks	Pearson Education	5th edition (2012)

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R2	Properties of Concrete	A. M. Neville	Pearson Education	5th edition (2012)
Company/Industry:				
Code	Company/Industry Name	Website	Detailed Information	
C1	Birla Gold Premium Cement	http://birlagoldcement.com/	<p>Birla Gold Premium Cement is a renowned brand in the cement industry for over four decades; a quality product from the “Cement Division” of Century Textiles & Industries Ltd., a part of the BK Birla Group of Companies. The Cement Division consists of four strategically located plants at Raipur in Chhattisgarh, Maihar in Madhya Pradesh, Chandrapur in Maharashtra, and Murshidabad district in West Bengal.</p> <p>With a heritage of commitment to quality, Birla Gold has played an important role in building modern India. Right from the establishment of its first plant in 1974, Birla Gold has written a legacy of superior technology, constant innovation, incredible customer experience and above all, a product that has stood the test of time.</p>	
C2	UltraTech Cement Ltd.	https://www.ultratechcement.com	<p>UltraTech Cement Ltd. is the largest manufacturer of grey cement, Ready Mix Concrete (RMC) and white cement in India. It is also one of the leading cement producers globally. Ultra Tech as a brand embodies 'strength', 'reliability' and 'innovation'. Together, these attributes inspire engineers to stretch the limits of their imagination to create homes, buildings and structures that define the new India. The company has a consolidated capacity of 117.35 Million (including Bara) Tonnes Per Annum (MTPA) of grey cement. UltraTech Cement has 23 integrated plants, 1 clinkerisation plant, 27 grinding units and 7 bulk terminals, post the Century merger. Its operations span across India, UAE, Bahrain, Bangladesh and Sri Lanka. UltraTech Cement is also India's largest exporter of cement reaching out to meet the demand in countries around the Indian Ocean and the Middle East.</p>	

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C3	Reackon Concretes Pvt. Ltd	http://www.reackon.com/	Reackon polyplast is a sister concern of Reackon Concretes Pvt. Ltd. A CRISIL accredited company with ISO 9001:2015 certification established in 2004 engaged in Manufacturing of Ready Mix Concrete and Innovative Precast Concrete Products also engaged in Manufacturing of Premium Quality P.V.C. Moulds for precast concrete products which stand to its excellence in performance and durability. The company are facilitated with highly automated machines to cater the requirements of our valued Customers across India and Abroad.
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Subject Teacher

Academic In/charge

HOD, (CE)



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
SESSION 2019-20 ODD

TEACHING PLAN

NAME OF THE TEACHER :- **Prof. Supriya S. Sawwashere**
 SUBJECT :- **Business Communication**
 YR/SEM :- **3rd /5th Sem CSE**

SUBJECT CODE :- **BTCOE505B**

Sr. No	Lec. No	Topic Code	Contents to be Covered	Planned Teaching Dates	Actual Teaching Date	Text Books (Page no)	Reference Book (Page no)	URL's (NPTEL/OnlineMaterial/PPt/Video)	Applications (R&D/ Industry)	Learning Outcomes
UNIT-I Introduction										
1	1	1.01	Introduction	02/07/2019	02/07/2019	T1 Pg:11-16,	-	https://nptel.ac.in/courses/110/105/110105052/	P1	To introduce and identify key principles in business communication and communicative competences
2	2	1.02	Definitions & Concepts	04/07/2019	02/07/2019	T1 Pg: 11-16,	-	https://nptel.ac.in/courses/110/105/110105052/		
3	3	1.03	Communicative Competence	08/07/2019	03/07/2019	T1 Pg: 11-16,	-	https://nptel.ac.in/courses/110/105/110105052/		
4	4	1.03	Communicative Competence	09/07/2019	04/07/2019	T1 Pg: 11-16,	-	https://nptel.ac.in/courses/110/105/110105052/		

Sr. No	Lec. No	Topic Code	Contents to be Covered	Planned Teaching Dates	Actual Teaching Date	Text Books (Page no)	Reference Book (Page no)	URL's (NPTEL/OnlineMaterial/PPt/Video)	Applications (R&D/ Industry)	Learning Outcomes
UNIT-II Introduction										
5		2.01	Intercultural Communication	11/07/2019	08/07/2019	T2 Pg: 25-29,	-	https://nptel.ac.in/courses/110/105/110105052/	P1	To describe different processes and considerations involved in writing in business.
6		2.02	Nonverbal Communication	13/07/2019	09/07/2019		-	https://nptel.ac.in/courses/110/105/110105052/		
7		2.03	Thought and Speech	15/07/2019	11/07/2019		-	https://nptel.ac.in/courses/110/105/110105052/		
8		2.04	Translation as Problematic Discourse	18/07/2019	13/07/2019		-	https://nptel.ac.in/courses/110/105/110105052/		

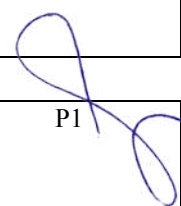
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Sr. No	Lec. No	Topic Code	Contents to be Covered	Planned Teaching Dates	Actual Teaching Date	Text Books (Page no)	Reference Book (Page no)	URL's (NPTEL/OnlineMaterial/PPT/Video)	Applications (R&D/ Industry)	Learning Outcomes
UNIT-III Introduction										
9		3.01	Barriers to Communication	21/07/2019	15/07/2019	T1 Pg: 115-126,	-	https://nptel.ac.in/courses/110/105/110105052/	P1	To illustrate the appropriate use of different channels of written communication in business.
10		3.02	Listening	22/07/2019	18/07/2019	T1 Pg:127-132	-	https://nptel.ac.in/courses/110/105/110105052/		
11		3.03	Communication Rules	25/07/2019	21/07/2019		-	https://nptel.ac.in/courses/110/105/110105052/		
12		3.04	Communication Style	26/07/2019	22/07/2019	T1Pg: 115,127	-	https://nptel.ac.in/courses/110/105/110105052/		

Sr. No	Lec. No	Topic Code	Contents to be Covered	Planned Teaching Dates	Actual Teaching Date	Text Books (Page no)	Reference Book (Page no)	URL's (NPTEL/OnlineMaterial/PPT/Video)	Applications (R&D/ Industry)	Learning Outcomes
UNIT-IV Introduction										
13		4.01	Interpersonal Communication,	29/07/2019	26/07/2019	T1 Pg: 115-126,	-	https://nptel.ac.in/courses/110/105/110105052/	P1	To categorize traditional and online tools and methods to find, evaluate, and process information.
14		4.02	Relational Communication,	01/08/2019	29/07/2019	T1 Pg:127-132	-	https://nptel.ac.in/courses/110/105/110105052/		
15		4.03	Organizational Communication	05/08/2019	05/08/2019		-	https://nptel.ac.in/courses/110/105/110105052/		

Sr. No	Lec. No	Topic Code	Contents to be Covered	Planned Teaching Dates	Actual Teaching Date	Text Books (Page no)	Reference Book (Page no)	URL's (NPTEL/OnlineMaterial/PPT/Video)	Applications (R&D/ Industry)	Learning Outcomes
UNIT-V Introduction										
16		5.01	Collaboration,	12/08/2019	12/08/2019	T1 Pg: 115-126,	-	https://nptel.ac.in/courses/110/105/110105052/	P1	To evaluate various types of business reports.
17		5.02	Communication in Groups and Teams,	16/08/2019	16/08/2019	T1 Pg:127-132	-	https://nptel.ac.in/courses/110/105/110105052/		


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18		5.03	Persuasive Communication	19/08/2019	23/08/2019		-	https://nptel.ac.in/courses/110/105/110105052/	
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Sr. No	Lec. No	Topic Code	Contents to be Covered	Planned Teaching Dates	Actual Teaching Date	Text Books (Page no)	Reference Book (Page no)	URL's (NPTEL/OnlineMaterial/PPt/Video)	Applications (R&D/ Industry)	Learning Outcomes
UNIT-VI										
19		6.01	Negotiation	23/08/2019	26/08/2019	T1 Pg: 115-126,	-	https://nptel.ac.in/courses/110/105/110105052/	P1	To Write various types of business messages, including informative messages, team-focused messages, criticism, and response messages.
20		6.02	Conflict Management	26/08/2019	29/08/2019	T1 Pg:127-132	-	https://nptel.ac.in/courses/110/105/110105052/		
21		6.03	Leadership	29/08/2019	02/09/2019		-	https://nptel.ac.in/courses/110/105/110105052/		
22		6.03	Leadership	02/09/2019	09/07/2019		-	https://nptel.ac.in/courses/110/105/110105052/		
23		6.04	Written Communication in International Business	06/09/2019	13/09/2019		-	https://nptel.ac.in/courses/110/105/110105052/		
24		6.05	Role of Technology in international Business Communication	09/09/2019	13/09/2019		-	https://nptel.ac.in/courses/110/105/110105052/		
25		6.06	Moving to Another Culture	13/09/2019	16/09/2019		-	https://nptel.ac.in/courses/110/105/110105052/		
26		6.07	Crisis Communication	16/09/2019	20/09/2019		-	https://nptel.ac.in/courses/110/105/110105052/		
27		6.08	Ethics in Business Communication	20/09/2019	25/09/2019	T1Pg: 115,127	-	https://nptel.ac.in/courses/110/105/110105052/		

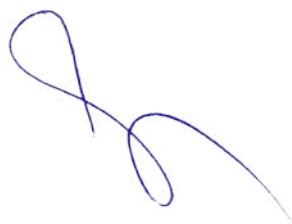
Total number of lectures as per syllabus: - 24

Total number of lectures as per planned: - 27

Final Outcome of the Subject (Maximum 6 Outcome):

After learning the course the students should be able:

1. To identify key principles in business communication. [CO1]
2. To describe different processes and considerations involved in writing in business. [CO2]
3. To illustrate the appropriate use of different channels of written communication in business. [CO3]
4. To categorize traditional and online tools and methods to find, evaluate, and process information. [CO4]
5. To evaluate various types of business reports. [CO5]
6. To write various types of business messages, including informative messages, team-focused messages, criticism, and response messages. [CO6]



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Text Books:

Code	Title of the Book	Author Name/Designation/ Organization	Publisher	Edition/ Publication Year
T1	Business Communication	K. K. Sinha	Taxmann	7th edition, 2012.
T2	Business Communication	V. Raymond Lesikar	Mc Graw Hills	1st edition, 2001.

Reference Books:

Code	Title of the Book	Author Name/Designation/ Organization	Publisher	Edition/ Publication Year
R1	Business Communication	V. Raymond Lesikar	Mc Graw Hills	6th edition, 2009.

Research Paper:

Code	Title of the Paper	First Author Name	Journal/Conference Name	DOI no.	Issue/Volume/Page no/Year
P1	Business communication in function of improving the organizational culture of the company	Gramatnikovski, Sashko Stoilkovska, Aleksandra Serafimovic, Gordana	UTMS Journal of Economics, University of Tourism and Management (Skopje)		[ISSN:] 1857-6982 [Volume:] 6 [Year:] 2015 [Issue:] 2 [Pages:] 266-279
P2	Trends in global communication policy making: Lessons from the Asian case	Stewart M. Hoover , Shalini Singh Venturelli & Douglas K. Wagner	Asian Journal of Communication		Volume 3, 1993 - Issue 1 Pages 103-132 Published online: 18 May 2009
P3	Effective Business Communication: A Key to an Outstanding Business Organization Topic Outline Topic: Effective Business Communication: A Key To An Outstanding Business	Marianne Joyce A. Sarsonas Barbi Ann S. Jane, Mae Rose P. Recilla			



Prof. Supriya Sawwashere
Subject Incharge



Miss. Swati Raut
Academic Incharge



Prof. Madhuri Patil
Head of Department IT-CSE

HOD
Computer Science & Engineering
JDCOEM, Nagpur



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DEPARTMENT OF CSE-IT

SESSION 2019-20

TEACHING PLAN

NAME OF THE TEACHER :- Prof. Madhuri M.Pal

SUBJECT :- Numerical Methods

SUBJECT CODE :- CE306

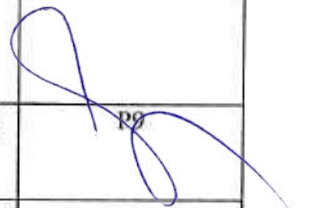
YR/SEM :- 2nd /4th Sem

Sr. No	Lec. No	Topic Code	Contents to be Covered	Planned Teaching Dates	Actual Teaching Date	Text Books (Page no)	Reference Book (Page no)	URL's (NPTEL/OnlineMaterial/PPT/Video)	Applications (R&D/ Industry)	Learning Outcomes
UNIT-I Mathematical Foundation										
PREREQUISITES: The knowledge of elementary mathematics on the level of secondary school.										
1	1	1.01	Unit I Solution of Algebraic and Transcendental Equation: Bisection method	01/01/2020	01/01/2020	T1 Pg: 21	R1 Pg:123	Video: https://www.youtube.com/watch?v=fPu7t9eP8	P2	<ul style="list-style-type: none"> Students should be able to understand and Execute basic commands and scripts in a mathematical programming language. Student will also be able to understand Using appropriate numerical methods. determine approximate solutions to systems of linear equations
2	2	1.02	Example of Bisection method	2/01/2020	02/01/2020	T1 Pg:21	R1 Pg:123	https://www.youtube.com/watch?v=7LL70V1509o	P2	
3	3	1.03	Method of false position,	6/01/2020	6/01/2020	T1 Pg:24	R1 Pg:135			
4	4	1.04	Newton's method	06/01/2020	7/01/2020	T1Pg: 33	R1 Pg:75			
5	5	1.05	Newton-Raphson method,	08/01/2020	8/01/2020	T2 pg:33,57	R1 Pg151	https://www.youtube.com/watch?v=PIPiv6gnLs		
6	6	1.06	Example of Newton	09/01/2020	9/01/2020	T1 Pg:33-59	R1 Pg.151,365			
7	7	1.07	Approximate solution of equation – Horner's method	15/01/2020	15/01/2020	T1 pg: 811		https://www.youtube.com/watch?v=mhQvmjqM1i8		<ul style="list-style-type: none"> Student will be able to understand Articulate the tradeoffs between easy computation and accuracy

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8	8	1.08	Example	16/01/2020	16/01/2020	TIPg:3 6-57, 80-92	R1 Pg: 234			<ul style="list-style-type: none"> Demonstrate proficiency in the use of input/output commands including: command line, file, and graphical ;
9	9	1.10	Revision of Unit 1	20/01/2020	20/1/2020					<ul style="list-style-type: none"> able to correctly use quantifiers also in everyday language

Sr. No	Lec. No	Topic Code	Contents to be Covered	Planned Teaching Dates	Actual Teaching Date	Text Books (Page no)	Reference Book (Page no)	URL's (NPTEL/OnlineMaterial/PPT/Video)	Applications (R&D/ Industry)	Learning Outcomes
UNIT-II Induction , Sequences and Functions										
1	10	2.01	Solution of Linear Simultaneous Equation: Gauss elimination method	20/01/2020	22/1/2020	T1 Pg: 257		https://www.youtube.com/watch?v=1CFUTFuyELo	P2	<ul style="list-style-type: none"> Create changes in program flow using control structures. Modularize program construction and increase code re-use using functions
2	11	2.02	Gauss-Jordan method	22/01/2020	23/1/2020	T1 Pg: 260		https://www.youtube.com/watch?v=cJg2AuSFdjw		
3	12	2.03	Example of Gauss	23/01/2020	27/1/2020	T1-138 T1-156 T2-232	R2: 236			
4	14	2.04	Crout's triangular method	27/01/2020	27/1/2020	T2-201		https://www.youtube.com/watch?v=xPr7YFSnmiQ	P3	
5	15	2.05	Iterative method of solution- Jacobi iteration method,	27/01/2020	29/1/2020	T1 pg-339				
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6	16	2.06	Example	29/01/2020	29/1/2020	T2-201				
7	17	2.07	Gauss-Seidal iteration method	30/01/2020	30/1/2020	T1 Pg.339		https://www.youtube.com/watch?v=ajJD0Df5CsY		
8	18	2.08	Relaxation method.	03/02/2020	03/2/2020			https://www.youtube.com/watch?v=4lcH3ZDKB5E		

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UNIT-III Combinatorics

1	19	3.01	UNIT III Finite Differences: Forward difference operator	05/02/2020	05/02/2020	T1 Pg:65		https://www.youtube.com/watch?v=nubRIbAF9cU	P3	1.Students will be able to Analyse the errors obtained in the numerical solution of problems
2	20	3.02	Backward difference operator	06/02/2020	06/02/2020	T1 Pg: 66		https://www.youtube.com/watch?v=g2laiyI01wY	P4	
3	21	3.03	Central difference operator	03/02/2020	03/02/2020	T1 Pg: 67		https://www.youtube.com/watch?v=g2laiyI01wY	P5	
4	22	3.04	Example	10/02/2020	10/02/2020	T1-65-66				2.Create changes in program flow using control structures
5	23	3.05	Newton's interpolation formula	10/02/2020	10/02/2020	T1 Pg:64,73			P4	
6	24	3.06	Newton's forward-backward-central interpolation formula,	12/02/2020	12/02/2020	T1 Pg:73		https://www.youtube.com/watch?v=nubRIbAF9cU		
7	25	3.07	Sterling formula	13/02/2020	13/02/2020	Pg.83,85				
8	26	3.08	Bessel's formula	17/02/2020	17/02/2020	Pg.83				
9	27	3.09	Interpolation with unequal intervals.	17/02/2020	17/02/2020	Pg.90		https://www.youtube.com/watch?v=nepPkXUn-Mc		Demonstrate the use of interpolation methods to find intermediate values in given graphical and/or tabulated data.

Sr. No	Lec No	Topic Code	Contents to be Covered	Planned Teaching Dates	Actual Teaching Date	Text Books (Page no)	Reference Book (Page no)	URL's (NPTEL/OnlineMaterial/PPT/Video)	Applications (R&D/ Industry)	Learning Outcomes
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UNIT-IV Relati_vF_{PS}

1	28	4.01	Unit IV Differentiation and Integration: Newton-Cortes formula	19/02/2020	19/02/2020	T1 Pg:204			P6	Design programs using a top-down design methodology.
2	29	4.02	Trapezoidal rule	20/02/2020	20/02/2020	T1 Pg: 198	R1 Pg.605	https://www.youtube.com/watch?v=96_ydBBLGIM		
3	30	4.03	Example	24/02/2020	24/02/2020	T1				
4	31	4.04	Simpson one-third rule	24/02/2020	24/02/2020	T1 Pg:200	R1 Pg:615	https://www.youtube.com/watch?v=bK1gf1n7geM		
5	32	4.05	Simpson three- eighth rule	26/02/2020	26/02/2020	T1 Pg:201	R1 Pg:615-623	https://www.youtube.com/watch?v=HRXQ51BSjVk		
6	33	4.06	Weddle's rule	27/02/2020	27/02/2020	T1 Pg: 201	R1 Pg:615-623	https://www.youtube.com/watch?v=bt_My4BtZTI		

Sr. No	Le c. No	Topic Code	Contents to be Covered	Planned Teaching Dates	Actual Teaching Date	Text Books (Page no)	Reference Book (Page no)	URL's (NPTEL/OnlineMaterial/PPT/Video)	Applications (R&D/ Industry)	Learning Outcomes
UNIT-V Graph Theory										
1	33	5.01	Unit V Numerical Solution of ODE: Picard's methods	02/03/2020	02/03/2020	T1 Pg:298			P9.P3	1.Using appropriate numerical methods, Determine approximate solutions to ordinary differential equations 2.Select appropriate numerical methods to apply to various types of problems in engineering and science in consideration of the mathematical operations involved, accuracy requirements, and available computational resources.
2	34	5.02	Taylor series method	02/03/2020	02/03/2020	T1 Pg:296	R1 Pg:	https://www.youtube.com/watch?v=IU9bGrlkqSw	P8	
3	35	5.03	Euler's method	04/03/2020	04/03/2020	T1 Pg:300	R1 Pg:710	https://www.khanacademy.org/math/ap-calculus-bc/bc-differential-equations-new/bc-7-5/v/eulers-method	P9	
4	36	5.04	Modified Euler's method	05/03/2020	05/03/2020		R1 Pg:321	https://www.youtube.com/watch?v=gr_J36P4RNs		
5	37	5.05	Runge – Kutta method	09/03/2020	09/03/2020	Pg.304	R1 Pg:729	https://www.youtube.com/watch?v=gr_J36P4RNs		

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6	38	5.07	Predictor-corrector method	09/03/2020	09/03/2020	T1 Pg309	v=hGN54bkE8A https://www.youtube.com/watch?v=ujXi29Mf83Q	
7	39	5.08	Milne's method	11/03/2020	11/03/2020	T1 Pg.311		
8	40	5.09	Adams-Bash fourth method	12/03/2020	12/03/2020	T1 Pg309	https://www.youtube.com/watch?v=ujXi29Mf83Q	
9	41	5.10	Second-order differential equation	16/03/2020	16/03/2020		https://www.khanacademy.org/math/differential-equations/second-order-differential-equations/linear-homogeneous-2nd-order/v/2nd-order-linear-homogeneous-differential-equations-1	P9

Total number of lectures as per syllabus: - 36

Total number of lectures as per planned: - 41

Final Outcome of the Subject (Maximum 6 Outcome):

After learning the course the students should be able:

- CO1. To Execute basic commands and scripts in a mathematical programming language
- CO2. Determine an interpolating function for data
- CO3. Create changes in program flow using control structures.
- CO4. Aware of the use of numerical methods in modern scientific computing .
- CO5. Using appropriate numerical methods, determine approximate solutions to ordinary differential equations
- CO6.Using appropriate numerical methods, determine approximate solutions to systems of linear equations.

Text Books:

Code	Title of the Book	Author Name/Designation/ Organization	Publisher	Edition/ Publication Year
T1	Higher Engineering Mathematics	B.S Grewal	Khanna Publication	40th Edition
T2	Introduction to Numerical Methods	S. S. Shastri	PHI Publication.	7th Edition

Reference Books:

Code	Title of the Book	Author Name/Designation/ Organization	Publisher	Edition/ Publication Year
R1	3.Numerical Methods for Engineers	Steven C Chapra	McGraw Hill Publication	5th Edition

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R2	An Introduction to Numerical Methods and Analysis	James F. Epperson	Wiley Publication	2nd Edition
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Company/Industry:

Code	Company/Industry Name	Website	Detailed Information
C1	Google	www.google.com	Search engine optimization purpose.

Research Paper:

Code	Title of the Paper	First Author Name	Journal/Conference Name	DOI no.	Issue/Volume/P age no/Year
P1	On the application of numerical methods to Hallen's equation	G. Fikioris ; Tai Tsun Wu	IEEE Transactions on Antennas and Propagation	10.1109/8.918612Mar 2001	(Volume: 49 , Issue: 3 , Mar 2001)
P2	Distributed Bisection Method for Economic Power Dispatch in Smart Grid	Zhejiang University	IEEE Transactions on Power Systems	30(6):1-12 December 2014 10.1109/TPWRS.2014.2376933	VOL. 30, NO. 6
P3	Backward r -Difference Operator and Finding Solution of Nonhomogeneous Difference Equations	Hassan Hosseinzadeh and G. A. Afrouzi	International Mathematical Forum, http://www.m-hikari.com/imf-password2007/37-40-2007/afrouziIMF37-40-2007-2.pdf	7-40-2007	2, 2007, no. 39, 1945 - 1956
P4	SOLVING DIFFERENCE EQUATIONS BY FORWARD DIFFERENCE OPERATOR METHOD	Odior A. O.1 , Charles-Owaba O. E.2 and Fadare D. A.3	http://www.arpnjournals.com/jeas/research_papers/rp_2010/jeas_0710_364.pdf	JULY 2010	ISSN 1819-6608 VOL. 5, NO. 7, JULY 2010
P5	Forward (Δ) and Backward (∇) Difference Operators Basic Sets of Polynomials in and Their Effectiveness in Reinhardt and Hyperelliptic Domains	Saheed Abayomi Akinbode, Aderibigbe Sheudeen Anjorin	Journal of Applied Mathematics and Physics https://pdfs.semanticscholar.org/0a22/c04172f8069e85146bce264857c7b3a9067a.pdf	August 2016	1630-1642
P6	Using Trapezoidal Rule for the Area Under a Curve Calculation	Shi-Tao Yeh, GlaxoSmithKline , Collegeville, PA.	https://support.sas.com/resources/papers/proceedings/proceedings/sugi27/p229-27.pdf		Paper 229-27
P7	A Runge-Kutta Method of Order 10	University of Geneva	https://www.researchgate.net/publication/31221486_A_Runge-Kutta_Method_of_Order_10	January 1978 with 2,168 Principal D. College of Engineering & Management Khandala, Katol Road Nagpur-441503	10.1093/imama/21.1.47

P8	Taylor Series Method with Numerical Derivatives for Numerical Solution of ODE Initial Value Problems	E. Miletics G. Moln'arka	ANM-030110-B http://hej.sze.hu/ANM/ANM-030110-B/anm030110b.pdf	HU ISSN 1418-7108: HEJ Manuscript no.: ANM-030110-B	
p9	Direct Solution of Second-Order Ordinary Differential Equation Using a Single-Step Hybrid Block Method of Order Five	Ra'ft Abdelrahim *,† and Zurni Omar †	file:///C:/Users/OFFICE%20USE/Downloads/mca-21-00012.pdf	MPDI	1 February 2016; Accepted: 18 March 2016; Published: 12 April 2016
P10	A Simple Derivation of Newton-Cotes Formulas with Realistic Errors	Mário M. Graça	https://arxiv.org/abs/1202.0237		1 Feb 2012 18:34:22 UTC



Miss Madhuri M.Pal
Subject Teacher



Miss. Swati Raut
Academic Incharge



Miss. Madhuri M.Pal
Head of Department, IT-CSE
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Department of Electrical Engineering

"Igniting minds to illuminate the world"

2019-20



Teaching Plan

Course : B. Tech in Electrical Engineering	Year/Semester : 3 rd Semester (2 nd Year)	
Name of the Teacher : Pratiksha Panchbhai	Subject Code : EE3T004	
Subject : Network Analysis		
Periods per Week (each 60 min)	Lecture	3
	Tutorial	-
	Practical	2

Course Objective	Course Outcomes
<ol style="list-style-type: none">1. The fundamental principles of electrical circuit analysis2. To become adept at using various methods of circuit analysis, including simplified methods such as series parallel reductions, voltage and current dividers, and the mesh - node method.3. To appreciate the consequences of linearity, in particular the principle of superposition and Thevenin - Norton equivalent circuits.4. To analyze energy storage elements.5. To utilize Laplace transforms for circuit analysis.6. To analyze four terminal networks using two-port parameters.	<ol style="list-style-type: none">1. Define basic concepts and principles related to Circuit Analysis2. Identify the super mesh & super nodal problems.3. Apply a variety of circuit analysis methods including theorems and Laplace transform4. Solve two port network problems.5. Design and develop network equations and their solutions.6. Select best possible method of circuit analysis for a given situation

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Sr. No	Lec. No	Topic Code	Contents to be Covered	Planned Teaching Dates	Text Books (Page no) Reference Book (Page no)	URL's (NPTEL/Online Material/PPt/Video)	Applications (R&D/ Industry)	Learning Outcomes	CO mapping
Unit I									
1	1	1	V-I relationship for Inductance and Capacitance	Day 1	R2(9.26-9.40)			To express the VI relationship of inductor & capacitor.	CO1
2	2	2	Constant Flux Linkage Theorem and Constant Charge Theorem	Day 2	R5(1)			To define the flux linkage & constant charge theorem	CO1
3	3	3	Dependent and Independent Sources, Active & Passive Elements	Day 3	R1 (2-16)	https://www.youtube.com/watch?v=zkWvL1pPkMY&feature=youtu.be Duration 1 to 13.2 min		To know the different Sources & Elements.	CO1
4	4	4	Source Transformation	Day 4	R3(16-21)	https://www.youtube.com/watch?v=XJlfAAZB-CGM&feature=youtu.be Duration : 32.38 Min		To analyse the circuits by using source transformation method	CO1
5	5	5	Principle of duality	Day 5	R2(9.52-9.58)	https://www.youtube.com/watch?v=kg7cBLfVlRc&feature=youtu.be Duration : 1 - 12 Min		To define & Solve the duality problems	CO2
Unit II									
6	6	6	Mesh analysis of circuits containing resistors, inductors, capacitors, transformers, and both independent and dependent sources to determine current, voltage, power,	Day 6	R3(989-1004)			To calculate the current at each loop. And solve the given network using loop current methods	CO2, CO3, CO5

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			and energy						
7	7	7	Concept of super mesh	Day 7	R3(989-1004)			To identify the super mesh circuit & calculate the current at each loop.	CO2
8	8	8	Mutual inductance, coefficient of coupling, Dot convention, dot marking in coupled coils.	Day 8	R3(16-21)			To Understand the concept of Mutual inductance and dot marking.	CO1,CO5
9	9	9	Nodal analysis of circuits containing resistors, inductors, capacitors, transformers, and both independent and dependent sources to determine current, voltage, power, and energy	Day 9	R5(49-69)	https://www.youtube.com/watch?v=s-0YeOwr-zl&feature=youtu.be Duration : 29.37 Min		To calculate the voltage at each node relative to the reference node (or ground)	CO2,CO3,CO5
10	10	10	Concept of super node	Day 10	R3(989-1004)			To identify the super node circuit	CO2
Unit III									
11	11	11	Linearity theorem	Day 11	i. R3(1021-1029)	https://youtu.be/LPttepJwgNE Duration: 15 to 30 Min		To find the total response to sinusoidal ac and dc inputs.	CO1,CO3,CO5
12	12	12	Thevenin's Theorem	Day 12	R3(1005-1020)	https://youtu.be/yU7sxfjXGUo	R1	To simplify any linear circuit, no matter how complex, to an equivalent circuit with just a single voltage source and series resistance connected to a load.	CO1,CO3,CO5

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13	13	13	Norton's Theorem	Day 13	R3(1005-1020)	https://youtu.be/7zOuepSrIYE		To simplify any linear circuit, no matter how complex, to an equivalent circuit with just a single current source and parallel resistance connected to a load.	CO1,CO3,CO5
14	14	14	Maximum Power Transfer Theorem	Day 14	R3(1032-1037)	https://youtu.be/X_4hyjXwahw		To determine the value of load resistance R_L , such that it receives maximum power from the DC source	CO1,CO3,CO5
15	15	15	Reciprocity Theorem	Day 15	R3(1038-1039)	https://youtu.be/RU2t-5JeLjk Duration : 1 - 15 min		To illustrate Reciprocity theorem	CO1,CO3,CO5
16	16	16	Compensation theorem, Tellegen's theorems	Day 16	R3(1038-1039)			To illustrate compensation & tellegens theorem	CO1,CO3,CO5
Unit IV									
17	17	17	Linear Differential Equations for Series RC, Parallel RC, Series RL, Parallel RL, Series RLC, Parallel RLC and Coupled Circuits	Day 17	R1(99-106) R1(139-141)			To Select First order and Second order D.E	CO5,CO1
18	18	18	Complete Solution for step/impulse/sinusoidal voltage/current inputs	Day 18	R4(155-162)			To Examine Time constant through particular integral	CO5,CO1

19	19	19	Complete Solution for step/impulse/sinusoidal voltage/current inputs (Numerical)	Day 19	R4(155-162)			To solve the numerical on first order	CO5,CO1
20	20	20	Natural Response-Transient Response-Time Constant-Rise and Fall times-Concept of D.C. steady state	Day 20	R1(118-127)			To define the Transient Analysis	CO,CO1
21	21	21	sinusoidal steady state-Frequency Response of simple circuits from steady state solution	Day 21	R1(118-127)			To recall A.C. sinusoidal steady state network	CO5,CO1
22	22	22	Solution of two mesh circuits by differential equation method Determination of initial conditions	Day 22	R1(351-353)			To write and Solve Node equation in matrices form	CO5,CO6
23	23	23	Numerical	Day 23	R1(351-353)			To solve the numerical	CO6
Unit V									
24	24	24	Review of Laplace Transform & Properties	Day 24	R4(171-184)			To recall the basic concept of L.T.	CO1,CO5
25	25	25	Partial fractions, Concept of initial and final condition, Singularity functions	Day 25	R4(171-184)			To Summarize different function	CO1,CO5
26	26	26	Steady state and transient state analysis	Day 26	R4(209-213)			To recall A.C. sinusoidal steady state network	CO1,CO5

			of RL, RC, RLC network with and without initial conditions with Laplace transforms						
27	27	27	Network Functions: Driving points and transfer functions	Day 27	R4(217)			To compare various admittances and impedances	CO1,CO5 ,CO3
28	28	28	Poles, zeros of transfer function, their properties.	Day 28	R1(279-285) R2(12.1-12.5)			To explain the concept of poles and zeros through transfer function	Co1,CO5
29	29	29	Numerical	Day 29	R2(13.53-13.63)				
Unit VI									
30	30	30	Two port networks, characterizations in terms of impedance	Day 30	R1(13.1-13.24)			To define the two port network	Co4,CO1
31	31	31	characterizations in terms of admittance, hybrid and transmission parameters	Day 31	R2(13.37-13.44)			To interpret difference between Z, Y, and transmission parameter	Co4,CO1
32	32	32	Conditions for symmetry and Reciprocal	Day 32	R1(285-290)			To define the symmetry & reciprocal condition.	Co4
33	33	33	inter relationships among parameter sets Reciprocity Theorem- Interconnection of Two port networks: Series	Day 33	R1(279-285) R2(12.1-12.5)			To utilize equations to solve complex circuits through parameter sets	Co4,CO3
34	34	34	Parallel and Cascade connection	Day 34	R2(13.37-13.44)			To identify & solve parallel & Cascade connection	Co6

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35	35	35	Numerical	Day 35	R2(13.53-13.63)		To solve the numerical on two port circuit	Co6,CO5, Co4
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*T=Text Book; R= Reference Book; C= Company name; R= Research Paper

Total number of lectures as per syllabus: - 35

Total number of lectures as per planned: -35

Assignment Plan				
Assignment No.	Topic	Given Date	Submission Date	Mapped With CO
1	Source Transformation & Duality	04/10/2019	15/10/2019	CO3, CO2,CO1
2	Mesh, Nodal Analysis and theorems	21/10/2019	03/11/2019	CO3, CO2, CO6
Content Beyond Syllabus Topic – Planned				
Sr. No.	Content Beyond Syllabus Topic	Date Given	Mapped with CO's not covered in TP	
1	ABCD Parameters of Transmission Line	15/10/2019	CO3, CO2,CO1	

Text Books / Reference Books:

Code	Title of the Book	Author Name/Designation/ Organization	Publisher	Edition/ Publication Year
R1	Network Analysis	Mac. E Van Valkenburg	Pearson College Div	Third Edition
R2	Network Analysis & Synthesis	Ravish Singh	McGraw Hill Education India Pvt Ltd;	1st edition (January 1, 2013)
R3	Circuit theory	A. Chakrabarti	Dhanpat Rai & Co.	2009
R4	Network Analysis	Dr. Khobragde & S.D.Naik	Professional Publication	2008
R5	Electrical Circuit Analysis & Synthesis	Nimje & D.P Kothari	New Age International Private Limited	2017

Research Paper:

Code	Title of the Paper	First Author Name	Journal/Conference Name	DOI no.	Issue/Volume /Page no/Year
R1	Performance predetermination of single-phase induction motors using Thevenin's, Norton's and Maximum power transfer theorems	R. Karthigaivel; N. Kumaresan; M. Subbiah	2015 International Conference on Computer Communication and Informatics (ICCCI)	<u>10.1109/ICCCI.2015.7218163</u>	2015



Subject Teacher



Academic Incharge



HOD, EE



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DEPARTMENT OF ELECTRONICS & TELECOMMUNICATION ENGINEERING
SESSION 2019-20

TEACHING PLAN

NAME OF THE TEACHER: Mr. V. P. Choudhari
 SUBJECT: Digital Logic Design
 YR/SEM.: 2nd/3rd

SUBJECT CODE: **BTEXC305**
 SECTION:

Sr. No.	Lec. No.	Topic Code	Contents to be Covered	Planned Teaching Dates/ Days	Text Book (Page no)	Reference Book (Page no)	URL's (NPTEL/Online Material/PPt/Video)	Applications (R&D/ Industry)	Learning Outcomes
UNIT-I: COMBINATIONAL LOGIC DESIGN									
1	1	1.1	Standard representations for logic functions (SOP form)	Day 1	R1 (166-173) R2(46-53) R3(108-112) R4(196-214)		https://nptel.ac.in/course/s/117106086/3.4.5		Students will be able to model Logic and switching expression
2		1.2	Standard representations for logic functions (POS form)						
3	2	2.1	k map representation of logic functions minimization for min-terms	Day 2	R1 (173-186) R2(67-79, 81-84) R3(117-119) R4(196-214)		https://nptel.ac.in/course/s/117106086/6.7		Students will be able to optimize logic circuit in terms of gate requirement and speed
4	3	3.1	k map representation of logic functions minimization for max-terms	Day 3	R1 (187-190) R2(67-79) R4(196-214)		https://nptel.ac.in/course/s/117106086/6.8		
5	4	4.1	k map representation with don't care conditions	Day 4	R1 (190-192) R2(84-87) R4(223-228)		https://nptel.ac.in/course/s/117106086/7.8		Students will be able to design optimized circuit
6	5	5.1	Arithmetic Circuits Adders	Day 5	R1 (192-195) R2(143-157) R6(197-204)		https://nptel.ac.in/course/s/117106086/11		Students will be able to design arithmetic circuit and compare performance

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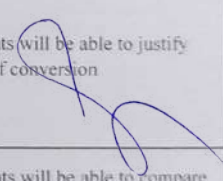
7	6	6.1	Arithmetic Circuits Subtractor. Adders and their use as subtractor	Day 6	R1 (242) R2(143-157) R6(205-218)	https://nptel.ac.in/course/s/117106086/13,14	C1-C11, P11, P18+A30	Students will be able to reuse circuit with little modification in design
8	7	7.1	Look ahead carry adder	Day 7	R1 (243-244) R2(147-150) R3(293-298)	https://nptel.ac.in/course/s/117106086/12		Students will be able to understand fastest adder and its comparison with ripple adder
9	8	8.1	Code converters	Day 8	R1 (258-268) R2(140-142) R4(305-311)	https://nptel.ac.in/course/s/117106086/9		Students will be able to design circuit which act as interface between user and machine.
10	9	9.1	BCD - to - 7 segment decoder	Day 9	R1 (196-198, 271-274) R6(504-507)			Students will be able to design circuit with common anode or common cathode display.
11	10	10.1	ALU	Day 10	R1 (250-252) R3(306-311) R6(229-231)			Students will be able to analyse circuit for various arithmetic and logic operations.
12	11	11.1	Digital Comparator	Day 11	R1 (252-255) R2(160-161) R6(174-178)			Students will be able to compare digital data with designed circuit.
13	12	12.1	Parity generators	Day 12	R1 (256-258) R2(102-105) R6(163-167)	https://nptel.ac.in/course/s/117106086/10		Students will be able to design even and odd parity circuit for communication systems
14	13	13.1	Parity checkers	Day 13	R1 (256-258) R2(102-105) R6(168-174)			
15	14	14.1	Design of Multiplexers	Day 14	R1 (231-238) R2(168-174) R6(495-498)	https://nptel.ac.in/course/s/117106086/29		Students will be able to decide on a choice amongst multiple
16	15	15.1	Design of De-multiplexers	Day 15	R1 (238-241) R6(495)	https://nptel.ac.in/course/s/117106086/30		Students will be able to design circuit which act as a key element in memory interfacing
17	16	16.1	Design of Decoders.	Day 16	R1 (238-241) R2(162-165) R6(493-494)	https://nptel.ac.in/course/s/117106086/10,30		

UNIT-II: SEQUENTIAL LOGIC DESIGN

18	17.1	1 Bit Memory Cell	R1 (280-281)
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19	17	17.2	Clocked S R flip flop	Day 17	R1 (282-283) R2(200-202) R6(295-303)	https://nptel.ac.in/courses/117106086/17	C1-C11, P19	Students will be able to understand basic memory element and its limitation.
20	18	18.1	J K flip flop	Day 18	R1 (284-287) R6(328-330)	https://nptel.ac.in/courses/117106086/17	C1-C11, P28	Students will be able to model practical memory element and its requirement.
21		18.2	MS J-K flip flop		R1 (287-288)	https://nptel.ac.in/courses/117106086/18		
22	19	19.1	D and T flip-flops	Day 19	R1 (288-289) R6(303-304)	https://nptel.ac.in/courses/117106086/17	C1-C11, P28	Students will be able to use optimized inputs for storage requirement.
23	20	20.1	Preset and Clear terminals	Day 20	R1 (283-284)	https://nptel.ac.in/courses/117106086/17,18	C1-C11, P28	Students will be able to model initial power on condition in sequential design.
24	21	21.1	Excitation Table for flip flops	Day 21	R1(290) R4(489-492)	https://nptel.ac.in/courses/117106086/19	C1-C11	Students will be able to identify input requirement of sequential circuit in order to get specific change in its state.
25	22	22.1	Conversion of flip flops.	Day 22	R1 (293-294) R4(492-497)		C1-C11	Students will be able to justify need of conversion
26	23	23.1	Shift registers	Day 23	R1 (312-318) R2(255-263) R6(355-364)	https://nptel.ac.in/courses/117106086/21	C1-C11	Students will be able to compare various types and will choose correct type in circuit design.


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27	24	24.1	synchronous up/down counter	Day 24	R1 (312-318) R2(245-246, 282-288) R3(355-367) R4(538-546)	https://nptel.ac.in/courses/117106086/20	C1-C11+A64	Students will be able to design sequence counters.
28	25	25.1	synchronous random counters	Day 25	R2 (288- 293) R3(355-367) R6(396-398) R4(547-558)	https://nptel.ac.in/courses/117106086/24	C1-C11, P13, P20+F124	Students will be able to design counters which offer variable frequency.
29	26	26.1	Ripple counters	Day 26	R1 (321-324) R2(268-272) R6(393-396, 401-402) R4(529-533)	https://nptel.ac.in/courses/117106086/19.20	C1-C11, P13, P21-P23	Students will be able to design sequential counters and compare its performance.
30		26.2	definitions of lock out, Clock Skew, and Clock jitter.		R3 (334-335, 410) R4(481-482)			Students will be able to understand hazards in design of sequential circuits.
UNIT-III: STATE MACHINES								
31	27	27.1	Mealy machines representation, State diagram, State table, State reduction, State assignment	Day 27	R1 (348-369) R2(220) R4(585-591)	https://nptel.ac.in/courses/117106086/23.26	C1-C11	Students will be able to model real world issues with the state machines and compare two types for hardware optimization
32	28	28.1	Moore machines representation	Day 28	R1 (348-369) R2(220)	https://nptel.ac.in/courses/117106086/26	C1-C11	
33	29	29.1	Sequence detector.	Day 29	R1 (348-369) R2(238-244) R4(598-601)	https://nptel.ac.in/courses/117106086/27	C1-C11, P20	Students will be able to design sequence detector for communication systems.
UNIT-IV: DIGITAL LOGIC FAMILIES								
34	30	30.1	Classification of logic families	Day 30	R3(221-230)			Students will be able to compare unipolar and bipolar families.

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35	31	31.1	Characteristics of digital ICs- Speed of operation, power dissipation, figure of merit, fan in, fan out, current and voltage parameters, noise immunity, operating temperatures and power supply requirements.	Day 31	R1 (106-109) R2 (488-492) R3(221-224)		Students will be able to analyse digital circuit on these mentioned parameters.
36	32	32.1	TTL logic, Operation of TTL NAND gate, active pull up	Day 32	R1 (120-124) R2 (498-506)	C1-C11, P24-P27, P29	Students will be able to justify usage of bipolar family in circuit design with related issues.
37		32.2	TTL logic, Wired AND, open collector output, unconnected inputs.		R1 (124)		
38	33	33.1	CMOS logic – CMOS inverter, NAND, NOR gates, unconnected inputs, wired logic, open drain output.	Day 33	R1 (137-145)		Students will be able to justify usage of unipolar family in circuit design with related issues.
39	34	34.1	Interfacing CMOS and TTL, Comparison table of Characteristics of TTL, CMOS, ECL, RTL, I ² L and DCTL	Day 34	R1 (149-151)		Students will be able to compare various logic families and their performance.

UNIT-V: PROGRAMMABLE LOGIC DEVICES AND SEMICONDUCTOR MEMORIES

40	35	35.1	Programmable logic devices: architecture, Study of PROM & Designing combinational circuits	Day 35	R1 (523-524) R2 (322-326)	https://nptel.ac.in/courses/117106086/31.32.33	C1-C11, P30	Students will be able to understand generalized architecture of PLD and its limitation in combinational logic design.
41	36	36.1	PAL, PLA, Designing combinational circuits using PLDs.	Day 36	R1 (524-542) R2 (328-336) R3(468-470)		C1-C11, P30	Students will be able to use PLD for combinational logic design.

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42	37	37.1	General Architecture of FPGA and CPLD	Day 37	R1 (554-572) R2 (336-351) R3(471-485) R8(255-263)		C1-C11, P12, P16, P17	Students will be able to understand and analyse circuit designed with efficient generalized structure.
43	38	38.1	Semiconductor memories: memory organization and operation, expanding memory size	Day 38	R1 (463-472) F68		C1-C11, P10	Students will be able to understand memory utilization in system design.
44	39	39.1	Classification and characteristics of memories, RAM, ROM, EPROM, EEPROM, NVRAM, SRAM, DRAM.	Day 39	R1 (472-474, 487-493) R6(558-567) R8(77-90+F57)	https://nptel.ac.in/courses/117106086/34,35	C1-C11, P10	Students will be able to classify memories and use it based on various parameter.
UNIT-VI: INTRODUCTION TO VHDL								
45	40	40.1	Behavioral modelling Lexical elements, data objects types, attributes, operators	Day 40	R2(182-184) R5(33-101) R10(16-37, 74-107)		C1-C11, P1-P9, P14, P15	Students will be able to design digital circuits with software tool and understand various constructs of VHDL to model circuit design.
46	41	41.1	Data flow modelling	Day 41	R2(179-182) R5(103-124) R10(16-37)		C1-C11, P1-P9, P15	Students will be able to design and analyse circuit based on data flow.
47	42	42.1	Structural modelling	Day 42	R5(125-137) R10(7-8)		C1-C11, P1-P9, P15	Students will be able to use basic designed blocks in high level design.
48	43	43.1	Combinational circuit design examples in VHDL.	Day 43	R5(265-276) R9(44-55, 121-155)		C1-C11, P1-P9, P15+A63	Students will be able to model digital combinational circuit through software constructs.

*T=Text Book; R= Reference Book; C= Company name; P= Research Paper

Total number of lectures as per syllabus: - 36

Total number of lectures as per planned: - 43

Final Outcome of the Subject (Maximum 6 Outcome):

On completion of the course, students will be able to _____

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CO1.	Use the basic logic gates and various reduction techniques of digital logic circuit in detail.
CO2.	Design combinational and sequential circuits.
CO3.	Design and implement hardware circuit to test performance and application.
CO4.	Understand the architecture and use of VHDL for basic operations and Simulate using simulation software.

Text/Reference Books:

Code	Title of the Book	Author Name/Designatio	Publisher	Edition/ Publication Year
R1	Modern Digital Electronics	R.P. Jain	Tata McGraw Hill	3rd / 2007
R2	Digital Design	M. Morris Mano	Prentice Hall of India	4th / 2013.
R3	Digital Circuit Design with VHDL	Pedroni V.A.	Prentice Hall India	2nd / 2001
R4	Fundamentals of digital circuits	Anand Kumar	Prentice Hall of India	1st / 2001
R5	VHDL Primer	J Bhaskar	Techmedia	4th
R6	Digital Electronics	James Bignell, Robert Donovan	Thomson India	2007
R7	An Engg. Approach to Digital Design	W. Fletcher	Prentice Hall India	EEE / 2009
R8	Complete Digital Design	Mark Balch	Tata McGraw Hill	2005
R9	Digital System Design using VHDL	Charles Roth	Tata McGraw Hill	2nd / 2012
R10	VHDL Programming by Example	Douglas Perry	Tata McGraw Hill	4th / 2002

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Company/Industry:

Code	Company/Industry Name	Website	Detailed Information
C1	Bosch	www.bosch.in	Bosch is a leading supplier of technology and services in the areas of Mobility solutions, industrial technology, consumer goods and energy and building technology.
C2	Mathworks	www.mathworks.com	It is the leading developer of mathematical computing software for engineers and scientists. Analyze data, develop algorithms and create mathematical model
C3	Indian Space Research Organization	www.isro.gov.in	Harness space technology for national development, while pursuing space science research and planetary exploration. Designs and develops of Launch vehicles and satellites and related technologies.
C4	Defence Researc & Development Organization	www.drdo.gov.in	Designs, develops and lead to production state-of-the-art sensors, weapon systems, platforms and allied equipment for defence services in India. Provides technology solutions to the services and build strong indigenous technology base.
C5	Hindustan Aeronautics Limited	www.hal-india.co.in	It is a significant global player in the aerospace industry. Achieves self reliance in design, development, manufacture, upgrade and maintenance of aerospace equipment diversifying into related areas.
C6	Mahindra Aerospace	www.mahindraaerospace.com	Manufactures a utility and versatile aircraft in its class.
C7	AMD	www.amd.com	Develops computer processors and related technologies like chipsets, Embedded and Graphic processors etc.
C8	XILINX	www.xilinx.com	Primary supplier of Programmable logic devices
C9	Qualcomm	www.qualcomm.com	Invent mobile technology breakthroughs.
C10	Bharat Electronics Ltd.	www.bel-india.in	Indian state owned aerospace and defence company. Manufactures advanced electronic products for the Indian armed forces.
C11	Bharat Heavy Electricals Ltd.	www.bhel.com	BHEL is one of the largest engineering and manufacturing companies engaged in design, engineering, construction, testing, commissioning and servicing of a wide range of products and services in the field of power, transmission, renewables, transportation, water etc.

Research Paper:

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Code	Title of the Paper	First Author Name	Journal/Conference Name	DOI no.	Issue/Volume/Page no/Year
P1	Digital statistical analysis using VHDL	Manfred Dietrich	Design, Automation & Test in Europe Conference & Exhibition	DOI: 10.1109/DATE.2010.5456899	2010
P2	VHDL: a powerful digital design and simulation tool	R. Dabdoub	SOUTHEASTCON '96	DOI: 10.1109/SECON.1996.510130	1996
P3	System level design, a VHDL based approach	J. van den Hurk	EURO-DAC. European Design Automation Conference	DOI: 10.1109/EURDAC.1995.527461	1995
P4	Modeling digital systems using VHDL	P.J. Ashenden	IEEE Potentials	DOI: 10.1109/45.666643	1998 Volume: 17, Issue: 2
P5	A bottom-up approach to digital design with FPGA	Giuliano Donzellini	IEEE International Conference on Microelectronic	DOI: 10.1109/MSE.2011.5937085	2011
P6	VHDL-based digital circuit synthesis: a case study	F.L. Viana	Third IEEE International Caracas Conference on Devices, Circuits	DOI: 10.1109/ICCDACS.2000.869810	2000
P7	VHDL implementation of a bidirectional interface for 3ATI avionic sub-systems	P. Mahdian	The 23rd Digital Avionics Systems Conference (IEEE)	DOI: 10.1109/DASC.2004.1390828	2004

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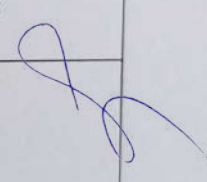
P8	On comparing different modeling styles [VHDL]	W. Ecker	VHDL International Users' Forum, Fall Conference	DOI: 10.1109/VIUF.1997.623959	1997
P9	VHDL: software based hardware designs	S.V. Wunnava	IEEE Southeastcon '98 'Engineering for a New Era'	DOI: 10.1109/SECON.1998.673377	1998
P10	Simple traffic light controller: A digital systems design project	Jose E. Ortiz	IEEE SoutheastCon	DOI: 10.1109/SECON.2010.5453915	2010
P11	Project based learning experience in VHDL digital electronic circuit design	Felipe Machado	IEEE International Conference on Microelectronic Systems Education	DOI: 10.1109/MSE.2009.5270831	2009
P12	VHDL based circuits design and synthesis on FPGA: A dice game example for education	Sarah Toonsi	IEEE 2nd International Conference on Signal and Image Processing (ICSIP)	DOI: 10.1109/SIPROCESS.2017.8124575	2017
P13	VHDL-based design and design methodology for reusable high performance direct digital frequency synthesizers	I. Janiszewski	38th Design Automation Conference (IEEE Cat. No.01CH37232)	DOI: 10.1109/DAC.2001.156205	2001

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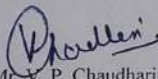
P14	Design and implementation of digital systems for automatic control based on behavioural descriptions	P. Kollig	IEE Colloquium on Digital System Design Using Synthesis Techniques (Digest No: 1996-029)	DOI: 10.1049/ic:19960163	1996
P15	Incorporating VHDL in teaching combinational logic circuit	Husna Zainol Abidin	2nd International Congress on Engineering Education	DOI: 10.1109/ICEED.2010.5940796	2010
P16	Digital design of DS-CDMA transmitter using VHDL and FPGA	K.E. Mohamed	13th IEEE International Conference on Networks Jointly held with the 2005 IEEE 7th Malaysia International Conf on Communication	DOI: 10.1109/ICON.2005.1635578	2005, Volume: 2
P17	Design of combinational logic training system using FPGA	Sujitra Sothong	IEEE Frontiers in Education Conference (FIE)	DOI: 10.1109/FIE.2010.5673663	2010
P18	Top-down design process for gate-level combinational logic design	R.S. Sandige	IEEE Transactions on Education	DOI: 10.1109/13.144655	1992 Volume: 35, Issue: 3
P19	A scan design for asynchronous sequential logic circuits using SR-latches	Ming-Der Shieh	36th Midwest Symposium on Circuits and Systems	DOI: 10.1109/MWSCAS.1993.343339	1993
P20	Design of sequential logic circuits based on Evolvable Hardware	Zhang Zhiwu	IEEE 10th International Conference on Electronic Measurement & Instruments	DOI: 10.1109/ICEMI.2011.6037897	2011 Volume: 3

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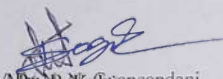
P21	An efficient modeling and synthesis procedure of asynchronous sequential logic circuits	J.-W. Kang	35th Midwest Symposium on Circuits and Systems	DOI: 10.1109/MWSCAS.1992.271274	1992
P22	Timing verification of sequential dynamic circuits	D. Van Campenhout	IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems	DOI: 10.1109/43.759081	1999 Volume: 18, Issue: 5
P23	Using VHDL Simulator to Estimate Logic Path Delays in Combinational and Embedded Sequential Circuits	M.L.J. Sokolovic	EUROCON 2005 - The International Conference on "Computer as a Tool"	DOI: 10.1109/EURCON.2005.1630296	Year: 2005 Volume: 2
P24	A noise test structure for CMOS logic families	M. Graziano	ICM'99. Proceedings. Eleventh International Conference on Microelectronics (IEEE Cat. No.99EX388)	DOI: 10.1109/ICM.2000.884813	2000
P25	A novel high-speed BiCMOS domino logic families of	S.M. Menon	ISCAS'95 - International Symposium on	DOI: 10.1109/ISCAS.1995.521441	1995 Volume: 1
P26	A low-voltage low-noise CMOS digital family	R.M. Secareanu	15th Annual IEEE International ASIC/SOC Conference	DOI: 10.1109/ASIC.2002.1158056	2002
P27	Use of programmable logic devices as an aid to system design	T.C. Mace	IEE Colloquium on Programmable Logic Devices for Digital Systems Implementation		1990



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P28	A Novel Overlap-Based Logic Cell: An Efficient Implementation of Flip-Flops With Embedded Logic	Omid Sarbishei	IEEE Transactions on Very Large Scale Integration (VLSI) Systems	DOI: 10.1109/TVLSI.2008.2009453	2010 Volume: 18 , Issue: 2
P29	Design of CMOS dynamic logic circuits to improve noise immunity	Ulka M. Bokare	International Conference on Communication and Signal Processing (ICCSP)	DOI: 10.1109/ICCSP.2017.8286740	2017
P30	Arithmetic functions in programmable logic	WESCON '94		DOI: 10.1109/WESCON.1994.403537	1994


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JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING & MANAGEMENT
 Department of Electronics & Telecommunication Engineering
 "Rectifying Ideas, Amplifying Knowledge"
 Session 2019-20 (Even Semester)
Teaching Plan

NAME OF THE TEACHER Mr. Shailesh M. Sakhare

SUBJECT: Numerical Methods & Computer Programming

YEAR/SEMESTER 2nd/4th

SUBJECT CODE BTBSC406

SECTION: A

Sr. No.	Lec. No.	Topic Code	Contents to be Covered	Planned Teaching Dates/ Days	Text Book (Page no)	Reference Book (Page no)	URL's (NPTEL/OnlineMaterial/PPT/Video)	Applications (R&D/ Industry)	Learning Outcomes
UNIT-I: INTRODUCTION TO COMPUTATIONAL METHODS & ERRORS									
1	1	1.1	General principles, common ideas and concepts of computational techniques.	Day 1	R4 (2-12)		https://nptel.ac.in/course/s/122102009/	C1 to C11 P1 to P27	Students will be able to demonstrate significance of Numerical methods
2		1.2	Various computational techniques.				https://nptel.ac.in/course/s/122102009/		
3	2	2.1	Errors: Types and sources of errors	Day 2	R5 (43-60)		https://nptel.ac.in/course/s/122102009/		Students will be able to differentiate between Normal algebraic and Computer mathematics
4		2.2	Concept in error estimation and Error propagation				https://nptel.ac.in/course/s/122102009/		
5	3	3.1	Error due to floating point	Day 3	R5 (34-39)		https://nptel.ac.in/course/s/122106033/		Students will be able to justify storage requirements of digital data and its limitations
6		3.2	Representation of errors, Elementary uses of series in calculation of errors				https://nptel.ac.in/course/s/122106033/		

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UNIT-II: SOLUTION OF TRANSCENDENTAL/EQUATIONS & SYSTEM OF LINEAR EQUATION

7	4	4.1	Finding root of polynomial equations deploying computational method Bisection.	Day 4	R1 (21-24), R4 (20-22), R2 (48-53)	https://nptel.ac.in/course/s/122106033/21	C1 to C11 P1 to P27	Students will be able to find nearest approximate root for given polynomial equations
8	5	5.1	Finding root of polynomial equations deploying computational method Regula-falsi	Day 5	R1 (24-26), R4 (24-25), R2 (73-74)	https://nptel.ac.in/course/s/122106033/21		Find nearest approximate root along with comparison with bisection method based on speed
9	6	6.1	Finding root of polynomial equations deploying computational method Newton-Raphson	Day 6	R1 (33-37), R4 (26-29), R2 (66-73)	https://nptel.ac.in/course/s/122106033/22		Find nearest approximate root along with comparison with various other method based on speed
10	7	7.1	Finding root of polynomial equations deploying computational method Secant	Day 7	R1 (43-44), R4 (22-23), R3 (125-138)	https://nptel.ac.in/course/s/122106033/22		Find nearest approximate root along with comparison with various other method based on speed
11	8	8.1	Finding root of polynomial equations deploying computational method Successive approximation.	Day 8	R1 (26-32)	https://nptel.ac.in/course/s/122106033/23		Find nearest approximate root along with comparison with various other method based on speed
12	9	9.1	Solving linear equations deploying computational method Gauss elimination & Gauss Jordan	Day 9	R1 (257-265), R4 (114-120), R2 (357-368)	https://nptel.ac.in/course/s/111101003/17		Students will be able to find solution of set of linear equations and give comparison of various methods used for it.

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13	10	10.1	Solving linear equations deploying computational method Partial pivoting & Matrix triangularisation (LU decomposition)	Day 10	R1 (265-270), R1 (259-260), R4 (120-127)	https://nptel.ac.in/course/s/111101003/20 , https://nptel.ac.in/course/s/111101003/18	Students will be able to find solution of set of linear equations and give comparison of various methods used for it.
14	11	11.1	Solving linear equations deploying computational method Cholesky	Day 11	R4 (127-131), R3 (325-326)	https://nptel.ac.in/course/s/111101003/19	Students will be able to find solution of set of linear equations and give comparison of various methods used for it.
15	12	12.1	Solving linear equations deploying computational method Gauss Seidel and Jacobi methods.	Day 12	R4 (147-152), R5 (303-310)	https://nptel.ac.in/course/s/111101003/29 , https://nptel.ac.in/course/s/111101003/28 , https://nptel.ac.in/course/s/111107105/4	Students will be able to find solution of set of linear equations and give comparison of various methods used for it.
UNIT-III: INTERPOLATION & POLYNOMIAL APPROXIMATION							
16	13	13.1	Least square approximation	Day 13	R1 (146-150), R3 (520-524), R5 (178-185)	https://nptel.ac.in/course/s/122102009/30 , https://nptel.ac.in/course/s/122102009/31	Students will be able to demonstrate understanding of approximations
17		13.2	Orthogonal polynomials & Chebyshev polynomials		R1 (151-154), R1 (178-182), R2 (498-506), R2 (507-516),	https://nptel.ac.in/course/s/122102009/31 , https://nptel.ac.in/course/s/122102009/33	
18	14	14.1	Finite difference operator and their relations, Forward, backward, central and divided difference	Day 14	R1 (65-72), R4 (229-235), R2 (122-130), R1 (100-105)	https://nptel.ac.in/course/s/111107105/17 , https://nptel.ac.in/course/s/122102009/27 , https://nptel.ac.in/course/s/111106101/5 , https://nptel.ac.in/course/s/111106101/6	Students will be able to fit the data in a given set.
19	15	15.1	Newton's forward divided difference, Backward difference interpolation	Day 15	R1 (73-82), R4 (235-237), R1(100-105), R2 (122-130)	https://nptel.ac.in/course/s/111107105/18 , https://nptel.ac.in/course/s/111106101/4	C1 to C11 P1 to P27 Students will be able to fit the data in a given set and find the generated error in calculation.

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20	16	16.1	Stirling interpolation	Day 16	R4 (237-242), R2 (129-130), R6 (241)	
21	17	17.1	Lagrange's interpolation polynomials	Day 17	R1 (91-97)	https://nptel.ac.in/course/s/111107105/22 https://nptel.ac.in/course/s/111106101/7
22	18	18.1	Spline interpolation	Day 18	R1 (108-121), R4(260-271)	https://nptel.ac.in/course/s/122106033/12

Students will be able to construct a polynomial which fit the data in a given set.

Students will be able to demonstrate its complexity compared to other methods

Students will be able to demonstrate piecewise linear interpolation and its drawback.

UNIT-IV: NUMERICAL INTEGRATION & DIFFERENTIATION

23	19	19.1	Methods based on interpolation such as Trapezoidal rule	Day 19	R1 (198-200), R4 (350-352)	https://nptel.ac.in/course/s/111107105/32
24	20	20.1	Simsons 1/3 and 3/8 rules	Day 20	R1 (200-201)	https://nptel.ac.in/course/s/111107105/33 https://nptel.ac.in/course/s/111107105/34
25	21	21.1	Euler's method, Modified Euler's method	Day 21	R1 (300-304)	https://nptel.ac.in/course/s/111107105/37 https://nptel.ac.in/course/s/111107105/38
26	22	22.1	Runge Kutta 2nd and 4th order	Day 22	R1 (304-308)	https://nptel.ac.in/course/s/111107105/39

Students will be able to estimate the area beneath a curve

Students will be able to apply it in integration where integrand may have some unexpected behavior

Students will be able to find approximate values of the solutions to the initial-value problem

Students will demonstrate imitation of Taylor series method without requiring analytical differentiation of the original differential equation.

C1 to C11
P1 to P27

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27	23	23.1	Taylor's series & Stability analysis of various integration and differentiation methods	Day 23	R1 (296-298)	https://nptel.ac.in/courses/111107105/38	Students will be able to compare various methods based on their complexity
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UNIT-V: OBJECT ORIENTED PROGRAMMING

28	24	24.1	Basic concepts of object oriented programming	Day 24	R8 (6-12)	https://nptel.ac.in/courses/106105151/19	Students will understand significance of OOP concepts
29		24.2	Benefits of OOP, Object oriented languages, Applications of OOP				
30	25	25.1	Basic data types, User defined data types, Symbolic constants, Declaration of variables	Day 25	R8 (22-26)		Students will be able to identify correct use of variable while dealing with data
31	26	26.1	Dynamic initialization of variables, Reference variables	Day 26	R9 (185-188)	https://nptel.ac.in/courses/106105151/17 , https://nptel.ac.in/courses/106105151/18	Students will be able to justify storage requirement of data
32	27	27.1	Scope resolution operator & Type cast operator	Day 27	R9 (236), R9 (58-60)	https://nptel.ac.in/courses/106105151/47 , https://nptel.ac.in/courses/106105151/48 , https://nptel.ac.in/courses/106105151/49	Students will be able to demonstrate casting requirement
33	28	28.1	Function prototyping & Inline functions	Day 28	R8 (20, 54), R9 (195-197), R8 (77-80)	https://nptel.ac.in/courses/106105151/8 , https://nptel.ac.in/courses/106105151/9	Students will be able to efficiently code critical time parameter in programming
34	29	29.1	Function overloading	Day 29	R8 (55-65), R9 (188-193)	https://nptel.ac.in/courses/106105151/12 , https://nptel.ac.in/courses/106105151/13 , https://nptel.ac.in/courses/106105151/14	Students will be able to model various data types and related functionalities efficiently.

C1 to C12
P16

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35	30	30.1	Friend and virtual functions	Day 30	R8(475-485), R8 (321-345), R9 (520-528), R9 (504-513)	https://nptel.ac.in/course/s/106105151/32
36	31	31.1	Specifying a class, Defining members, C++ program with class	Day 31	R7 (90-94)	
37	32	32.1	Constructors, Multiple constructor in class	Day 32	R8 (93-95, 187-192), R9 (227-231)	s/106105151/23 , https://nptel.ac.in/course/s/106105151/24 , https://nptel.ac.in/course/s/106105151/25 , https://nptel.ac.in/course/s/106105151/26
38	33	33.1	Dynamic initialization of objects	Day 33	R9 (458-462), R8 (122-126)	https://nptel.ac.in/course/s/106105151/17 , https://nptel.ac.in/course/s/106105151/18
39		33.2	Dynamic constructor, Destructors.			

Students will be able to use nonmember function with class using friend and demonstrate run time polymorphism through virtual function

Students will be able to provide data security and understand data hiding.

Students will be able to provide default initial values to object associated members

Students will be able to demonstrate allocation and deallocation of memory efficiently

UNIT-VI: OPERATOR OVERLOADING & TYPE CONVERSIONS

40	34	34.1	Defining operator overloading, Rules for overloading operators	Day 34	R8 (68-77)	
41	35	35.1	Overloading binary operators	Day 35	R9 (328-332)	https://nptel.ac.in/course/s/106105151/15 , https://nptel.ac.in/course/s/106105151/16
42	36	36.1	Overloading unary operators & Manipulation of strings operators	Day 36	R9 (320-328, 332-341)	
43	37	37.1	Defining derived classes, Single inheritance, multilevel inheritance	Day 37	R9 (373-375)	https://nptel.ac.in/course/s/106105151/36 , https://nptel.ac.in/course/s/106105151/37 , https://nptel.ac.in/course/s/106105151/38

Students will be able to justify use of operators for nonstandard data items

Students will be able to develop smart classes using inheritance concept.

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44	38	38.1	Multiple, Hierarchical & Hybrid inheritance	Day 38	R7 (518-527)	s/106105151/38 https://nptel.ac.in/course/s/106105151/39 https://nptel.ac.in/course/s/106105151/50 https://nptel.ac.in/course/s/106105151/51 https://nptel.ac.in/course/s/106105151/40	C1 to C12 P16	Students will be able to model practical world problems with extension of classes
45	39	39.1	Virtual Functions and Polymorphism, pure virtual functions	Day 39	R8 (321-329)	https://nptel.ac.in/course/s/106105151/42 https://nptel.ac.in/course/s/106105151/43		Students will be able to use pointers of base class efficiently in programming
46	40	40.1	Virtual base classes, Abstract classes	Day 40	R8 (357-361, 329), R9 (518-520, 510-511)	https://nptel.ac.in/course/s/106105151/44 https://nptel.ac.in/course/s/106105151/45 https://nptel.ac.in/course/s/106105151/46		Students will be able to justify need of virtual base class
47	41	41.1	Managing Console I/O Operations, C++ Stream Classes	Day 41	R9 (568-577)			Students will learn how to manage input and visual effects with console
48	42	42.1	Unformatted I/O Operations, Managing output with manipulators.	Day 42	R9 (568-577)			Students will learn how to use manipulators in programming

*T=Text Book; R= Reference Book; C= Company name; P= Research Paper

Total number of lectures as per syllabus: - 36

Total number of lectures as per planned: - 42

Final Outcome of the Subject (Maximum 6 Outcome):

On completion of the course, students will be able to

CO1.	solve algebraic and transcendental equations by using numerical techniques and will be able to compare different numerical techniques used for this purpose and also will be able to choose a proper one as per the requirement of the problem.
CO2.	solve a system of linear equations with any number of variables using different direct and iterative numerical techniques.
CO3.	Understand the concept of interpolation, finite difference operators and their relations, and can apply different interpolation techniques on equi-spaced or non equi-spaced data values.
CO4.	Prepare themselves to write computer programs for the numerical computational techniques.
CO5.	Understand application of the NMCP course in many engineering core subjects like signal processing, digital communication, numerical techniques in electromagnetics etc.
CO6.	Understand procedure-oriented and object oriented programming concepts and capable of writing C and C++ programs efficiently.

Text/Reference Books:

Code	Title of the Book	Author Name/Designatio	Publisher	Edition/ Publication Year
R1	Introductory Methods of Numerical Analysis	S. S. Sastry	Prentice Hall of India, Private Limited, 2008.	4th
R2	Numerical Analysis	R. L. Burden, J. D. Faires	Thomson Brooks/Cole	7th
R3	Numerical Mathematics and Computing	Ward Cheney, David Kincaid	Thomson Brooks/Cole	5th
R4	Numerical Methods	M. K. Jain, S. R. K. Iyengar, R. K. Jain	New Age International	5th
R5	Elementary Numerical Analysis	K. Atkinson, W. Han	Wiley India	3rd
R6	Numerical Methods	P. Kandasamy, K. Thilagavathy, K. Gunavathi	S. Chand & Company Limited	1st
R7	Object-Oriented Programming with C++	E. Balagurusamy	Tata McGraw Hill	2nd
R8	Let us C++	Yeshwant Kanetkar	BPB	4th
R9	Object-Oriented Programming in C++	Robert Lafore	Techmedia	4th

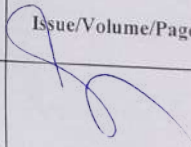
Company/Industry:

Code	Company/Industry Name	Website	Detailed Information
C1	Bosch	www.bosch.in	Bosch is a leading supplier of technology and services in the areas of Mobility solutions, industrial technology, consumer goods and energy and building technology.
C2	Mathworks	www.mathworks.com	It is the leading developer of mathematical computing software for engineers and scientists. Analyze data, develop algorithms and create mathematical model
C3	Indian Space Research Organization	www.isro.gov.in	Harness space technology for national development, while pursuing space science research and planetary exploration. Designs and develops of launch vehicles and satellites and related technologies.

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C4	Defence Researc & Development Organization	www.drdo.gov.in	Designs, develops and lead to production statr-of-the-art sensors, weapon systems,platforms and allied equipment for defence services in India. Provides technology solutions to the servicesand build strong indigenous technology base.
C5	Hindustan Aeronautics Limited	www.hal-india.co.in	It is a significant global player in the aerospace industry. Achievs self reliance in design, development, manufacture, upgradeand maintenance of aerospace equipment diversifying into related areas.
C6	Mahindra Aerospace	www.mahindraaerospace.com	Manufactures a utility and versatile aircraft in its class.
C7	RajHamsa Ultralight Pvt. Ltd.	www.x-air.in	Manufactures Ultralight aircrafts.
C8	Arrow Electronics India Pvt. Ltd.	www.arrow.com	Arrow electronics guides innovation forward for leading technology manufacturers and service providers. Develops technology solutions that improve business and daily life
C9	Qualcomm	www.qualcomm.com	Invent mobile technology breakthroughs.
C10	Bharat Electronics Ltd.	www.bel-india.in	Indian state owned aerospace and defence company. Manufactures advanced electronic produts for the indian armed forces.
C11	Bharat Heavy Electricals Ltd.	www.bhel.com	BHEL is one of the largeat engineering and manufacturing company , engaged in design, engineering, construction, testing, commissioning and servicing of a wide range of products and services in the field of power, transmission, renewables, transportation, water etc.
C12	Infosys, Capgemini, IBM, Google etc. (IT Companies)	www.infosys.com www.capgemini.com	Global leader in next generation digital transformation, technology services and consulting.

Research Paper:

Code	Title of the Paper	First Author Name	Journal/Conference Name	DOI no.	Issue/Volume/Page no/Year
P1	Implementation of numerical method for solving electrostatic problem	Dmitry I. Volkhin	15th International Conference of Young Specialists on Micro/Nanotechnologies and Electron Devices (EDM)	DOI: 10.1109/EDM.2014.6882491	 Principa 2014 D. College of Engineering & Management Khandala, Katol Road Nagpur-441501

P2	Study on Numerical Analysis Methods of EM Field and the Radiated Fields from ESD	Xu Xiaoying	Conference on Electronic Measurement and Instruments	10.1109/ICEMI.2007.4350541	2007
P3	Tabulation of Methods for the Numerical Solution of the Hollow Waveguide Problem (Short Papers)	Fook Loy Ng	IEEE Transactions on Microwave Theory and Techniques	10.1109/TMTT.1974.1128217	Volume: 22 , Issue: 3 , Mar 1974
P4	A numerical method for design of PI controllers	H. Panagopoulos	International Conference on Control	10.1109/CCA.1997.627612	1997
P5	Review of Numerical Methods for the Analysis of Arbitrarily-Shaped Microwave and Optical Dielectric Waveguides	S.M. Saad	IEEE Transactions on Microwave Theory and Techniques	10.1109/TMTT.1985.1133147	Volume: 33 , Issue: 10 , Oct 1985
P6	Performance evaluation of numerical methods for the Maxwell-Liouville equations	Michael Riesch	Conference on Numerical Simulation of Optoelectronic Devices (NUSOD)	10.1109/NUSOD.2017.8010072	2017
P7	On the complexity of numerical analysis	E. Allender	Conference on Computational Complexity	10.1109/CCC.2006.30	2006
P8	Numerical analysis of electromagnetic fields induced in the biological tissues by the new radio systems using ultrawide band (UWB)	A. Pradier	IEEE Antennas and Propagation Society International Symposium	10.1109/APS.2005.1551885	2005
P9	On Numerical Methods for Second Order PDE	Yi-Min Tian	International Conference on Information	10.1109/ICIE.2010.186	2010
P10	Numerical solution of partial differential equations with help of fuzzy transform	M. Stepnicka	International Conference on Fuzzy Systems,	10.1109/FUZZY.2005.1452549	2005

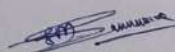
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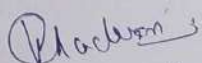
P11	Application of numerical methods in electromagnetic wave well-logging problems	Shen Xiaoyang	Antenna Technology and Applied Electromagnetics	Print ISBN: 978-0-9692563-1-1	1988
P12	Survey of numerical methods in field calculations	T. Tortschanoff	IEEE Transactions on Magnetics	10.1109/TMAG.1984.1063472	Volume: 20 , Issue: 5 , Sep 1984
P13	Numerical analysis and optimization of anechoic chambers for EMC testing	C. Bornkesse	on Electromagnetic Compatibility	10.1109/15.536082	Volume: 38 , Issue: 3 , Aug 1996
P14	Numerical methods for semiconductor device simulation	R.E. Bank	Transactions on Electron Devices	10.1109/T-ED.1983.21257	Volume: 30 , Issue: 9 , Sep 1983
P15	A Numerical Method Based on the Discretization of Maxwell Equations in Integral Form (Short Papers)	M. Albani	IEEE Transactions on Microwave Theory and Techniques	10.1109/TMTT.1974.1128246	Volume: 22 , Issue: 4 , Apr 1974
P16	Numerical Solution of Cloud Servicing Models	Vasil Georgiev	International Conference on Mathematics and Computers in Sciences and in Industry	10.1109/MCSI.2014.49	2014
P17	Numerical Methods for H2 Related Problems	E. Feron	American Control Conference	10.23919/ACC.1992.4792678	1992
P18	On the application of numerical methods to Hallen's equation	G. Fikioris	IEEE Transactions on Antennas and Propagation	10.1109/8.918612	Volume: 49 , Issue: 3 , Mar 2001
P19	Numerical solutions of fractional differential equations by using fractional Taylor basis	Vidhya Saraswathy	IEEE/CAA Journal of Automatica Sinica	10.1109/JAS.2017.7510337	Volume: 4 , Issue: 1 , Jan. 2017
P20	Visual Teaching of Numerical Analysis Based on MATLAB	Yu Bai	First International Conference on Information Science and Engineering	10.1109/ICISE.2009.1341	2009


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P21	Numerical Methods for Solving the Optimal Problem of Contrast Enhancement	Jian Yang	TRANSACTIONS ON GEOSCIENCE AND REMOTE		VOL. 38, NO. 2, MARCH 2000
P22	A high-order numerical algorithm for two-dimensional time-space tempered fractional diffusion-wave equation	Hengfei Ding	Elsevier Journal Applied Numerical Mathematics	https://doi.org/10.1016/j.apnum.2018.08.005	Volume 135, January 2019, Pages 30-46
P23	L2(H1 γ)Finite Element Convergence for Degenerate Isotropic Hamilton-Jacobi-Bellman Equations	Annalisa Buffa	IMA Journal of Numerical Analysis	10.1093/imanum/drw035	Volume: 37, Issue: 3, July 2017
P24	Refinable spaces and local approximation estimates for hierarchical splines	Annalisa Buffa	IMA Journal of Numerical Analysis	10.1093/imanum/drw055	Volume: 37, Issue: 3, July 2017
P25	Fast and accurate computation of Chebyshev coefficients in the complex plane	Haiyong Wang	IMA Journal of Numerical Analysis	10.1093/imanum/drw039	Volume: 37, Issue: 3, July 2017
P26	On the numerical stability of the second barycentric formula for trigonometric interpolation in shifted equispaced points	Anthony P. Austin	IMA Journal of Numerical Analysis	10.1093/imanum/drw038	Volume: 37, Issue: 3, July 2017
P27	Convergence rates of finite difference schemes for the linear advection and wave equation with rough coefficient	Franziska Weber	IMA Journal of Numerical Analysis	10.1093/imanum/drw046	Volume: 37, Issue: 3, July 2017


Prof. Shailesh M. Sakhare
Subject Incharge


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 Department of Electronics /Electronics & Telecommunication Engineering
 “Rectifying Ideas, Amplifying Knowledge”
 Session 2019-20 (Odd Semester)
Teaching Plan

NAME OF THE TEACHER Mr. Shailesh M. Sakhare

SUBJECT: Control System Engineering

YEAR/SEMESTER 3rd/5th

SUBJECT CODE BTEX502

SECTION: A/B

Sr. No.	Lec. No.	Topic Code	Contents to be covered	Proposed Teaching Dates	Actual Teaching Dates	Text Book Pg No.	Ref. Book Pg No.	URL's (NPTEL/OnlineMaterial/PPT/Video)	Applications (R&D/ Industry)	Learning Outcomes
UNIT-1. Introduction to Control Problem										
1	1	1.1	Industrial Control examples	Day-1		T1 (2-16)		https://nptel.ac.in/courses/108106098/1		Students will be able to understand the real time examples of control system engineering in an industry.
2	2	1.2	Mathematical models of physical systems	Day-2		T1 (22-41)		https://nptel.ac.in/courses/108106098/2		Students will be able to understand the Mathematical modelling of physical systems
3	3	1.3	Control hardware and their models	Day-3		T5(2-26)		https://nptel.ac.in/courses/108106098/3		
4	4	1.4	Transfer function models of linear time-invariant systems	Day-4		T6 (24-29) T5(2-1 to 2-54)		https://nptel.ac.in/courses/108106098/4		Students will be able to understand the concept of transfer function and its applications.
5	5	1.5	Feedback Control: Open-Loop and Closed-loop systems	Day-5		T6 (12-21) T5 (1-3)		https://youtu.be/SUxVuGnF7wl		Students will be able to understand the concept and benefits of feedback. Also differentiate between open loop and closed loop systems.
6	6	1.6	Benefits of Feedback	Day-6		T1 (92-93)		https://youtu.be/SUxVuGnF7wl		
7	7	1.7	Block diagram reduction techniques	Day-7		T1 (54-62) T5(3-1)		https://nptel.ac.in/courses/108106098/10		Students will be able to solve various problems on block diagram reduction.

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8	8	1.8	Signal flow graph analysis	Day-8	T1 (62-72) T5 (4-1)	https://nptel.ac.in/courses/108106098/10	Students will be able to understand the importance and applications of SFG in control system
UNIT-2. Time Response Analysis							
9	9	2.1	Standard test signals	Day-9	T1 (195-196)	https://youtu.be/ziU1OTwUrbw	Students will be able to understand and differentiate between various standard test signals.
10	10	2.2	Time response of first and second order systems for standard test inputs	Day-10	T1 (197-199)	https://nptel.ac.in/courses/108106098/12	Students will be able to analyse Time response of first and second order systems for standard test inputs
11	11	2.3	Application of initial and final value theorem	Day-11	T5 (22-23)	https://youtu.be/T2k8e93GpUA	Students will be able to apply these theorems
12	12	2.4	Design specifications for second-order systems based on the time-	Day-12	T1 (215-220)	https://nptel.ac.in/courses/107106081/19	Students will be able to design second order system based on time response
UNIT-3. Stability Analysis							
13	13	3.1	Concept of Stability	Day-13	T1 (270-276) T5 (6-1 to 6-57)	https://nptel.ac.in/courses/108106098/15	Students will be able to understand the concept and applications of stability.
14	14	3.2	Routh-Hurwitz Criteria	Day-14	T1 (277-280) T5 (6-1 to 6-57)	https://nptel.ac.in/courses/108106098/16	Students will be able to apply Routh-Hurwitz Criteria to control system problems.
15	15	3.3	Relative Stability analysis	Day-15	T1 (287-289)	https://nptel.ac.in/courses/108106098/16	Students will be able to understand and differentiate between stability and relative stability.
16	16	3.4	Root Locus technique	Day-16	T1 (298-301)	https://nptel.ac.in/courses/108106098/19	Students will be able to construct Root Locus
17	17	3.5	Construction of Root-loci	Day-17	T5 (7-1 to 7-8)	https://nptel.ac.in/courses/108106098/20	

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18	18	3.6	Dominant Poles	Day-18	T1 (302-326)	https://nptel.ac.in/courses/108106098/20	Students will be able to understand the concept of dominant poles
19	19	3.7	Application of Root Locus Diagram	Day-19	T6 (414-436)	https://nptel.ac.in/courses/108106098/20	Students will be able to understand the applications of root locus diagram and will apply accordingly to control
UNIT-4. Frequency-Response Analysis							
20	20	4.1	Relationship between time and frequency response	Day-20	T1 (347-352)	https://youtu.be/pTTTTOuUps7I	Students will be able to compare time and frequency response
21	21	4.2	Polar plots	Day-21	T1 (352-355) T5 (10-1)	https://nptel.ac.in/courses/108101037/41	Students will be able to solve problems on polar plot.
22	22	4.3	Bode plots	Day-22	T1 (355-365) T5 (9-1)	https://nptel.ac.in/courses/108101037/41	Students will be able to construct Bode Plots
23	23	4.4	Nyquist stability criterion	Day-23	T1 (361-364)	https://nptel.ac.in/courses/108101037/49	Students will be able to apply Nyquist stability criterion to control system problems
24	24	4.5	Relative stability using Nyquist criterion – gain and phase margin	Day-24	T1 (394-408)	https://nptel.ac.in/courses/107106081/63	Students will be able to find relative stability of a system using Nyquist stability
25	25	4.6	Closed-loop frequency response	Day-25	T1 (409-416)	https://nptel.ac.in/courses/107106081/47	Students will be able to find Closed-loop frequency response
UNIT-5. Introduction to Controller Design							
26	26	5.1	Stability, steady-state accuracy	Day-26	T5 (6-1 to 6-5)	https://nptel.ac.in/courses/102103056/10 https://nptel.ac.in/courses/102103056/11	Students will be able to understand Stability, steady-state accuracy
27	27	5.2	Transient accuracy	Day-27	T5 (6-1 to 6-5)	https://youtu.be/zIU1OTwUrbw	Students will be able to understand Transient accuracy

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28	28	5.3	Disturbance rejection	Day-28			https://youtu.be/ziu1OTwUrbw	Students will be able to understand Disturbance rejection
29	29	5.4	Insensitivity and Robustness of control systems	Day-29			https://youtu.be/cZQdZ8cs37o	Students will be able to understand Insensitivity and Robustness of control systems
30	30	5.5	Application of Proportional, Integral and Derivative Controllers	Day-30	TS (12-1 to 12-2)		https://youtu.be/VC1l1cd4Sh4	Students will be able to Design PI, PD and PID controllers.
31	31	5.6	Designing of Lag and Lead Compensator using Root Locus and Bode Plot	Day-31	TS (11-1 to 11-64)		https://nptel.ac.in/courses/107106081/71	Students will be able to Design Lag and Lead Compensator using Root Locus and Bode Plot

UNIT-6. State Variable Analysis

32	32	6.1	Concepts of state variables, State space model	Day-32	T1 (571-578) TS (13-2)		https://nptel.ac.in/courses/108106098/48	Students will be able to apply the Concepts of state variables, State space model
			Diagonalization of State matrix	Day-33	TS (13-3) to 13-32)		https://nptel.ac.in/courses/108106098/49	Students will be able to understand the importance of Diagonalization of State matrix
34	34	6.3	Solution of state equations	Day-34	TS (13-36)		https://nptel.ac.in/courses/108103008/28	Students will be able to solve state equations
35	35	6.4	Eigenvalues and Stability Analysis	Day-35	TS (13-31)		https://youtu.be/GAOjfd5QJZE	Students will be able to perform stability analysis
36	36	6.5	Concept of controllability and observability	Day-36	TS (13-44)		https://nptel.ac.in/courses/108103008/29	Students will be able to understand the Concept of controllability and observability
37	37	6.6	Pole-placement by state feedback	Day-37			https://nptel.ac.in/courses/108103008/30	Students will be able to understand the Pole-placement by state feedback

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38	38	6.7	Discrete-time system	Day-38			https://youtu.be/WXwQ_fb7NEk	Students will be able to design discrete time system
39	39	6.8	Difference Equations	Day-39			https://youtu.be/XMfH2P2Fc6Q?list=PLWPrh4EWFpGpH_Rb6Q4iQ6vGGRA6MORZ	Students will be able to solve difference equations
40	40	6.9	State-space models of linear discrete-time systems	Day-40			https://youtu.be/fiqj_vUxMXc	Students will be able to design State-space models of linear discrete-time systems
41	41	6.10	Stability of linear discrete time systems.	Day-41			https://youtu.be/355_xmz82-4	Students will be able to find out Stability of linear discrete time systems.

*T= Text Book; R= Reference Book; C= Company name; P= Research Paper

Total number of lectures as per syllabus: - 36

Total number of lectures as per planned: - 41

Final Outcome of the Subject (Maximum 6 Outcome):

On completion of the course, students will be able to

CO1.	Define the fundamentals of (feedback) control systems.
CO2.	Derive the transfer function of a system from the mathematical model of a system.
CO3.	Derive the transfer function of a system from the state variable model.
CO4.	Establish the relationship between the time-domain and frequency-domain responses of control systems.
CO6.	Design simple feedback controllers.

Text/Reference Books:


Code	Title of the Book	Author Name/Designation/ Organization	Publisher	Edition/ Publication Year
11	Control System Engineering	U. J. Nigam et al	New Age International Publishers	1st/2017
12	Control Systems: Principles and Design	M. Gopal	Tata McGraw Hill	7th/2012
13	Control Systems	Smarajit Ghosh	Pearson Education	Principal Second
14	Automatic control systems (With Matlab)	S. Hasan Saeed	S. K. Kataria & Sons	Revised/2008
15	Feedback Control System	R. A. Barapate	Tech-Max Publication	1st/2015

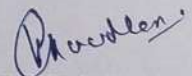
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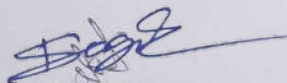
T6	Feedback Control System	U. A. Bakshi, V. U. Bakshi	Technical Publication	15th Reprint/2013
R1	Automatic control systems	Benjamin C. Kuo,	Prentice Hall India	Seventh/1995
R2	Control System Engineering	S.K. Bhattacharya	Pearson Education	Second/2008
R3	Modern Control Systems	Richard C. Dorf, Robert	Addison-Wisley	1999
R4	Feedback and Control Systems	Schaum's Outline Series	Tata McGraw Hill	2007

Company/Industry:

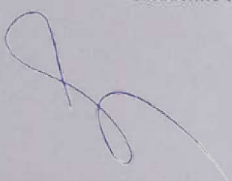
Code	Company/Industry Name	Website	Detailed Information
C1	Bosch	www.bosch.in	Bosch is a leading supplier of technology and services in the areas of Mobility
C2	Mathworks	www.mathworks.co	It is the leading developer of mathematical computing software for engineers and
C3	Indian Space Research	www.isro.gov.in	Harness space technology for national development, while pursuing space science
C4	Defence Researc &	www.drdo.gov.in	Designs, develops and lead to production state-of-the-art sensors, weapon
C5	Hindustan Aeronautics Limited	www.hal-india.co.in	It is a significant global player in the aerospace industry. Achieves self reliance in
C6	Mahindra Aerospace	www.mahindraaero	Manufactures a utility and versatile aircraft in its class.
C7	AMD	www.amd.com	Develops computer processors and related technologies like chipsets, Embedded and
C8	XILINX	www.xilinx.com	Primary supplier of Programmable logic devices.
C9	Qualcomm	www.qualcomm.co	Invent mobile technology breakthroughs.


Prof. Shailesh M. Sakhare
 Subject Teacher


Prof. V. P. Chaudhari
 Academic Incharge


Dr. R. Kshirsagar
 HOD (ETC)ment

HOD, Dept. of EN/ETC
JD College of Engineering
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 Nagpur-441103)



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J D COLLEGE OF ENGINEERING & MANAGEMENT, NAGPUR
 Department of Electronics Engineering/ Electronics & Telecommunication Engineering
Rectifying Ideas, Amplifying Knowledge"
 Session: 2019-20 (Even Semester)

Teaching Plan

Name of the Teacher : Prof. Avinash K. Ikhar
 Subject : Computer Network & Cloud Computing
 Year/Semester : 6th Semester (3rd Year)

Subject Code : BTETC602
 Section : ETC- A/B & EN

Sr. No	Lec. No	Topic Code	Contents to be Covered	Planned Teaching Dates	Text Books (Page no) Reference Book (Page no)	URL's (NPTEL/OnlineMaterial /PPT/Video)	Applications (R&D/ Industry)	Learning Outcomes
Unit I – Physical Layer								
1	1	1	Data Communications, Networks, Network types	Day 1	T1 (Pg: 3-30)	https://youtu.be/VDkYgGGtDnc	C1-C10	Able to understand Data Communications, Networks, Network types
2	2	2	Protocol layering, OSI model	Day 2	T1 (Pg: 31-40)	https://youtu.be/vv4y_uOneC0	C1-C10	Able to understand Protocol layering, OSI model
3	3	3	Layers in OSI model, TCP / IP protocol suite	Day 3	T1 (Pg: 40-50)	https://youtu.be/PpsEaqJV_A0	C1-C10	Able to understand Layers in OSI model, TCP / IP protocol suite
4	4	4	Addressing, Guided and Unguided Transmission media	Day 4	T1 (Pg: 185-204)	https://youtu.be/VDkYgGGtDnc	C1-C10	Able to understand Addressing, Guided and Unguided Transmission media
5	5	5	Switching: Circuit switched networks	Day 5	T1 (Pg: 207-221)	https://youtu.be/VDkYgGGtDnc	C1-C10	Able to understand Switching: Circuit switched networks
6	6	6	Packet Switching, Structure of a switch	Day 6	T1 (Pg: 221 - 232)	https://youtu.be/VDkYgGGtDnc	C1-C10	Able to understand Packet Switching, Structure of a switch
Unit II – Data Link Layer								
7	7	7	Introduction to Data Link Layer, DLC	Day 7	T1 (Pg: 237 -250 & 299 - 304)	https://youtu.be/JRgmPc00KWl	C1-C10	Able to understand Data Link Layer, DLC

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				Services, DLL protocols				Services, DLL protocols
8	8	8	HDLC, PPP	Day 8	T1 (Pg : 304 - 312)	https://youtu.be/TbRjVOLnwko https://youtu.be/2_plucQsLtU	C1-C10	Able to understand HDLC, PPP
9	9	9	Media Access Control: Random Access, Controlled Access, Channelization	Day 7	T1 (Pg : 325 - 348)	https://youtu.be/g32GA0YR26U https://youtu.be/390vtjHjuCU https://youtu.be/1_VWkgAH_AY https://youtu.be/qdhZBxbFZTo	C1-C10	Able to understand Media Access Control: Random Access, Controlled Access, Channelization
10	10	10	Wired LAN: Ethernet Protocol, Standard Ethernet	Day 8	T1 (Pg : 362 - 363)	https://youtu.be/CPWVT8Zs4I4	C1-C10	Able to understand Wired LAN: Ethernet Protocol, Standard Ethernet
11	11	11	Fast Ethernet, Giagabit Ethernet, 10 Gigabit Ethernet	Day 9	T1 (Pg : 364- 383)	https://youtu.be/3p-geaqqUZA	C1-C10	Able to understand Fast Ethernet, Giagabit Ethernet, 10 Gigabit Ethernet
Unit III - Wireless LANS & Virtual Circuit Networks								
12	12	12	Introduction, Wireless LANS	Day 10	T1 (Pg : 435 - 439)	https://youtu.be/CAGr5MYIW1I?list=PLFsFv9wvnmMUwmPOyymwRxqcyiNu4soTB	C1-C10	Able to understand Wireless LANS
13	13	13	IEEE 802.11 project	Day 11	T1 (Pg : 440 - 446)	https://youtu.be/-TfYiluYNMo	C1-C10	Able to describe IEEE 802.11 project
14	14	14	Bluetooth	Day 12	T1 (Pg : 451 - 457)	https://youtu.be/FWjddwcpYw8	C1-C10	Able to understand Bluetooth
15	15	15	Zigbee	Day 13	T1 (Pg : -)	https://youtu.be/vt1TTd5CnE	C1-C10	Able to understand Zigbee
16	16	16	Connecting devices	Day 14	T1 (Pg : 493 - 500)	https://youtu.be/hIKWCQ-B28-hubs https://youtu.be/puFFREFAWIo-bridges https://youtu.be/7U_WwCVyW_Y-routers	C1-C10	Able to understand Connecting devices
17	17	17	Virtual LANS	Day 15	T1 (Pg : 502 - 506)		C1-C10	Able to understand Virtual LANS

Unit IV - Network Layer

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18	18	18	Switching, Logical addressing - IPV4	Day 16	T1 (Pg : 516-538)	https://youtu.be/zMn1leEMk8E - switching https://youtu.be/ybl-HrXOUps - ipv4 https://youtu.be/1Kwbo23RLGQ - classfull addressing	C1-C10	Able to understand Switching, Logical addressing - IPV4	
19	19	19	IPV6	Day 17	T1 (Pg :666, 674 - 678)	https://youtu.be/WdxCa3W11XQ	C1-C10	Able to understand IPV6	
20	20	20	Address mapping - ARP, RARP	Day 18	T1 (Pg :245 - 248)	https://youtu.be/EC1sXCT3bg - ARP https://youtu.be/gmitowolG7g - RARP	C1-C10	Able to understand Address mapping - ARP, RARP	
21	21	21	BOOTP and DHCP-Delivery	Day 19	T1 (Pg :539 - 543)	https://youtu.be/DQU2raqrRDE - BOOTP https://youtu.be/4pkDL1pgCgQ -DHCP	C1-C10	Able to understand BOOTP and DHCP-Delivery	
22	22	22	Forwarding and Unicast Routing protocols	Day 20	T1 (Pg :610 - 623)	https://youtu.be/xmiZUtpGfQw	C1-C10	Able to understand Forwarding and Unicast Routing protocols	
23	23	23	Routing Protocols	Day 21	T1 (Pg :598 -609)	https://youtu.be/LYE8Y-zDQa8	C1-C10	Able to understand Routing Protocols	
Unit V - Transport Layer									
24	24	24	Process to Process Communication, User Datagram Protocol (UDP)	Day 22	T1 (Pg : 693 -697) (Pg : 737 - 743)	https://youtu.be/blV7WUZpkCE	C1-C10	Able to understand Process to Process Communication, User Datagram Protocol (UDP)	
25	25	25	Transmission Control Protocol (TCP)	Day 23	T1 (Pg : 743 - 754)	https://youtu.be/uPHUzlBIOUE	C1-C10	Able to understand Transmission Control Protocol (TCP)	
26	26	26	SCTP Congestion Control	Day 24	T1 (Pg :777 - 786, 791)	https://youtu.be/9YBRN0TRHV0?list=TLPQMjkwMTlwMjBTs7NfqYEJ4A	C1-C10	Able to understand SCTP Congestion Control	
27	27	27	Quality of Service, QoS improving techniques	Day 25	T1 (Pg : 1054 - 1058)	https://youtu.be/SYopVj03O6U?list=TLPQMjkwMTlwMjBTs7NfqYEJ4A	C1-C10	Able to understand Quality of Service, QoS improving techniques	
28	28	28	Leaky Bucket	Day 26	T1 (Pg : 1058 - 1060)	https://youtu.be/eyH600YU9dw?list=TLPQMjkwMTlwMjBTs7NfqYEJ4A	C1-C10	Able to understand Leaky Bucket	

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29	29	29	Token Bucket algorithm	Day 27	T1 (Pg : 1060 - 1061)	https://youtu.be/1GJtQ1IfU_M?list=TLPQMjkwMTIwMjBTs7NfqYEJ4A	C1-C10	Able to understand Token Bucket algorithm
Unit VI - Application Layer								
30	30	30	Domain Name Space (DNS), DDNS	Day 28	T1 (Pg : 908- 921)	https://youtu.be/tBuoqbEEtZc?list=TLPQMjkwMTIwMjBTs7NfqYEJ4A - DNS https://youtu.be/rOLGvZagdC0?list=TLPQMjkwMTIwMjBTs7NfqYEJ4A - DDNS	C1-C10	Able to understand Domain Name Space (DNS), DDNS
31	31	31	TELNET, EMAIL	Day 29	T1 (Pg : 891 - 907)	https://youtu.be/d9MteBsGjG8?list=TLPQMjkwMTIwMjBTs7NfqYEJ4A - TELNET https://youtu.be/fn_perE5HiM?list=TLPQMjkwMTIwMjBTs7NfqYEJ4A - EMAIL	C1-C10	Able to understand TELNET, EMAIL
32	32	32	File Transfer Protocol (FTP), WWW	Day 30	T1 (Pg : 887 - 891)	https://youtu.be/Xm1SvFuDnw0?list=TLPQMjkwMTIwMjBTs7NfqYEJ4A	C1-G10	Able to understand File Transfer Protocol (FTP), WWW
33	33	33	HTTP, SNMP	Day 31	T1 (Pg : 876 - 887 934-938)	https://youtu.be/hExRDYZHhig - HTTP https://youtu.be/TI4bj1S66GA?list=TLPQMjkwMTIwMjBTs7NfqYEJ4A - HTTP https://youtu.be/tg47MZdtcAE?list=TLPQMjkwMTIwMjBTs7NfqYEJ4A	C1-C10	Able to understand HTTP, SNMP
34	34	34	Bluetooth	Day 32	T1 (Pg : 451 - 457)	https://youtu.be/u4L4GUmXHV8?list=TLPQMjkwMTIwMjBTs7NfqYEJ4A	C1-C10	Able to understand Bluetooth
35	35	35	Firewalls	Day 33	T1 (Pg : 907 -909)	https://youtu.be/kDEX1HXybrU?list=TLPQMjkwMTIwMjBTs7NfqYEJ4A	C1-C10	Able to understand Firewalls
36	36	36	Basic concepts of Cryptography	Day 34	T1 (Pg : 1076 - 1097)	https://youtu.be/5jpsMXt1Z9Y?list=TLPQMjkwMTIwMjBTs7NfqYEJ4A	C1-C10	Able to understand Basic concepts of Cryptography

*T=Text Book; R= Reference Book; C= Company name; R= Research Paper
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Total number of lectures as per syllabus: - 36

Total number of lectures as planned: - 36

Final Outcome of the Subject (Maximum 6 Outcome):

1. Understand the terminology and concepts of the OSI reference model and the TCP-IP reference model.
2. Analyze the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks and Remember the wireless networking concepts.
3. Understand the contemporary issues in networking technologies and Apply network tools and network programming.
4. Analyze a given requirement of wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs) and design it based on the market available component.
5. Apply the network programming for a given problem related TCP/IP protocol.
6. Create DNS DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.



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Text Books:

Code	Title of the Book	Author Name/Designation/ Organization	Publisher	Edition/ Publication Year
T1	Data Communication and Networking	Behrouz A. Forouzan	McGraw-Hill.	4th Edition
T2	Computer Networks	Andrew S. Tanenbaum	Pearson New International Edition	8th Edition
T3	Internetworking with TCP/IP	Douglas Comer	Prentice Hall of India	Volume 1, 6th Edition

Reference Books:

Code	Title of the Book	Author Name/Designation/ Organization	Publisher	Edition/ Publication Year
R1	TCP/IP Protocol Suite	Behrouz A. Forouzan	Tata McGraw-Hill	4th Edition
R2	Data and Computer Communication	William Stallings	Pearson Prentice Hall India	8th Edition
R3	TCP/IP Illustrated Addison-Wesley	United States of America	W. Richard Stevens	Volume 1

Company/Industry:

Code	Company/Industry Name	Website	Detailed Information
C1	CISCO	https://www.cisco.com	Len Bosack and his then-wife Sandy Lerner, both working for Stanford University wanted to send an email to one another from their offices but could not do so because of unavailable technology. As a result to overcome this network challenge they founded Cisco Systems in 1984. Cisco focuses on solving business challenges and provides network solutions to its clients to assure their business success. There are about 74,200 employees working at Cisco. Cisco has been one of the networking company among the top networking companies. Principal
C2	IBM India Pvt Ltd	https://www.ibm.com/in	Founded in the 1980s by Charles Ranlett Flint, IBM is one of the top networking companies. IBM is a Computer Technology and IT consulting company with its headquarters in New York, United States. IBM founded IBM

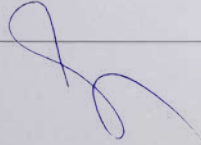
		-en/?ar=1	<p>India Private Limited in 1992. Karan Bajwa is the CEO of IBM India. This company has over 350,000 employees.</p> <p>IBM on Networking:</p> <ul style="list-style-type: none"> • Network services at IBM support your company in terms of agility, scalability, and security. • It provides guidance and knowledge using a life cycle approach which plans, designs, implements, assess and manages strategy.
C3	TATA Consultancy Services	https://www.tcs.com/	<p>TATA Consultancy Services is an Indian Multinational Company founded by JRD Tata and F.C Kohli in 1968. It is an Information Technology Service and Consulting Company headquartered in Mumbai, Maharashtra. TCS operates in 46 countries globally with total work strength of 417,929 employees. This company provides products and services including application development, consulting, business processing outsourcing, etc. TCS is one the top networking companies.</p> <p>TCS on Networking:</p> <ul style="list-style-type: none"> • TCS helps their clients to embrace new technologies and optimize transformation expenditure. • They offer end to end network services like network engineering, orchestration, network transformation, assurance, operation centers, etc. • They help clients maximize ROI and improve the quality of services delivered. • TCS also manages network infrastructure while providing the quality end-user experience
C4	Larsen and Toubro	http://www.larsentoubr o.com/	<p>Larsen and Toubro (L&T) is a Manufacturing, Construction, Engineering, Financial Services Indian Firm. Founded in 1938 by two Danish Engineers Henning Holck-Larsen & Soren Kristian Toubro taking refuge in India, this company is running with an employee strength of 10,04,027 employees and headquartered in Mumbai.</p> <p>Larsen and Toubro on Networking:</p> <p style="text-align: right;">Principal D. College of Engineering & Management Khandata, Katol Road Nagpur-441503</p>

			Larsen & Toubro Infotech(LTI), a subsidiary of Larsen and Toubro is a technology consultant and digital solutions firm operating in 27 countries. LTI has a team of 20,000 LTites. LTI operates across Digital platforms, Cloud IoT platforms, Analytics & Information Management Strategy, Mobile Services, Enterprise Integration, etc.
C5	Infosys Technologies	https://www.infosys.com/	<p>Infosys is the leader in next-generation digital services and Consulting. Founded on 7th July 1981 by seven engineers N. R. Narayana Murthy, Nandan Nilekani, S. Gopalakrishnan, S. D. Shibulal, K. Dinesh, N. S. Raghavan and Ashok Arora in Pune, started with an investment of \$250. In 1983, Infosys relocated to Bangalore, and it has been their head office since then. Infosys has 123 development centers and 82 marketing and sales offices across the globe. Infosys provides business consulting, information technology and outsourcing services. It has over 225,000 employees. Infosys is a dynamic company and one of the top networking companies.</p> <p>Infosys on Networking:</p> <ul style="list-style-type: none"> • Infosys focuses on AI to build automated roots for the enterprises that provide insights for executing change. • Digital transformation to provide business performance and customer delight. • Drive improvement by learning digital skills and knowledge.
C6	Wipro	https://www.wipro.com/en-IN/	<p>Wipro Limited is a leading IT, BPO and Consulting company. Mohammed Hashim Premji founded Wipro on 29th December 1945. Not all people know but Wipro is the abbreviation of Western India Vegetable Products Limited. Azimji Premji, son of Mohamed Premji, took over Wipro as its chairman in 1966.</p> <p>Wipro on Networking</p> <ul style="list-style-type: none"> • Wipro's network services believe in modernizing and rationalizing their networks to meet data demand. • Wipro provides end-to-end managed services for companies whose are consumers believe in using next-gen devices. • Their services include consulting, planning network strategies and

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
			auditing, customization, deployment, integration, testing, etc.
C7	TATA Communications	https://www.tatacommunications.com/	<p>TATA Communications started off as VSNL (Videsh Sanchar Nigam limited). Founded by The Government of India in 1986, TATA Communications has its headquarters in Mumbai and Singapore with over 8500+ employees across 38 countries. TATA Communications is now on BSE and NSE. Post divestment TATA acquired 45% shares of the company. TATA Group acquired VSNL in 2002 and then renamed the company to TATA Communications.</p> <p>TATA Communications on Networking:</p> <ul style="list-style-type: none"> • TATA Communications has a cloud driven networking solutions which help businesses boost across globes • They are a one-stop source for all communications and infrastructure needs • TATA Communications provide managed security services which protect user experience by minimizing the risk • They are equipping on connecting enterprises always with no barriers of networks
C8	Verizon	https://www.verizon.com/about/	<p>Verizon Communications is an American Multinational Company based out of New York City, United States. Founded on October 7 1983, Verizon's mission is to create a digital world by strengthening the ability of companies and humans.</p> <p>Verizon on Networking:</p> <ul style="list-style-type: none"> • Verizon provides technology that increases your agility to stay away from cyber threats and protect you seamlessly. • Verizon invests in networks for their products and services to meet customer demands in the future. • Verizon strives to deliver solutions that meet every day needs. <p style="text-align: right;">Principal</p>
C9	Bharti Airtel	https://www.airtel.in/	<p>Bharti Airtel Limited is an Indian Telecommunications Company, operating in about 16 countries including Asia and Africa. Bharti Airtel Limited's headquarters operate in Delhi, India. The CEO of Bharti Airtel is Mr. Gopal Vitthal. The company's Product</p>

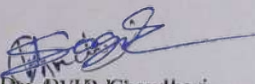
			<p>portfolio includes 2G, 3G, and 4G wireless services, fixed line services, home broadband. In the rest of the world, Bharti Airtel provides 2G, 3G, 4G wireless services. This company has over 413 million customers across its operations at the end of March 2018.</p> <p>Bharti Airtel on Networking:</p> <ul style="list-style-type: none"> • Bharti Airtel provides enterprises and government with connectivity, collaboration and communication solutions with business grade customer services • They dedicate the Service Provider Technologies to provides business solutions globally
C10	HCL	<p>https://www.hcltech.com/</p>	<p>HCL Technologies is a Next-Gen Global Technology Company that helps companies reconstruct their businesses according to the digital age. Their technology products, services, and engineering works on innovation. They possess a culture of invention and risk-taking along with a focus on customer relationships. HCL computes of 132,000+ 'Ideapreneurs' working in about 44 countries. HCL serves leading enterprises across key industries which include 250 companies of the Fortune 500 and 650 of the Global 2000 companies. HCL generated an estimated revenue of USD 8.4 billion in the year 2018. HCL Technologies has proved to be one of the top networking companies.</p> <p>HCL on Networking:</p> <ul style="list-style-type: none"> • HCL provides a portfolio of products, solutions, services, and IP through their Mode 1-2-3 strategy • Their product portfolio includes Digital, Internet Of Things, Automation Cloud, Analytics, Cyber Security, Infrastructure Management



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Research Paper:

Code	Title of the Paper	First Author Name	Journal/Conference Name	DOI no.	Issue/Volume/Page no/Year
P1	A Competitive Study of Cryptography Techniques over Block Cipher	Ashwak M. AL-Abiachi	UKSim 13th International Conference on Modelling and Simulation	DOI 10.1109/UKSIM.2011.85	978-0-7695-4376-5/11 \$26.00 © 2011 IEEE


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 DEPARTMENT OF ELECTRONICS & TELECOMMUNICATION ENGINEERING
 SESSION 2019-20

TEACHING PLAN

NAME OF THE TEACHER: NILESH A. MOHOTA

SUBJECT: Advanced Digital System Design
 YR/SEM: 4TH /7TH

SUBJECT CODE: BEETE704T
 SECTION: A

Sr. No.	Lec. No.	Topic Code	Contents to be Covered	Planned Teaching Dates	Text Book (Page no)	Reference Book (Page no)	URL's (NPTEL/OnlineMaterial/Pt/Video)	Applications (R&D/Industry)	Learning Outcomes
1	1	1.1	INTRODUCTION TO SUBJECT AND REVISION OF PREREQUISITE	DAY 1	T5 (6-7)		https://nptel.ac.in/courses/17108040/1.2		Students will understand system design requirements and related tools
2		1.2	DEVICE TECHNOLOGIES, SYSTEM REPRESENTATION			R4 (4-17)		P5, I29P18	
3		1.3	LEVELS OF ABSTRACTION, DEVELOPMENT TASKS AND EDA SOFTWARE.			R3 (2-3)		P2-4	
4	2	2.1	DEVELOPMENT FLOW.	DAY 2	T5 (1-6)	R3 (3-14) R4 (15-17)	https://nptel.ac.in/courses/106102181/2	P2-4, P18	Students will understand top down and bottom up approach of design and its realization with VHDL
5		2.2	HARDWARE DESCRIPTION LANGUAGE			R3 (14-17)	https://nptel.ac.in/courses/106102181/3	P2-4, P5, P9-A47	
6		2.3	VHDL IN DEVELOPMENT FLOW			R3 (17-21)			
7	3	3.1	BASIC VHDL CONCEPTS	DAY 3	T5 (9-30)				Students will learn basic constructs and syntax of HDL, and will get
8		3.2	SYNTAX OF VHDL PROGRAM				https://nptel.ac.in/courses/17108040/30	C1-C16, P9, P14	

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Sr. No.	Lec. No.	Topic Code	Contents to be Covered	Planned Teaching Dates	Text Book (Page no)	Reference Book (Page no)	URL's (NPTEL/OnlineMaterial/Pt/Video)	Applications (R&D/ Industry)	Learning Outcomes
9		3.3	ELEMENTS AND PROGRAM FORMAT				https://nptel.ac.in/courses/17108040/18		aquainted with software tool
10	4	4.1	DATA OBJECTS AND DATA TYPES	DAY 4	T1 (74-107) T5 (35-61)	R4 (140-151)	https://nptel.ac.in/courses/17108040/22	C1-C16, P14	Students will be able to map various input output requirements of digital system
11	5	5.1	OPERATORS	DAY 5	T5 (61-66)	R1 (70-71) R3 (186-193)	https://nptel.ac.in/courses/17108040/18_28	C1-C16, P14	Students will be able to use correct operators as per design requirement
12	6	6.1	COMBINATIONAL VERSUS SEQUENTIAL CIRCUITS.	DAY 6	R1 (44-56)	R2 (53-185) R3 (33-42, 52-62) R4 (162-226)	https://nptel.ac.in/courses/17108040/19	C1-C16, P15	Students will be able to classify design with memory and without memory.
13	7	7.1	SIGNAL ASSIGNMENT STATEMENTS: CONCURRENT SIGNAL ASSIGNMENT	DAY 7	T1 (5-7) T5 (103-107)	R3 (105-106)	https://nptel.ac.in/courses/17108040/3_4_24_26	C1-C16, P10	Students will be able to map intermediate inputs and outputs and simultaneous functions in design.
14		7.2	CONDITIONAL AND SELECTED SIGNAL ASSIGNMENT		T1 (16-19) T5 (114-116)	R3 (107-111)		C1-C16, P10	
15	8	8.1	FUNCTIONS	DAY 8	T1 (110-132) T5 (165-168)	R1 (72-74) R4 (380-408)		C1-C16, P10	Students will be able to model functionality based on some event
16	9	9.1	PROCEDURES	DAY 9	T1 (133-135) T5 (169-172)	R1 (74-76) R4 (408-413)		C1-C16, P10	Students will be able to efficiently model any expression with function

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Sr. No.	Lec. No.	Topic Code	Contents to be Covered	Planned Teaching Dates	Text Book (Page no)	Reference Book (Page no)	URL's (NPTEL/OnlineMaterial/Pt/Video)	Applications (R&D/ Industry)	Learning Outcomes
17	10	10.1	ATTRIBUTES	DAY 10	T1 (144-171)	R1 (264-268+G17) R3 (205-216) R4 (151-154)		C1-C16	Students will be able to decompose VHDL code into modules
18	11	11.1	GENERIC	DAY 11	T1 (29-31, 188-195) T5 (135-143)	R1 (280-281)		C1-C16, P8	Students will be able to analyze items used in system design
19	12	12.1	GENERATE STATEMENT	DAY 12	T1 (220-224) T5 (197-202)	R1 (282-283)		C1-C16, P8	Students will be able to map variable width input and output requirement of circuit design
20	13	13.1	PACKAGE	DAY 13	T1 (135-141) T5 (183-186)	R1 (76-77) R3 (144-150)		C1-C16, P8	Students will efficiently instantiate components in design
21	14	14.1	IEEE STANDARD LOGIC LIBRARY AND CONFIGURATION.	DAY 14	T1 (413-433)	R1 (276-280) R4 (296-313)		C1-C16	Students will be able to share declarations with several design units
22	15	15.1	TEST BENCH	DAY 15	T1 (330-348) T5 (240-251, 259-260)	R3 (65-67) R4 (227-228, 541-557)		C1-C16	Students will be able to access precompiled packages
23	16	16.1	COMPONENT DECLARATION AND INSTANTIATION.	DAY 16	T1 (436) T5 (126-132)	R3 (77-84)	https://nptel.ac.in/courses/17108040/32	C1-C16, P8+I63	Students will be able to apply all possible inputs to test the design performance
24	17	17.1	OVERVIEW OF FSM AND FSM REPRESENTATION.	DAY 17	T5 (282-284)	R3 (62-65) R4 (232-253)		C1-C16	Students will be able to model

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25	18	18.1	MOORE STATE MACHINE	DAY 18	T5 (288-290)	R3 (283-285)	https://nptel.ac.in/courses/17108040/7.9.10.11.12.13	C1-C16	Students will be able to model synchronous circuits through state machines
26	19	19.1	MELAY STATE MACHINE	DAY 19	T5 (290-292)	R3 (285-287) R4 (280-281)		C1-C16	Students will be able to optimize hardware through comparison of state machines
27	20	20.1	VHDL REPRESENTATION OF FSM	DAY 20	T5 (282-292)			C1-C16	Students will be able to analyse synchronous sequential design
28	21	21.1	STATE ASSIGNMENT AND DESIGN EXAMPLES	DAY 21	T5 (282-292)		https://nptel.ac.in/courses/17108040/31	C1-C16	Students will be able to write efficient code for FSM modelling and test its performance with software simulation
29	22	22.1	FSM BASED BINARY COUNTER	DAY 22	T5 (300-303)		https://nptel.ac.in/courses/17108040/7	C1-C16, P25	Students will be able to implement gained knowledge in design.
30	23	23.1	ASYNCHRONOUS SEQUENTIAL CIRCUIT ANALYSIS: FLOW TABLE	DAY 23		R6 (346-356)		C1-C16, P19, P20, P21	Students will be able to design Asynchronous circuit and will compare it with synchronous circuit
31		23.2	TRANSITION TABLE.						
32		23.3	PROBLEMS IN TRANSITION TABLE.						

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33	24	24.1	SYNTHESIS CONCEPT	DAY 24	T1 (243-272)	R1 (283-295) R2 (26-30, 32-47) R4 (416-422)		C1-C16, P6	Students will learn the design flow and will be able to use generalized hardware for circuit implementation
34	25	25.1	TIMING ANALYSIS OF LOGIC CIRCUITS.	DAY 25	T1 (238)	R2 (322-331)	https://nptel.ac.in/courses/106102181/1	C1-C16, P1, P22, P23	Students will be able to use analyser and compiler effectively.
35	26	26.1	EFFICIENT CODING STYLES.	DAY 26	T1 (243-272)		https://nptel.ac.in/courses/106102181/4,25	C1-C16	Students will be able to find critical path in circuit design
36	27	27.1	COMBINATORIAL LOGIC SYNTHESIS	DAY 27		R3 (274-278)		C1-C16, P17	Students will be able to synthesize circuits with optimized logic gates.
37	28	28.1	PARTITIONING FOR SYNTHESIS.	DAY 28		R4 (416-497)	https://nptel.ac.in/courses/106102181/18,19,20	C1-C16	Students will be able to implement area efficient layout of design.
38	29	29.1	PIPELINING AND RESOURCE SHARING.	DAY 29		R4 (502-510)		C1-C16, P11	Students will be able to implement speed efficient design with optimum utilization of resources .
39	30	30.1	OPTIMIZING ARITHMETIC OPERATIONS.	DAY 30	T1 (244-245)	R4 (511-537)		C1-C16, P11	Students will efficiently optimize speed through parallel processing
40	31	31.1	POWER ANALYSIS OF FPGA BASED SYSTEM	DAY 31		R4 (467-497)		C1-C16, P11	Students will be able to analyze power consumption of hardware.

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41	32	32.1	INTRODUCTION TO PLACE AND ROUTE PROCESS.	DAY 32	T1 (284-286, 370-377)			C1-C16	Students will be able to analyze power requirement of designed circuit
42	33	33.1	ARCHITECTURE OF CPLD	DAY 33		R1 (231-240) R4 (52-70)		C1-C16, P7, P13+F120	Students will be able to optimize area requirement and connection complexity of designed circuit
43	34	34.1	ARCHITECTURE OF CPLD	DAY 34			https://nptel.ac.in/courses/17108040/37		Students will be able to model digital design with generalized hardware
44	35	35.1	FPGA XILINX 4000 SERIES.	DAY 35		R1 (219-229) R4 (74-94)	https://nptel.ac.in/courses/17108040/37	C1-C16, P12, P16, P17	Students will explore generalized architecture for modelling complex digital designs
45	36	36.1	FPGA XILINX 4000 SERIES.	DAY 36			https://nptel.ac.in/courses/17108040/40,41,42		
46	37	37.1	OVERVIEW OF PLD.	DAY 37		R4 (29-51)	https://nptel.ac.in/courses/17108040/40,41,42	C1-C16, P24, P26	Students will explore generalized architecture for modelling moderate/complex digital designs
47	38	38.1	OVERVIEW OF PROM PLD	DAY 38		R1 (85-89)	https://nptel.ac.in/courses/17108040/34,35,36	C1-C16, P24, P26	
48	39	39.1	OVERVIEW OF PLA PLD	DAY 39		R1 (89-96)		C1-C16, P24, P26	Students will compare and use required architecture for modelling digital designs
49	40	40.1	OVERVIEW OF PAL PLD	DAY 40		R1 (96-100)		C1-C16, P24, P26	Students will be able to use VHDL concepts in IC
50	41	41.1	DESIGN OF ALU	DAY 41	T1 (306-308)	R3 (329-332)		C1-C16	Students will be able to use VHDL concepts in IC
51	42	42.1	DESIGN OF BARELL SHIFTER.	DAY 42	T5 (303-304)			C1-C16 Principles	Students will be able to use VHDL concepts in IC

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52	43	43.1	DESIGN OF 4*4 KEYBOARD SCANNER.	DAY 43		R1 (109-117) R4 (235-237)		C1-C16	Students will be able to use VHDL concepts in IC design
53	44	44.1	DESIGN OF MULTIPLIER.	DAY 44	T5 (296-300)	R1 (124-132)		C1-C16	Students will be able to use VHDL concepts in IC design

*T=Text Book; R= Reference Book; C= Company name; P= Research Paper

Total number of lectures as per syllabus: - 36

Total number of lectures as per planned: - 44

Final Outcome of the Subject (Maximum 6 Outcome):

On completion of the course, the students shall be able to	
CO1:	Design of combinational & sequential circuit.
CO2:	Develop as skilled VLSI front end designers
CO3:	Implement digital system for practical world
CO4:	Experiment on Hardware /Software co-design

Code	Title of the Book	Author Name/Designation/Organization	Publisher	Edition/ Publication Year
T1:	VHDL Programming by Example	Douglas Perry	Tata McGraw Hill	4th / 2002
T2:	Fundamentals of Digital Logic with VHDL Design	Stephen Brown , Z.Vranesic	Tata McGraw Hill	2nd
T3:	Digital Design Principles	W. Fletcher	Prentice Hall India	EEE / 2009
T4:	VHDL Synthesis	J. Bhaskar	Pearson Education	4th
T5:	VHDL Primer	J. Bhaskar	Pearson Education	4th
R1:	Digital System Design using VHDL	Charles Roth	Tata McGraw Hill	2nd / 2012
R2:	Digital System Design with VHDL and Synthesis	K.C. Chang	Wiley India	Principal 2005
R3:	VHDL Modular Design and Synthesis	Zainalabedin Navabi	Tata McGraw Hill	3rd

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R4:			VHDL for Programmers Logic		Kevin Skahill		Pearson Education		LPE 2006
R5:			VHDL A Design oriented Approach		S. S. Limaye		McGraw Hill		2008
R6:			Switching and Finite Automata Theory		Zvi Kohavi		Cambridge University Press		3rd

Company/Industry:

Code	Company/Industry Name	Website	Detailed Information
C1	Sibridge Technologies	sibridgetech.com	A provider of innovative value added solution for design, verification and embedded systems development to worldwide semiconductors and electronic product companies
C2	SmartPlay Technologies	smartplayin.com	A provider of digital, analog, wireless software and system design and an independent design house for design and customization of 3G smart phones
C3	Terminus Circuits	terminus Circuits.com	A solution provider for OEM (Original Equipments Manufacturer) through custom IPs
C4	Adroit IC Design	adroiticedesign.com	A fabless semiconductor company designing next generation IP in cutting edge process technology node
C5	Ineda Systems	inedasystems.com	A provider of low power SOC's for the use in both consumer and enterprise applications.
C6	Infineon Technologies India Pvt. Ltd.	infineon.com	A provider of semiconductors and system solutions for automotive and industrial electronics and chip card and security applications
C7	Masamb Electronics Systems	masamb.com	A provider of semiconductor design services and Embedded Systems Design solutions.
C8	Saankhya Labs	saankhyalabs.com	A fabless semiconductor company designing software defined Universal demodulator IC for Digital and Analog TV reception.
C9	Semtronics Micro Systems	semtronicsmicrosystems.com	A provider of IC and IC based power systems design and manufacturing of LED drivers
C10	ON Semiconductor	www.onsemi.com	A provider of innovative energy efficient power and signal management logic, discrete and custom semiconductors products
C11	Texas Instruments	www.ti.com	A global semiconductor design and manufacturing company. Innovate with 80000+ analog ICs and Embedded processors, software & support
C12	National Instruments	www.ni.com	A global provider in automated Test and Measurement Systems
C13	AMD	www.amd.com	A global provider of Processor and Semicustom ICs and products

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C14	Motorola			www.motorola.in					A company designing Android cell phones and modular smartphones.
C15	Xilinx			www.xilinx.com					Inventor of the FPGA, programmable SoCs, and ACAP. Provider of highly-flexible programmable silicon, enabled by a suite of advanced software and tools. Xilinx delivers the most dynamic processing technology in the industry, enabling rapid innovation with its adaptable, intelligent computing.
C16	Intel			www.intel.com					A company designing processors, manufactures motherboard chipsets, NI Controllers, Memory chips, embedded processors and semiconductor devices related to communication and computing.

Research Paper:

Code	Title of the Paper	First Author Name	Journal/Conference Name	DOI no.	Issue/Volume/Page no/Year
P1	Digital statistical analysis using VHDL	Manfred Dietrich	Design, Automation & Test in Europe Conference &	DOI: 10.1109/DATE.2010.5456899	2010
P2	VHDL: a powerful digital design and simulation tool	R. Dabdoub	SOUTHEASTCON '96	DOI: 10.1109/SECON.1996.510130	1996
P3	System level design, a VHDL based approach	J. van den Hurk	EURO-DAC. European Design Automation Conference	DOI: 10.1109/EURDAC.1995.527461	1995
P4	Modeling digital systems using VHDL	P.J. Ashenden	IEEE Potentials	DOI: 10.1109/45.666643	1998 Volume: 17., Issue: 2
P5	A bottom-up approach to digital design with	Giuliano	IEEE International	DOI: 10.1109/MSE.2011.5937085	2011
P6	VHDL-based digital circuit synthesis: a case study	F.L. Viana	Third IEEE International Caracas Conference on Devices, Circuits and	DOI: 10.1109/ICCDACS.2000.869810	2000
P7	VHDL implementation of a bidirectional interface for 3ATI avionic sub-systems	P. Mahdian	The 23rd Digital Avionics Systems Conference (IEEE)	DOI: 10.1109/DASC.2004.1390828	2004
P8	On comparing different modeling styles [VHDL]	W. Ecker	VHDL International Users' Forum. Fall Conference	DOI: 10.1109/VIUF.1997.623959	1997

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p9			VHDL: software based hardware designs	S.V. Wunnava	IEEE Southeastcon '98 'Engineering for a New Era'		DOI: 10.1109/SECON.1998.673377		1998
P10			Simple traffic light controller: A digital systems design project	Jose E. Ortiz	IEEE SoutheastCon		DOI: 10.1109/SECON.2010.5453915		2010
P11			Project based learning experience in VHDL digital electronic circuit design	Felipe Machado	IEEE International Conference on Microelectronic Systems		DOI: 10.1109/MSE.2009.5270831		2009
P12			VHDL based circuits design and synthesis on FPGA: A dice game example for education	Sarah Toonsi	IEEE 2nd International Conference on Signal and		DOI: 10.1109/SIPROCESS.2017.8124575		2017
P13			VHDL-based design and design methodology for reusable high performance direct digital frequency synthesizers	I. Janiszewski	38th Design Automation Conference (IEEE Cat. No.01CH37232)		DOI: 10.1109/DAC.2001.1156205		2001
P14			Design and implementation of digital systems for automatic control based on behavioural descriptions	P. Kollig	IEE Colloquium on Digital System Design Using Synthesis Techniques		DOI: 10.1049/ic:19960163		1996
P15			Incorporating VHDL in teaching combinational logic circuit	Husna Zainol Abidin	2nd International Congress on Engineering Education		DOI: 10.1109/ICEED.2010.5940796		2010
P16			Digital design of DS-CDMA transmitter using VHDL and FPGA	K.E. Mohamed	13th IEEE International Conference on Networks Jointly held with the 2005		DOI: 10.1109/ICON.2005.1635578		2005, Volume: 2
P17			Design of combinational logic training system using FPGA	Sujitra Sothong	IEEE Frontiers in Education Conference (FIE)		DOI: 10.1109/FIE.2010.5673663		2010
P18			Top-down design process for gate-level combinational logic design	R.S. Sandige	IEEE Transactions on Education		DOI: 10.1109/13.144655		1992 Volume: 35, Issue: 3
P19			A scan design for asynchronous sequential logic circuits using SR-latches	Ming-Der Shieh	36th Midwest Symposium on Circuits and Systems		DOI: 10.1109/MWSCAS.1993.348339		1993
P20			Design of sequential logic circuits based on Evolvable Hardware	Zhang Zhiwu	IEEE 10th International Conference on Electronic		DOI: 10.1109/ICEMI.2011.6037897		2011 Volume: 3
P21			An efficient modeling and synthesis procedure of asynchronous sequential logic circuits	J.-W. Kang	35th Midwest Symposium on Circuits and Systems		DOI: 10.1109/MWSCAS.1992.271274		1992

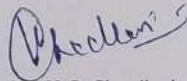
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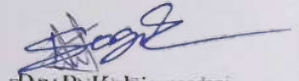
Sr. No.	Lec. No.	Topic Code	Contents to be Covered	Planned Teaching Dates	Text Book (Page no)	Reference Book (Page no)	URL's (NPTEL/OnlineMaterial/Pt/Video)	Applications (R&D/ Industry)	Learning Outcomes
P22			Timing verification of sequential dynamic circuits	D. Van Campenhout	IEEE Transactions on Computer-Aided Design of Integrated Circuits and		DOI: 10.1109/43.759081		1999 Volume: 18 , Issue: 5
P23			Using VHDL Simulator to Estimate Logic Path Delays in Combinational and Embedded Sequential Circuits	M.L.J. Sokolovic	EUROCON 2005 - The International Conference on "Computer as a Tool"		DOI: 10.1109/EURCON.2005.1630296		Year: 2005 Volume: 2
P24			Use of programmable logic devices as an aid to system design	T.C. Mace	IEE Colloquium on Programmable Logic Devices for Digital Systems				1990
P25			A Novel Overlap-Based Logic Cell: An Efficient Implementation of Flip-Flops With Embedded Logic	Omid Sarbishei	IEEE Transactions on Very Large Scale Integration (VLSI) Systems		DOI: 10.1109/TVLSI.2008.2009453		2010 Volume: 18 , Issue: 2
P26			Arithmetic functions in programmable logic	WESCO N '94			DOI: 10.1109/WESCON.1994.403537		1994



Mr. N. A. Mohota
Subject Incharge



Mr. V. P. Chaudhari
Academic Incharge



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DEPARTMENT OF CSE-IT
SESSION 2019-20

TEACHING PLAN

NAME OF THE TEACHER :- Prof. Supriya S. Sawwashere
 SUBJECT :- Object Oriented Software and Web Engineering
 YR/SEM :- 3rd /6th Sem

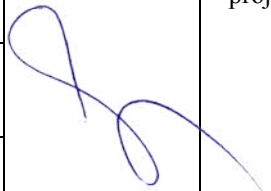
SUBJECT CODE :- BTITC603

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UNIT-I										
1	1	1.01	Object Basics, Object oriented philosophy, objects, classes, attributes	11/01/2020	11/01/2020	T1 Pg:13-17	R1 Pg:34	https://www.youtube.com/watch?v=BqVqjJq7_vl	P1	Understand Object Oriented Software Development Process..
2	2	1.02	object behaviour and methods	13/01/2020	13/01/2020	T1 Pg: 18-20		https://www.youtube.com/watch?v=BqVqjJq7_vl		
3	3	1.03	encapsulation and information hiding	14/01/2020	14/01/2020	T1 Pg: 20-21		https://www.youtube.com/watch?v=JFbL5HYQcs8&list=PLrjkTqI3jnm_kpRxNK6la_gHuKQ3WI_dL&index=4		
4		1.04	class hierarchy, polymorphism, object relationships and associations	15/01/2020	25/01/2020	T1 Pg:21-25		https://www.youtube.com/watch?v=XoZp4MuG5UQ&list=PLrjkTqI3jnm_kpRxNK6la_gHuKQ3WI_dL&index=7		
5		1.05	aggregations and object containment,	20/01/2020	27/01/2020	T1 Pg:27-28		https://www.youtube.com/watch?v=BqVqjJq7_vl		
6		1.06	case study, object identity, persistence	21/01/2020	03/02/2020	T1 Pg:28-34		https://www.youtube.com/watch?v=BqVqjJq7_vl		
7		1.07	Object oriented systems development life cycle	22/01/2020	04/02/2020	T1 Pg:39		https://www.youtube.com/watch?v=BqVqjJq7_vl		
8		1.08	Software development process, building high quality software	25/01/2020	05/02/2020	T1 Pg:40-42		https://www.youtube.com/watch?v=BqVqjJq7_vl		
9	4	1.09	Use- case driven approach, reusability	27/01/2020	8/02/20	T1 Pg: 45-53	R1 Pg:75	https://www.youtube.com/watch?v=BqVqjJq7_vl		

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UNIT-II										
10		2.01	Object Oriented Methodologies: Rumbaugh et al.'s object modeling technique	28/01/2020	10/02/2020	T1 Pg:61-64		https://www.youtube.com/watch?v=cw9NmtqZPzg&list=PLrjKTqI3jnm_kpRxNK6la_gHuKQ3WI_dL&index=9	P1	Gain exposure to Object Oriented Methodologies & UML Diagrams.
11		2.02	Booch methodology, Jacobson et al methodologies	29/01/2020	11/02/2020	T1 Pg:65-67		https://www.youtube.com/watch?v=6oz8MKShCVE		
12		2.03	patterns, frameworks, and the unified approach, Unified modeling language	03/02/2020	12/02/2020	T1 Pg:71-84		https://www.youtube.com/watch?v=6oz8MKShCVE		
13		2.04	Static and dynamic models, UML diagrams	04/02/2020	15/02/2020	T1 Pg:89-91		https://www.youtube.com/watch?v=8xQJunoCRwY		
14		2.05	UML class diagrams, use-case diagrams	05/02/2020	17/02/2020	T1 Pg:94-101		https://www.youtube.com/watch?v=8xQJunoCRwY		
15		2.06	UML dynamic modeling, packages, UML extensibility and UML Meta model	08/02/2020	18/02/2020	T1 Pg:102-112		https://www.youtube.com/watch?v=8xQJunoCRwY		

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UNIT-III										
16		3.01	Object Oriented Analysis Process: Business object analysis	10/02/2020	22/02/2020	T1 Pg:125-127		https://www.youtube.com/watch?v=3WmwsR0WXbk	P1	Apply Object Oriented Analysis Processes for projects..
17		3.02	use-case driven object oriented analysis, business process modeling	11/02/2020	24/02/2020	T1 Pg:129		https://www.youtube.com/watch?v=3WmwsR0WXbk		
18		3.03	use-case model, developing effective documentation	12/02/2020	25/02/2020	T1 Pg:129-137		https://www.youtube.com/watch?v=3WmwsR0WXbk		
19		3.04	case study. Classification: Classification theory,noun phrase approach	15/02/2020	26/02/2020	T1 Pg:140-146		https://www.youtube.com/watch?v=JSLEI3H7p1A		
20		3.05	common class patterns approach, use-case driven approach	17/02/2020	29/02/2020	T1 Pg:162-163		https://www.youtube.com/watch?v=JSLEI3H7p1A		
21		3.06	classes, responsibilities	18/02/2020	02/03/2020	T1 Pg:169-170		https://www.youtube.com/watch?v=JSLEI3H7p1A		


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22		3.07	collaborators, naming classes	22/02/2020	02/03/2020	T1 Pg:171-174		https://www.youtube.com/watch?v=KhOre9ACI6A		
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Sr. No	Lec. No	Topic Code	Contents to be Covered	Planned Teaching Dates	Actual Teaching Date	Text Books (Page no)	Reference Book (Page no)	URL's (NPTEL/OnlineMaterial/PPT/Video)	Applications (R&D/ Industry)	Learning Outcomes
UNIT-IV										
23		4.01	Identifying Object Relationships, Attributes and Methods: Association	24/02/2020	03/03/2020	T1 Pg:177-179		https://www.youtube.com/watch?v=0po_wmSEW1Q	P2	Analyze the characteristics of web applications.
24		4.02	super-subclass relationships, a-part of relationships, case study, class responsibility	25/02/2020	04/03/2020	T1 Pg:181-183		https://www.youtube.com/watch?v=0po_wmSEW1Q		
25		4.03	Defining attributes for vianet bank objects, object responsibility	26/02/2020	09/03/2020	T1 Pg:190-191		https://www.youtube.com/watch?v=0po_wmSEW1Q		
26		4.04	defining methods for vianet bank objects Design process and design axioms	29/02/2020	09/03/2020	T1 Pg:192-194		https://www.youtube.com/watch?v=0po_wmSEW1Q		
27		4.05	Corollaries, design patterns	02/03/2020	09/03/2020	T1 Pg:203-208		https://www.youtube.com/watch?v=MeGiAaU4IXw		
28		4.06	Designing Classes: UML object constraint languages, designing classes, class visibility	03/03/2020	09/03/2020	T1 Pg:217-221		https://www.youtube.com/watch?v=MeGiAaU4IXw		
29		4.07	refining attributes for the vianet bank objects, designing methods and protocols	04/03/2020	11/03/2020	T1 Pg:223-227		https://www.youtube.com/watch?v=MeGiAaU4IXw		
30		4.08	designing methods for the vianet bank objects, packages and managing classes	09/03/2020	11/03/2020	T1 Pg:227-232		https://www.youtube.com/watch?v=MeGiAaU4IXw		
31		4.09	Designing access layer, Designing view layer, macro level process	11/03/2020	14/03/2020	T1 Pg:233-238		https://www.youtube.com/watch?v=MeGiAaU4IXw		

Sr. No	Lec. No	Topic Code	Contents to be Covered	Planned Teaching Dates	Actual Teaching Date	Text Books (Page no)	Reference Book (Page no)	URL's (NPTEL/OnlineMaterial/PPT/Video)	Applications (R&D/ Industry)	Learning Outcomes
UNIT-V										
32		5.01	Introduction to Web Engineering and requirement	14/03/2020	14/03/2020	T2 Pg:01-06		https://www.youtube.com/watch?v=whRiauuBgV8&list=PLV8vIYTI		

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			engineering: Motivation, Categories of Web Applications					dSnbwIFENjqBK7yyAkSVSoLBC	P3	Designing Web Application
33		5.02	Characteristics of Web Applications, Product-related Characteristics	16/03/2020	16/03/2020	T2 Pg:07-11		https://www.youtube.com/watch?v=whRiauuBgV8&list=PLV8vIYTI dSnbwIFENjqBK7yyAkSVSoLBC		
34		5.03	Usage related Characteristics, Development-related Characteristic	17/03/2020	17/03/2020	T2 Pg:12-13		https://www.youtube.com/watch?v=whRiauuBgV8&list=PLV8vIYTI dSnbwIFENjqBK7yyAkSVSoLBC		
35		5.04	Web Application Architecture and Modelling Web Applications: Introduction- Categorizing Architectures	18/03/2020	18/03/2020	T2 Pg:14-16		https://www.youtube.com/watch?v=whRiauuBgV8&list=PLV8vIYTI dSnbwIFENjqBK7yyAkSVSoLBC		
36		5.05	Specifics of Web Application Architectures, Components of a Generic Web Application Architecture	23/03/2020	23/03/2020	T2 Pg:26-31		https://www.youtube.com/watch?v=8VWu_8c_7NE&list=PLSX_kNujX-qdXfe5RfaewpKzJHULRLTjD		
37		5.06	Layered Architectures, 2-Layer Architectures, N-Layer Architectures Data-aspect Architectures	24/03/2020	24/03/2020	T2 Pg:72-73		https://www.youtube.com/watch?v=8VWu_8c_7NE&list=PLSX_kNujX-qdXfe5RfaewpKzJHULRLTjD		
38		5.07	Database-centric Architectures, Architectures for Web Document Management	28/03/2020	28/03/2020	T2 Pg:80-81		https://www.youtube.com/watch?v=8VWu_8c_7NE&list=PLSX_kNujX-qdXfe5RfaewpKzJHULRLTjD		
39		5.08	Architectures for Multimedia Data Modeling Specifics in Web Engineering, Levels, Aspects	30/03/2020	30/03/2020	T2 Pg:80-81		https://www.youtube.com/watch?v=MeGiAaU4IXw		
40		5.09	Phases Customization, Modeling Requirements, Hypertext Modeling	31/03/2020	31/03/2020	T2 Pg:82-86		https://www.youtube.com/watch?v=MeGiAaU4IXw		

Sr. No	Lec. No	Topic Code	Contents to be Covered	Planned Teaching Dates	Actual Teaching Date	Text Books (Page no)	Reference Book (Page no)	URL's (NPTEL/OnlineMaterial/PPT/Video)	Applications (R&D/ Industry)	Learning Outcomes
UNIT-VI										
19		6.01	Web Application Design: Introduction, Web Design from an Evolutionary	07/04/2020	07/04/2020	T2 Pg:86-90		https://www.youtube.com/watch?v=d1Gd-MGaleE&list=PLV8vIYTI dSnbwIFENjqBK7yyAkSVSoLBC		

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			Perspective, Information Design					Pr915ebZONvUVHKm8Bls6D7EgA	P3	Testing and Analyzing the Web Applications
20		6.02	Software Design: A Programming Activity, Merging Information Design and Software Design	08/04/2020	08/04/2020	T2 Pg:91-93		https://www.youtube.com/watch?v=d1Gd-MGaleE&list=PLUU3EzfPr915ebZONvUVHKm8Bls6D7EgA		
21		6.03	Problems and Restrictions in Integrated Web Design, A Proposed Structural Approach, Presentation Design	11/04/2020	11/04/2020	T2 Pg:94-96		https://www.youtube.com/watch?v=RsQ1tFLwldY		
22		6.03	Presentation of Nodes and Meshes	13/04/2020	13/04/2020	T2 Pg:96-97		https://www.youtube.com/watch?v=RsQ1tFLwldY		
23		6.04	Testing Web Applications: Introduction, Fundamentals, Terminology, Quality Characteristics	15/04/2020	15/04/2020	T2 Pg:133-135		https://www.youtube.com/watch?v=RsQ1tFLwldY		
24		6.05	Test Objectives, Test Levels, Role of the Tester, Test Specifics in Web Engineering, Test Approaches	20/04/2020	20/04/2020	T2 Pg:136-140		https://www.youtube.com/watch?v=5fziq0PzUv0		
25		6.06	Conventional Approaches, Agile Approaches, Test Scheme, Three Test Dimensions	21/04/2020	21/04/2020	T2 Pg:140-142		https://www.youtube.com/watch?v=5fziq0PzUv0		
26		6.07	Applying the Scheme to Web Applications, Test Methods and Techniques, Link Testing, Browser Testing	22/04/2020	22/04/2020	T2 Pg:143-147		https://www.youtube.com/watch?v=5fziq0PzUv0		
		6.08	Usability Testing, Load, Stress, and Continuous Testing, Testing Security	25/04/2020	25/04/2020	T2 Pg:148-149		https://www.youtube.com/watch?v=IHs7OjL_6lg		
27		6.09	Test-driven Development, Test Automation	27/04/2020	27/04/2020	T2 Pg:149-150		https://www.youtube.com/watch?v=IHs7OjL_6lg		

Total number of lectures as per syllabus: - 36

Total number of lectures as per planned: - 27

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Final Outcome of the Subject (Maximum 6 Outcome):

After learning the course the students should be able:

1. Understand Object Oriented Software Development Process..
2. Gain exposure to Object Oriented Methodologies & UML Diagrams.
3. Apply Object Oriented Analysis Processes for projects
4. Analyze the characteristics of web applications
5. Designing Web Application
6. Testing and Analyzing the Web Applications

Text Books:

Code	Title of the Book	Author Name/Designation/ Organization	Publisher	Edition/ Publication Year
T1	Object Oriented Systems Development using the Unified Modeling Language	Ali Bahrami	McGraw Hill	Reprint, 2009
T2	Web Engineering	Gerti Kappel, Birgit Proll	John Wiley and Sons Ltd	2006

Reference Books:

Code	Title of the Book	Author Name/Designation/ Organization	Publisher	Edition/ Publication Year
R1	Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development	Craig Larman	Pearson Education	3rd Edition, 2005

Company/Industry:

Code	Company/Industry Name	Website	Detailed Information
C1	CISCO Pvt. Ltd.	www.cisco.com	Cisco Systems , American technology company, operating worldwide, that is best known for its computer networking products. As a company that sold its products mostly to other businesses, Cisco did not become a household name, but in the second decade of the 21st century it was one of the largest corporations in the United States. Cisco was founded in 1984 and has its headquarters in San Jose, California.
C2	Honda R&D Americas, Inc	www.hondaresearch.com	(HRA) is an automobile, motorcycle, all-terrain vehicle, lawnmower, boat engine, and jet airplane developer located in North America. It develops vehicles for Honda and Acura sales in conjunction with other global R&D centers.

Research Paper:

Code	Title of the Paper	First Author Name	Journal/Conference Name	DOI no.	Issue/Volume/Page no/Year
P1	Research Paper on Object Oriented Software Engineering	Iqbaldeep Kaur, Navneet Kaur, Amandeep Ummat, Jaspreet Kaur, Navjot Kaur	International Journal of Computer Science And Technology	ISSN : 0976-8491 (Online) ISSN : 2229-4333 (Print)	IJCST Vol. 7, Issue 4, Oct - Dec 2016
P2	Object-Oriented Programming and its Concepts	Ashwin Urdhwareshe	International Journal of Innovation and Scientific Research		ISSN 2351-8014 Vol. 26 No. 1 Aug. 2016, pp. 1-6
P3	Student Research in Web Engineering: An International Perspective on Internal and External Opportunities	Larry Hatch and Thomas J. Heistracher	International Journal of Research in Computer Engineering and Electronics	ISSN 2319-376X VO1	: 2 ISSUE :3 (June 2013)



Prof. Supriya Sawwashere
Subject Incharge




Prof. R.Kokate
DBATU Co-ordinator



Prof. Milind Tote
Academic Incharge



Prof. Madhuri Pal
HOD (CSE-IT)



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DEPARTMENT OF MECHANICAL ENGINEERING (DOME)
 .. SESSION 2019-20

TEACHING PLAN

NAME OF THE TEACHER :-Prof. Anup A. Junankar
 SUBJECT :-Material Science & Metallurgy
 YR/SEM :-SECOND YEAR/ SEM III

SUBJECT CODE :- BTMEC 302
 SECTION :-A

Sr. No	Lec No	Topic Code	Contents to be Covered	Planned Teaching Dates	Text Books (Page no)	Reference Book (Page no)	URL's (NPTEL/Online Material/PPt/Video)	Applications (R&D/Industry)	Learning Outcomes	Sign
Unit No. 1 Structure of Materials										
1	1	1.01	Crystal structures,	01/07/19	T1 (P.No.1-8)	R1 (P.No.11-16)	https://www.youtube.com/watch?v=6vyYRnLvnqI		Student should analyze various types of crystal structure and properties.	
2	2	1.02	Indexing of lattice planes,	02/07/19	T1 (P.No.9-11)	R1 (P.No.19-23)	https://www.youtube.com/watch?v=6vyYRnLvnqI		Student should analyze various types of crystal structure and properties.	
3	3	1.03	Indexing of lattice directions	03/07/19	T1 (P.No.9-11)	R1 (P.No.19-23)	https://www.youtube.com/watch?v=6vyYRnLvnqI		Student should identify and analyze defects observed in crystal structure.	
4	4	1.04	Imperfections in crystals-point defects, line defects, surface and bulk defects	08/07/19	T1 (P.No.30-42)	R1 (P.No.59-66)	https://www.youtube.com/watch?v=8QWodQvxpzM		Student should understand the basic concept of plastic deformation	
5	5	1.05	Mechanism of plastic deformation	09/07/19	T1 (P.No.42-46)	R1 (P.No.67)	https://www.youtube.com/watch?v=IW r8fmUGXeE		Student should understand the basic concept of plastic deformation	
6	6	1.06	Deformation of single crystal by slip	10/07/19	T1 (P.No.46-49)	NA	https://www.youtube.com/watch?v=IW r8fmUGXeE		Student should understand the basic concept of plastic deformation	
7	7	1.07	Plastic deformation of polycrystalline materials.	15/07/19	T1 (P.No.51-52)	NA	NA		Student should identify and analyze defects observed in crystal structure.	

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Unit No. 2 Mechanical Properties and their Testing

8	8	2.01	Introduction to Tensile test	16/07/19	T1 (P.No.63-64)	R2 (P.No. 447-452)	https://www.youtube.com/watch?v=hnkFR5J_Ifw	C3	Student should understand and demonstrate the tensile test.
9	9	2.02	Engineering stress-strain curve,	17/07/19	T1 (P.No.64-86)	R1 (P.No.44)	https://www.youtube.com/watch?v=JGK8i0X55Mc	C3	Student should identify the terminologies of stress-strain curves.
10	10	2.03	True stress-strain curve types of stress-strain curves	22/07/19	T1 (P.No.64-86)	R1 (P.No.44)	https://www.youtube.com/watch?v=JGK8i0X55Mc	C3	Student should identify the terminologies of stress-strain curves.
11	11	2.04	Compression test bend test,	23/07/19	T1 (P.No.89-91)	R2 (P.No. 458)	https://www.youtube.com/watch?v=frBDo8NNfoU	C3	Student should understand and demonstrate the compression and bend test
12	12	2.05	Torsion test, Formability	24/07/19	T1 (P.No.93-95)	NA	https://www.youtube.com/watch?v=qPIug2sewFA	C3	Student should understand and demonstrate the torsions test and formability.
13	13	2.06	hardness testing different hardness tests-Vickers, Rockwell, Brinell	29/07/19	T1 (P.No.100-113)	R1 (P.No.50)	https://www.youtube.com/watch?v=G2JGNIIvNC4	C3	Student should understand and demonstrate the hardness testing.
14	14	2.07	Impact test, fatigue test, creep test	30/07/19	T1 (P.No.127-141)	R2 (P.No. 459 - 463)	https://www.youtube.com/watch?v=tpGhqQvftAo	C3	Student should understand and demonstrate the impact, fatigue and creep test.

Unit No. 3 Equilibrium Diagrams

15	15	3.01	Definitions of terms, rules of solid-solubility, Gibb's phase rule,	31/07/19	T1 (P.No.167-170)	R1 (P.No.82)	NA		Student should analyze rules of solid solubility.
16	16	3.02	solidification of a pure metal, plotting of equilibrium diagrams	06/08/19	T1 (P.No.172-173)	R1 (P.No.81)	NA		Student should plot equilibrium diagrams.
17	17	3.03	Lever rule, Introduction to Iron-iron carbide equilibrium diagram	07/08/19	T1 (P.No.183 & 324)	R1 (P.No.82)	https://www.youtube.com/watch?v=Izhv87GILAU	C1	Student should evaluate Iron-Carbon phase diagram.

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18	18	3.04	Iron-iron carbide equilibrium diagram, critical temperatures, solidification and microstructure of slowly cooled steels	13/08/19	T1 (P.No.324-330)	R1 (P.No.103)	https://www.youtube.com/watch?v=Izhv87GIL4U	C1	Student should evaluate Iron-Carbon phase diagram along with all critical temperatures.
19	19	3.05	Non-equilibrium cooling of steels property variation with microstructures	14/08/19	T1 (P.No.339-342)	NA	NA	C1	Student should understand the non-eqllm. cooling of steel.
20	20	3.06	Classification and application of steels, specification of steels, transformation products of austenite, TTT diagram, critical cooling rate, CCT diagram	19/08/19	T1 (P.No.343-368)	R1 (P.No.115-118)	https://www.youtube.com/watch?v=wVZkdWEZv80	C1	Student should analyze the difference between TTT diagram.
21	21	3.07	critical cooling rate, CCT diagram	20/08/19	T1 (P.No.343-368)	R1 (P.No.115-118)	https://www.youtube.com/watch?v=-YN7nP6KwTs		Student should analyze the difference between CCT diagram.
Unit No. 4 Heat Treatment									
22	22	4.01	Heat treatment of steels,	21/08/19	T1 (P.No.368-371)	R1 (P.No.119)	https://www.youtube.com/watch?v=748ME0p0Ag	C2	Student should understand the working principle of HT process.
23	23	4.02	Cooling media, annealing processes	26/08/19	T1 (P.No.371-390)	R1 (P.No.119)	https://www.youtube.com/watch?v=748ME0p0Ag	C2	Student should select proper cooling media for any HT process
24	24	4.03	Normalizing, Hardening, Tempering,	27/08/19	T1 (P.No.393-399)	R1 (P.No.121)	https://www.youtube.com/watch?v=sKq3but88Qw	C2	Student should select and suggesting HT process.
25	25	4.04	Quenching and Hardenability	28/08/19	T1 (P.No.393-399)	R1 (P.No.121)	https://www.youtube.com/watch?v=sKq3but88Qw	C2	Student should select and suggesting HT process.
26	26	4.05	Surface Hardening Processes- Nitriding	04/09/19	T1 (P.No.394-423)	NA	https://www.youtube.com/watch?v=rUOQ25-RcVY	C2	Student should select and suggesting HT process.
27	27	4.06	Surface hardening processes- Carbo-nitriding,	09/09/19	T1 (P.No.424-425)	NA	https://www.youtube.com/watch?v=rUOQ25-RcVY	C2	Student should select and suggesting HT process.
28	28	4.07	Flame hardening, Induction Hardening	11/09/19	T1 (P.No.425-426)	NA	https://www.youtube.com/watch?v=rUOQ25-RcVY	C2	Student should select and suggesting HT process.
Unit No. 5 Metallography									
29	29	5.01	Microscopy, specimen preparation	16/09/19	T1 (P.No.286-289)	R2 (P.No.486)	https://www.youtube.com/watch?v=IPjM4UGumT4		Student should understand methodology of specimen preparation.

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30	30	5.02	Polishing abrasives and cloths specimen mounting, electrolytic polishing,	17/09/19	T1 (P.No.289-292)	NA	https://www.youtube.com/watch?v=IPjM4UGumT4		Student should understand methodology of specimen preparation.
31	31	5.03	Etching procedure and reagents, Electrolytic etching,	18/09/19	T1 (P.No.301-302)	NA	https://www.youtube.com/watch?v=VR9d6RnmZww		Student should understand methodology of specimen preparation.
32	32	5.04	Optical metallurgical microscope	23/09/19	T1 (P.No.301-302)	NA	https://www.youtube.com/watch?v=VR9d6RnmZww		Student should understand methodology to operate optical metallurgical m/s.
33	33	5.05	Macroscopy, sulphur printing	24/09/19	T1 (P.No.307-312)	NA	NA		Student should understand methodology of macroscopy.
34	34	5.06	Flow line observations, Examination of fractures, Spark test	25/09/19	T1 (P.No.313-317)	NA	NA		Student should understand methodology of macroscopy.
35	35	5.07	Electron microscope	30/09/19	T1 (P.No.319-320)	R2 (P.No.490)	https://www.youtube.com/watch?v=GY9lfO-tVfE		Student should understand methodology to operate optical metallurgical m/s.
Unit No. 6 Strengthening Mechanisms and Non-destructive Testing									
36	36	6.01	Refinement of grain size, cold working/strain hardening	01/10/19	T1 (P.No.531-533)	NA	https://www.youtube.com/watch?v=ROBwsEBrdik		Student should understand the strengthening mechanism concept.
37	37	6.02	Solid solution strengthening, dispersion strengthening	07/10/19	T1 (P.No.534-535)	NA	https://www.youtube.com/watch?v=14WeQp_UfNo		Student should understand the strengthening mechanism concept.
38	38	6.03	Precipitation hardening,	09/10/19	T1 (P.No.537-541)	NA	NA		Student should understand the strengthening mechanism concept.
39	39	6.04	Magnetic particle inspection,	14/10/19	T1 (P.No.153-155)	P.No. (470-472)	https://www.youtube.com/watch?v=qpgcD5k1494	C3	Student should understand the methodology of magnetic particle test.
40	40	6.05	Dye Penetrant inspection,	15/10/19	T1 (P.No.155-156)	(P.No. 468-469)	https://www.youtube.com/watch?v=xEK-c1pkTUI	C3	Student should understand the methodology of dye penetration inspection
41	41	6.06	Ultrasonic inspection, radiography	16/10/19	T1 (P.No.155-156)	(P.No. 474-483)	https://www.youtube.com/watch?v=UM6XKvXWVFA	C3	Student should understand the methodology of

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42	42	6.07	Eddy current testing, acoustic emission inspection.	21/10/19	T1 (P.No.163-165)	R2 (P.No. 472-474) (P.No. 483-484)	https://www.youtube.com/watch?v=ueFnrcdPVwk	C3	ultrasonic and radiography testing. Student should understand the methodology of eddy current and acoustic emission testing.
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*T=Text Book; R= Reference Book; C= Company name; P= Research Paper

Total number of lectures as per syllabus: 42

Total number of lectures as per planned: 42

Final Outcome of the Subject:

- CO1.Students should be able to analyze the structure of materials at different levels
- CO2.Students should be able to understand mechanical properties of materials and calculations of same using appropriate equations
- CO3.Students should be able to evaluate phase diagrams of various materials
- CO4.Students should be able to select & suggest appropriate heat treatment process for a given application
- CO5.Students should be able to prepare samples of different materials for metallography
- CO6.Students should be able to recommend appropriate NDT technique for a given application

Text Books:

Code	Title of the Book	Author Name/Designation/ Organization	Publisher	Edition/ Publication Year
T1	Material Science and Metallurgy for Engineers	V. D. Kodgire, S.V. Kodgire	Everest Publishing House	24 th edition/ 2008
T2	Introduction to Physical Metallurgy	S. H. Avner	Tata McGraw Hill	2 nd edition/ 1997

Reference Books:

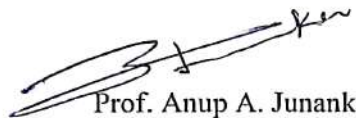
Code	Title of the Book	Author Name/Designation/ Organization	Publisher	Edition/ Publication Year
R1	Materials Science and Engineering	G. F. Carter, D. E. Paul	ASM International	3 rd edition/2000
R2	Introduction to Engineering Materials	V. B. John	ELBS	6 th edition / 2001

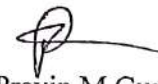
Company/Industry:

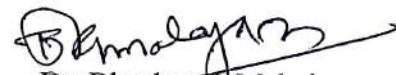
Code	Company/Industry Name	Website	Detailed Information
C1	Steel Authority of India Ltd Tata Steel JSW	https://www.sail.co.in/ https://www.tatasteel.com/ https://www.jsw.in/	Steel Authority of India Limited (SAIL) is the largest steel-making company in India and one of the seven Maharatna's of the country's Central Public Sector Enterprises. Tata Steel is one of the top steel producing companies globally with annual crude steel deliveries of 27.5 million tonnes (in FY17), and the second largest steel company in India (measured by domestic production) with an annual capacity of 13 million tonnes after SAIL. JSW Group is a \$14 billion company. It is an integral part of the O. P. Jindal Group, and

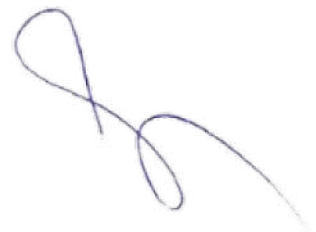
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			has been a part of major projects that have played a key role in India's growth.
C2	METALS INDIA Heat Treat Well	http://www.metalsindia.com/ https://mianagpur.com/industry/heat-treat-well/	Metals India specializes in providing heat treatment services for the complete manufacturing industries, including Defence, Railway, Aerospace, Automobile, Surgical, plastic moulds, tools & Dies etc. The company has acquired an enviable position in the Indian industry since last 30 years as a commercial heat treatment unit. Heat Treat Well located in Plot No.E-12/1 , MIDC Hingana, Nagpur. It is leading industries in the sector of steel heat treatment
C3	Quality NDT Services	http://www.qualityndt.org/	Quality NDT Services an independent organisation providing supplementary services in non-destructive testing since 1990 for Engineering Industries Globally. We deploy qualified NDT personnel & approved equipments for Radiography Testing (RT), Ultrasonic Testing (UT), Magnetic Particle Testing (MPT) & Penetrant Testing (PT) to meet the specific requirement of the client industries.


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Subject Teacher
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Prof. Pravin M. Gupta
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Education to Eternity

**JAIDEV EDUCATION SOCIETY'S
JD COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR**
Website: www.jdcoem.ac.in E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU



॥ ज्ञानं सर्वमोक्षाय ॥

VISION

To be a center of excellence imparting professional education satisfying societal and global needs.

MISSION

1. Transforming students into lifelong learners through, quality teaching, training and exposure to concurrent technologies.
2. Fostering conducive atmosphere for research and development through well-equipped laboratories and qualified personnel in collaboration with global organizations.

Teaching Plan

Course : Masters of Business Administration	Year/Semester : 2 nd semester (1 st Year)	
Name of the Teacher : Dr. Manoj Rao	Subject Code : 2T1	
Subject : FINANCIAL MANAGEMENT	Section :	
Periods per Week (each 60 min)	Lecture	3
	Tutorial	1
	Practical	-

Course Objective	Course Outcomes
<ol style="list-style-type: none"> 1. To learn various ways and means of generating capital <i>for the business</i>. 2. Apply the Leverage and EBIT EPS Analysis associate with Financial Data in the corporate. 3. To acquire the knowledge to understand the complexities associated with management of cost of funds in the capital Structure 4. To obtain the knowledge and details pertaining to elements of working capital for a given level of activity, 5. To demonstrate how the concepts of dividend policy decisions affects financing. 	<ol style="list-style-type: none"> 1. To be able to calculate specific cost of capital and weighted average cost of capital. 2. To be Able to he analyze the effect of operating and financial leverage on EPS and recommend a suitable long term financing mix for an organization 3. To be Able to evaluate and estimate projects' cash flows to distinguish between value creating and value destroying investments using time-value intensive DCF techniques and Non-DCF techniques 4. To be able to ascertain the components of current assets and current liabilities and determine the gross and net operating working capital requirement 6. 5. To be able to compute the value of a share using various dividend discount models and illustrate whether dividend is relevant for firm valuation or not.

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Sr.	Lec .	Top	Contents to be	Planned	Text Books	URL's	Application	Learning Outcomes
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No	No	ic Cod e	Covered	Teaching Dates	(Page no) Reference Book (Page no)	(NPTEL/OnlineMaterial /PPt/Video)	s (R&D/ Industry)
Unit I – Cost of Capital							
1	1	1	Cost of Capital: Concept and Importance;	Day 1	<ul style="list-style-type: none"> Financial Management, Theory Concepts and Problems - R.P. Rustagi 	https://www.youtube.com/watch?v=JlYY1NxGTQl	<ul style="list-style-type: none"> To be able to understand what is the meaning of cost of capital and its significance.
2	2	2	Measurement of Specific Costs – Redeemable and Irredeemable Debt,	Day 2	<ul style="list-style-type: none"> Financial Management, Theory Concepts and Problems - R.P. Rustagi 	https://www.youtube.com/watch?v=JlYY1NxGTQl	<ul style="list-style-type: none"> To be able to understand the cost associated with debt and how to measure it.
3	3	3	Redeemable and Irredeemable Preference shares	Day 3	<ul style="list-style-type: none"> Financial Management, Theory Concepts and Problems - R.P. Rustagi 	https://www.youtube.com/watch?v=JlYY1NxGTQl	<ul style="list-style-type: none"> To be able to understand the cost associated with Preference share and how to measure it.
4	4	4	Equity and Retained Earnings;	Day 4	<ul style="list-style-type: none"> Financial Management, Theory Concepts and Problems - R.P. Rustagi 	https://www.youtube.com/watch?v=JlYY1NxGTQl	<ul style="list-style-type: none"> To be able to understand the cost associated with equity and retain earning and how to measure it.
5	5	5	Computation of Overall Cost of Capital using book value weight.	Day 5	<ul style="list-style-type: none"> Financial Management, Theory Concepts and Problems - R.P. Rustagi 	https://www.youtube.com/watch?v=JlYY1NxGTQl	<ul style="list-style-type: none"> To be able to calculate overall cost of capital book weighted value
6	6	6	Computation of Overall Cost of Capital using Market value weight.	Day 6	<ul style="list-style-type: none"> Financial Management, Theory Concepts and Problems - R.P. Rustagi 	https://www.youtube.com/watch?v=JlYY1NxGTQl	<ul style="list-style-type: none"> To be able to calculate overall cost of capital market value.
Unit II – Leverage							
7	7	7	Introduction to Leverage:	Day 7	<ul style="list-style-type: none"> Financial Management: Theory and Practice, 	https://www.youtube.com/watch?v=kttYl54WnA	<ul style="list-style-type: none"> Able to understand the concept leverage

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					Prasanna Chandra,			
8	8	8	Operating leverage	Day 8	<ul style="list-style-type: none"> Financial Management: Theory and Practice, Prasanna Chandra, 	https://www.youtube.com/watch?v=kttYl_54WnA	<ul style="list-style-type: none"> Able to understand and analyse the operating leverage. 	
9	9	9	Financial leverage	Day 9	<ul style="list-style-type: none"> Financial Management: Theory and Practice, Prasanna Chandra, 	https://www.youtube.com/watch?v=kttYl_54WnA	C1-C10	<ul style="list-style-type: none"> Able to understand and analyse the financial leverage.
10	10	10	Combined leverage	Day 10	<ul style="list-style-type: none"> Financial Management: Theory and Practice, Prasanna Chandra, 	https://www.youtube.com/watch?v=kttYl_54WnA	C1-C10	<ul style="list-style-type: none"> Able to understand and analyse the combined leverage.
11	11	11	EBIT-EPS Analysis	Day 11	<ul style="list-style-type: none"> Financial Management: Theory and Practice, Prasanna Chandra, 	https://www.youtube.com/watch?v=kttYl_54WnA	C1-C10	<ul style="list-style-type: none"> Able to Apply the EBIT EPS Analysis associate with Financial Data in the corporate
12	12	12	Indifference Level of EBIT and Financial Break-even Analysis.	Day 12	<ul style="list-style-type: none"> Financial Management: Theory and Practice, Prasanna Chandra, 	https://www.youtube.com/watch?v=kttYl_54WnA		<ul style="list-style-type: none"> Able to Apply the EBIT EPS Analysis associate with Financial Data in the corporate
Unit III – Capital Budgeting								
13	13	13	Concept of Capital budgeting	Day 13	<ul style="list-style-type: none"> Management, M. Y. Khan & P. K. Jain 	https://www.youtube.com/watch?v=g6UCv4rkZ_Y		<ul style="list-style-type: none"> Developing the basic understanding of capital budgeting.
14	14	14	Discounted and Non-discounted Cash Flow Techniques.	Day 14	<ul style="list-style-type: none"> Management, M. Y. Khan & P. K. Jain 	https://www.youtube.com/watch?v=g6UCv4rkZ_Y		<ul style="list-style-type: none"> Developing the understanding and various terms of discounted and non discounted cash flow techniques.
15	15	15	Net Present Value technique	Day 15	<ul style="list-style-type: none"> Management, M. Y. Khan & P. K. Jain 	https://www.youtube.com/watch?v=g6UCv4rkZ_Y		<ul style="list-style-type: none"> Able to understand and apply net present value technique.
16	16	16	Internal rate of return technique	Day 16	<ul style="list-style-type: none"> Management, M. Y. Khan & P. K. Jain 	https://www.youtube.com/watch?v=g6UCv4rkZ_Y		<ul style="list-style-type: none"> Able to understand and apply Internal rate of return

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17	17	17	Discounted payback period technique	Day 17	<ul style="list-style-type: none"> Management, M. Y. Khan & P. K. Jain 	https://www.youtube.com/watch?v=g6UCv4rkZ_Y		<ul style="list-style-type: none"> Able to analyse the cash flow through discounted payback period technique
18	18	18	Accounting rate of return and payback period techniques	Day 18	<ul style="list-style-type: none"> Management, M. Y. Khan & P. K. Jain 	https://www.youtube.com/watch?v=g6UCv4rkZ_Y		<ul style="list-style-type: none"> Able to understand and apply accounting rate of return and payback period techniques

Unit IV – Working Capital Management

19	19	19	Introduction to Working Capital Management	Day 19	<ul style="list-style-type: none"> Financial Management, Comprehensive Text book with Case studies, M. Ravi Kishore, 7thEdition, Taxmann Publications 	https://www.youtube.com/watch?v=R2ndARL3RV4&list=PLLy_2iUCG87BFW5LwV9zFEH5dgS2XQTH5		<ul style="list-style-type: none"> Able to understand the concepts of working capital requirement.
20	20	20	Concept of Gross and Net Working Capital,	Day 20	<ul style="list-style-type: none"> Financial Management, Comprehensive Text book with Case studies, M. Ravi Kishore, 7thEdition, Taxmann Publications 	https://www.youtube.com/watch?v=R2ndARL3RV4&list=PLLy_2iUCG87BFW5LwV9zFEH5dgS2XQTH5		<ul style="list-style-type: none"> Understand the significance of net and gross working capital.
21	21	21	Significance, determinants and optimum working capital	Day 21	<ul style="list-style-type: none"> Financial Management, Comprehensive Text book with Case studies, M. Ravi Kishore, 7thEdition, Taxmann Publications 	https://www.youtube.com/watch?v=R2ndARL3RV4&list=PLLy_2iUCG87BFW5LwV9zFEH5dgS2XQTH5		<ul style="list-style-type: none"> Developed the fundamental understanding about optimum working capital
22	22	22	Operating working capital cycle	Day 22	<ul style="list-style-type: none"> Financial Management, Comprehensive Text book with Case studies, M. Ravi Kishore, 7thEdition, Taxmann Publications 	https://www.youtube.com/watch?v=R2ndARL3RV4&list=PLLy_2iUCG87BFW5LwV9zFEH5dgS2XQTH5		<ul style="list-style-type: none"> Can understand the significance of operating working capital cycle.
23	23	23	Working Capital Approaches	Day 23	<ul style="list-style-type: none"> Financial Management, Comprehensive Text book with Case studies, M. Ravi Kishore, 7thEdition, 	https://www.youtube.com/watch?v=R2ndARL3RV4&list=PLLy_2iUCG87BFW5LwV9zFEH5dgS2X	Principal College of Engineering & Management Khandala, Katol Road Nagpur-441501	<ul style="list-style-type: none"> Can understand the approach followed by the company about the working

					Taxmann Publications	QTH5		capital
24	24	24	Estimation and Calculations of Working Capital requirements	Day 24	<ul style="list-style-type: none"> Financial Management, Comprehensive Text book with Case studies, M. Ravi Kishore, 7thEdition, Taxmann Publications 	https://www.youtube.com/watch?v=R2ndARL3RV4&list=PLLy_2iUCG87BFW5LwV9zFEH5dgS2XQTH5		<ul style="list-style-type: none"> Able to find out the working capital requirement
Unit V - Dividend Policy								
25	25	25	Introduction to dividend decision and value of firm	Day 25	<ul style="list-style-type: none"> Management, M. Y. Khan & P. K. Jain 	https://www.youtube.com/watch?v=G0KagC5UA7o		<ul style="list-style-type: none"> Able to understand the dividend decision and value of the firm is determined.
26	26	26	Significance and type of dividend policy	Day 26	<ul style="list-style-type: none"> Financial Management, Comprehensive Text book with Case studies, M. Ravi Kishore, 7thEdition, Taxmann Publications 	https://www.youtube.com/watch?v=G0KagC5UA7o		<ul style="list-style-type: none"> Can understand its significance and its various types
27	27	27	Forms of dividend policy, determinants and constraints of dividend decisions.	Day 27	<ul style="list-style-type: none"> Financial Management: Theory and Practice, Prasanna Chandra, 	https://www.youtube.com/watch?v=G0KagC5UA7o		<ul style="list-style-type: none"> Able to analyse the various factor which plays important role in determining dividend policy
28	28	28	Irrelevance theory i.e. M.M. approach	Day 28	<ul style="list-style-type: none"> Financial Management, Theory Concepts and Problems - R.P. Rustagi 	https://www.youtube.com/watch?v=G0KagC5UA7o	C1-C10	<ul style="list-style-type: none"> Able to understand how dividend is not relevant for market value
29	29	29	Relevance theory i.e. Walter's model	Day 29	<ul style="list-style-type: none"> Management, M. Y. Khan & P. K. Jain 	https://www.youtube.com/watch?v=G0KagC5UA7o		<ul style="list-style-type: none"> Able to understand how dividend is relevant for market value
30	30	30	Relevance theory i.e. Gordon's model	Day 30	<ul style="list-style-type: none"> Management, M. Y. Khan & P. K. Jain 	https://www.youtube.com/watch?v=G0KagC5UA7o		<ul style="list-style-type: none"> Able to understand how dividend is relevant for market value

Total number of lectures as per syllabus: - 30

Total number of lectures as per planned: - 30

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Tutorial Plan

Week	Topic	No. Of Problems	Mapped With CO
1	Cost of Capital	08	
2	Leverage	07	
3	Capital budgeting	08	
4	Working Capital Management	10	
5	Dividend Policy	08	

Assignment Plan

Assignment No.	Topic	Given Date	Submission Date	Mapped With CO
1	Cost of Capital and leverage			
2	Capital Budgeting, working capital and Dividend policy			

Content Beyond Syllabus Topic – Planned

Sr. No.	Content Beyond Syllabus Topic	Date Given	Mapped with CO's not covered in TP
1	Practical application of theoretical topics.		
2	Role play.		

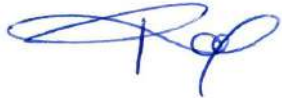
Text Books / Reference Books:

Code	Title of the Book	Author Name/Designation/ Organization	Publisher	Edition/ Publication Year
T1	Financial Management, Theory Concepts and Problems,	R.P. Rustagi	Taxmann Publication	5 th Edition
T2	Financial Management	M. Y. Khan & P. K. Jain	McGraw Hill Publications	6 th Edition
T3	Financial Management, Comprehensive Text book with Case studies	M. Ravi Kishore,	Taxmann Publications	7 th Edition

T4	Financial Management: Theory and Practice,	Prasanna Chandra	Taxmann Publication	9 th Edition
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Company/Industry:

Code	Company/Industry Name	Website	Detailed Information
C1	All Company.		Finance Manager in all the companies significantly go through the crucial process and adopt some modern techniques essentially keeping in mind the goal of wealth maximization. For that a finance manager must have the knowledge of the topics of cost of capital, leverage, and capital budgeting, working capital and dividend policy.



Subject Teacher

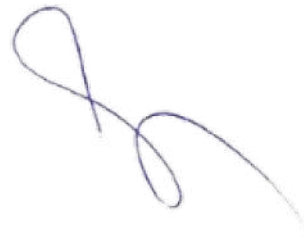


Academic In-charge



HOD (MBA)

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