

OUTCOME BASED LEARNING SAMPLE COPIES



INDIRA GANDHI INSTITUTE OF TECHNOLOGY, SARANG

ଇନ୍ଦିରା ଗାନ୍ଧୀ ବୈଷୟିକ ଅନୁଷ୍ଠାନ, ସରାଙ୍ଗ

**An Autonomous Institute of Govt. of Odisha
Department of Electronics and Telecommunication Engineering**

COURSE FILE

NAME OF THE COURSE: Internet of Things (IoT)

Academic year the course is taught: 2018-2019

COURSE CODE: PCP7H007 (3L-0T-0P)

YEAR & SEMESTER: 4th Year & 7th Semester

BRANCH: Electronics & Telecommunication Engineering

MAX MARKS: 50 (Internal) + 100 (External)

Course Instructor: Prof. Urmila Bhanja

Professor

Department of ETC Engineering

Contact no: 9437142056

Email Id: urmila@igitsarang.ac.in

Vision

- ❖ To be a place of academic excellence in frontier areas of Electronics and Telecommunication Engineering.
- ❖ To create an educational environment and be a part of nationally acclaimed department so as to meet the challenges by bridging the gap between academia and industry.
- ❖ To promote competitive academic programs through research activities and ambience that supports intellectual growth and skill acquisition.

Mission

M1: To grow as a diverse, socially responsible learning community to provide well equipped innovators, Scientists, Engineers with pioneering expertise, entrepreneurs, academicians and thinkers of tomorrow in the field of electronics and telecommunication engineering.

M2: Facilitating improve technologies, bringing out vital services to the society by strengthening quality of life with leadership and self-sufficiency. To sustain enthusiasm among the students for an approach towards nation building.

M3: To inculcate the spirit of innovation among the aspirants' technologists.

Program Educational Objectives (PEOs)

PEO I: The key objective of Electronics and Telecommunication Engineering Program is to augment Student's ability through quality technical education.

PEO II: To impart domain knowledge required by the industries so that students are readily deployable.

PEO III: To ensure an environment where students, faculty and staffs are encouraged to enhance their intellectual inquisitiveness and develop their technical as well as professional expertise through continuous developmental programs.

PEO IV: Graduates/postgraduates will interact with their peers from other disciplines in industry and society to contribute the economic growth of the country.

PEO V: Developing communication and interpersonal skills and preparing them for providing self-employment. Growing problem analysis and solving capability through industrial training and projects.

Program Specific Outcomes (PSOs)

1. Gain detailed knowledge of various contemporary domains to identify research.
2. Have strong skills in learning new programming environments as it is used to develop algorithm for software application.

Program Outcomes (POs) Defined by NBA

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

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

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

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

Course description and objectives:

Students will be explored to the interconnection and integration of the physical world and the cyber space. They are also able to design & develop IOT Devices.

COURSE OUTCOME:

1. Able to understand the application areas of IOT.
2. Able to realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks.
3. Able to understand building blocks of Internet of Things and characteristics.

COURSE PREREQUISITES: Knowledge in wireless communication and networks

1. Syllabus: BPUT

B.Tech(ETC/ECE)SyllabusforAdmissionbatch2017-18 7th / 8th semester

PCP7H007

IOT

3-0-0

Course description and objectives:

Students will be explored to the interconnection and integration of the physical world and the cyber space. They are also able to design & develop IOT Devices.

Course Outcomes:

- Able to understand the application areas of IOT
- Able to realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks
- Able to understand building blocks of Internet of Things and characteristics.

Module I

Introduction & Concepts: Introduction to Internet of Things, Physical Design of IOT, Logical Design of IOT, IOT Enabling Technologies, IOT Levels.
Domain Specific IOTs: Home Automation, Cities, Environment, Energy, Retail, Logistics, Agriculture, Industry, Health & Life Style.

Module II

M2M & System Management with NETCONF-YANG: M2M, Difference between IOT and M2M, SDN and NFV for IOT, Software defined Networking, Network Function Virtualization, Need for IOT Systems Management, Simple Network Management Protocol, Limitations of SNMP, Network Operator Requirements, NETCONF, YANG, IOT Systems management with NETCONF-YANG.

Module III

Developing Internet of Things & Logical Design using Python: Introduction, IOT Design Methodology, Installing Python, Python Data Types & Data Structures, Control Flow, Functions, Modules, Packages, File Handling, Date/ Time Operations, Classes, Python Packages

Module IV

IOT Physical Devices & Endpoints: What is an IOT Device, Exemplary Device, Board, Linux on Raspberry Pi, Interfaces, and Programming IOT Devices.

TEXT BOOKS:

1. VijayMadiseti, Arshdeep Bahga, "Internet of Things A Hands-On- Approach", 2014, ISBN:978 0996025515

REFERENCE BOOKS:

1. AdrianMcEwen, "Designing the Internet of Things", Wiley Publishers, 2013, ISBN:978-1-118-43062-0
 2. Daniel Kellmerez, "The Silent Intelligence: The Internet of Things". 2013, ISBN:0989973700
-

2. Student's attendance Sheet (Attached)

3. Evaluation Scheme (BPUT):

Internal -I	Internal-II	Semester Examination	Total
25	25	100	150
First internal test including Assignments, viva, attendance, participation of the students in the class, quiz test (decided by the concerned teacher)	Second internal test including Assignments, viva, attendance, participation of the students in the class, quiz test (decided by the concerned teacher)	Purely based on the written examination score at the university level	GRADE:O ($\geq 90\%$) GRADE: E (80% to 89%) GRADE: A (70% to 79%) GRADE: B (60% to 69%) GRADE: C (50% to 59%) GRADE: D (37% to 49%) GRADE: F (fail) $\leq 37\%$

4. Lesson Plan:

SL.NO.	MODULE/LESSON	BRIEF OUTLINE OF COURSE CONTENT	No of classes/Lecture hours required	Course outcome mapping
1	MODULE I	Introduction & Concepts: Introduction to Internet of Things	(1 class)	CO1
2		Physical Design of IOT, Logical Design of IOT	(1 class)	CO1
3		IOT Enabling Technologies	(2 classes)	CO2
4		IOT Levels. Domain Specific IOTs: Home Automation, Cities, Environment, Energy, Retail, Logistics, Agriculture, Industry, Health & Lifestyle	(6 classes)	CO2
		Assignments in form of presentations and vivas are taken from the students. Students are asked to collect information from Journals/Internet		
5		Total classes in hours	(10classes)	
6	MODULE II	M2M, Difference between IOT and M2M	(1 class)	CO1,CO2
7		SDN and NFV for IOT, Software defined Networking, Network Function Virtualization	(3 classes)	CO1
8		Need for IOT Systems Management, Simple Network Management Protocol	(2 classes)	CO3
9		Limitations of SNMP, Network Operator Requirements	(2 classes)	CO1
10		NETCONF, YANG, IOT Systems management with NETCONF-Yang	(2 classes)	CO1, CO2
		Total classes in hours	(10 classes)	
11	MODULE III	Developing Internet of Things & Logical Design using Python: Introduction, IOT Design Methodology	(4 classes)	CO1,CO2,CO3
12		Installing Python, Python Data Types & Data Structures, Control Flow, Functions, Modules, Packages, File Handling, Date/ Time Operations, Classes, Python Package	(3 classes)	CO1,CO2,CO3
		Students install and practice and questions are asked as viva		
		Total classes in hours	(7 classes)	
13	MODULE IV	IOT Physical Devices & Endpoints: a brief introduction	(1 class)	CO1,CO2,CO3
14		What is an IOT Device, Exemplary Device	(1 class)	CO1,CO2,CO3
15		Board, Linux on Raspberry Pi, Interfaces	(1 class)	CO1,CO2,CO3
16		Programming& IOT Devices	(1 class)	CO1,CO2,CO3
17		Total classes in hours	(4 classes)	

Textbook:

1. VijayMadiseti, Arshdeep Bahga,” Internet of Things A Hands-On- Approach”,2014, ISBN:978 0996025515

Reference books:

1. Adrian McEwen, “Designing the Internet of Things”, Wiley Publishers, 2013, ISBN:978- 1-118-43062-0

2. Daniel Kellmereit, “The Silent Intelligence: The Internet of Things”. 2013, ISBN:098997370

5. Teaching Methodology and Tools used

For delivering the course content power point presentation was made. To clearly explain few at times white board and marker pen were used. PPTs are circulated among the students as class notes at the end of the lectures.

6. Program Outcomes

PO1	Engineering Knowledge
PO2	Problem Analysis
PO3	Design/development of solutions
PO4	Conduct investigations of complex Problems
PO5	Modern tool usage
PO6	The engineer and society
PO7	Environment and sustainability
PO8	Ethics
PO9	Individual and team work
PO10	Communication
PO11	Project management and finance
PO12	Life-long learning

7. Course Outcomes

CO1	Able to understand the application areas of IOT
CO2	Able to realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks
CO3	Able to understand building blocks of Internet of Things and characteristics

CO Attainment:

CO1=2.526

CO2=2.47

CO3=2.53

8. Mapping between course outcomes and program outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	3	2					3		2
CO2	2	2	2	2	2					2		2
CO3	3	2	2	1	1					3		1
Direct Attainment	8	6	5	6	5					8		5
PO Attainment	2.51	2.50	2.50	2.50	2.50	-	-	-	-	2.51	-	2.50

Correlation levels 1, 2 or 3 are defined as below:

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High)

9. Mapping between course outcomes and program specific outcomes

CO	PSO1	PSO2
CO1	2	1
CO2	3	1
CO3	3	1
Direct Attainment	8	3
PSO Attainment	2.86	2.87

Correlation levels 1, 2 or 3 are defined as below:

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High)

10. Terminal-I Question paper (offline)

Sub: IoT, 7th Semester, B. Tech, All questions carry equal marks (any five)

Full Mark: 25, Time: 1hr

Q. No	Answer all the questions	CO	Marks
1	Describe few challenges of IoT? Explain different link layer protocols used in IoT?	CO1	5
2	Briefly explain the difference between REST API and Web Socket API.	CO1, CO2, CO3	5
3	Explain briefly the COAP application layer protocol and mention one of its applications.	CO1, CO2, CO3	5
4	Explain cloud platform as a service. Give one example it.	CO1, CO2, CO3	5
5	Briefly explain a smart forest fire detection system embedded with all the advanced features.	CO1, CO2, CO3	5
6	Write a python program, which includes a function to calculate factorial of a number.	CO1	5
7	Write the output of the following code. What do you understand by instance and attribute? Class Human: def _init_(self, name=None): (self.name=name, def man(self): if self.name: print("Hi, I am a man with a name"+ self.name) else: print("Hi, I am a Robot without a name") x=Human()x.man();y=Human("Ashok")y.man()	CO1	5

11. Terminal -II Question paper (offline)

Sub: IoT, 7th Semester, B. Tech, Full Mark: 25, Time: 1hr

Answer any three. Question no 1. Is compulsory.

Q. No	Answer all the questions	CO	Marks
1.a	Mention three applications of M2M	CO1,CO2	2
1.b	Mention M2M communication protocols	CO1, CO2	2
1.c	Briefly explain the advantages of NFV	CO2, CO3	2
1.d	Differentiate IoT and M2M	CO1, CO3	2
1.e	What are the resources that are mapped to functional devices for home automation IoT system at the deployment level?	CO1, CO3	3
1.f	Explain what are the interfaces are available for Raspberry Pi.	CO2, CO3	2
2.a	Write a Python program for controlling an LED with a switch with Raspberry Pi.	CO1, CO3	3
2.b	Briefly explain limitations of simple network management protocol.	CO3	3
3.a	What is the need of SDN. Briefly explain SDN architecture.	CO3	3

3.b	Explain the protocol layers of NETCONF.	CO3	3
4.a	What are the different data types present in python?	CO3	3
4.b	Write the output of the following code. <pre> name = input ("what is your name?") print("Nice to meet you "+name+"!") age=input("Your age?") print("so,you are already "+age+"years old"+name+"!") </pre>	CO3	3

12.Sample Answer sheets Terminal-1 (hard copy attached)

13.Sample Answer sheet Terminal-II (hard copy attached)

14.Question paper analysis (Terminal-I)

Serial Number	Category (Bloom's Taxonomy)	Question Numbers	Number of questions	Weightage (%)
1	Remembrance	1,2	2	28
2	Understanding	1,2,3,4,6,7	6	85
3	Applications	3,4	2	28
4	Analysis	5	1	14
5	Design	5	1	14

15.Question paper analysis (Terminal-II)

Serial Number	Category (Bloom's Taxonomy)	Question Numbers	Number of questions	Weightage (%)
1	Remembrance	1.e,1.f,2.b,3.a,3.b,4.a	6	50
2	Understanding	1.a, 1.b,1.c,1.d,1.e,2.a,3.b,4.b	8	66
3	Applications	1.b,1.f	1	16
4	Analysis	1	1	8
5	Design	1	1	8

16. Timetable Individual

Department of Electronics and Telecommunication,
Indira Gandhi Institute of Technology, Sarang, Dhenkanal-759146
TT-2018-19(Odd Sem)

Name of the Faculty: Dr. U Bhanja

	1 st	2 nd	3 rd	4 th	5 th	LUNCH	6 th	7 th	8 th
	8.00-8.50AM	8.50-9.40AM	9.40-10.30AM	10.30-11.20AM	11.20-12.10PM		2.00-2.50PM	2.50-3.40PM	3.40-4.30PM
MON					IOT (7 th BT)		Minor Project (7 th BT)		
TUE				IOT (7 th BT)					
WED							Minor Project (7 th BT)		
THU			PROJECT (3 rd Sem MTech)						
FRI							PROJECT (3 rd Sem MTech)		
SAT									

Head of the Department
Electronics and Telecommunication Engineering

17.Terminal mark

Department of Electronics and Telecommunication Engineering Indira Gandhi
Institute of Technology, Sarang, 7th Sem, 2020-21

1/24/2019

Welcome To Biju Patnaik University of Technology



Biju Patnaik University of Technology, Odisha, Rourkela

Welcome IGIT, SARANG Log Out

Skin: Hay

HOME STUDENT ENROLLMENT MY ACCOUNT CORRESPONDENCE FACULTY COLLEGE REGISTRATION REPORT(S) EXAMINATION

Institution Name:	BIJU PATNAIK UNIVERSITY OF TECHNOLOGY, ODISHA
Branch/Sem:	B.Tech.(ELECTRONICS & TELECOMMUNICATION ENGINEERING) / 7
Subject:	PCP7H007 / THEORY / Internet of Things (IOT)

PREVIEW REPORT

Sr.No.	Roll No	Name	Internal Attendance	Internal Marks	Internal In Word	Practical Attendance	Practical Marks	Practical In Word
1	1501105516	ABHISEK BASTIA	P	36	Thirty-Six	NA	NA	NA
2	1501105517	AJIT SAHOO	P	37	Thirty-Seven	NA	NA	NA
3	1501105519	ANIKTA MOHAPATRA	P	45	Forty-Five	NA	NA	NA
4	1501105520	ASISH BEHERA	P	37	Thirty-Seven	NA	NA	NA
5	1501105521	AVEET KUMAR AGARWAL	P	46	Forty-Six	NA	NA	NA
6	1501105523	CHANDAN KUMAR SINGH	P	38	Thirty-Eight	NA	NA	NA
7	1501105524	DEBAJANI NAYAK	P	45	Forty-Five	NA	NA	NA
8	1501105525	DIBYAJYOTI NANDA	P	37	Thirty-Seven	NA	NA	NA
9	1501105526	DILIP KUMAR MANGARAJ	P	42	Forty-Two	NA	NA	NA
10	1501105527	JAGDESH KUMAR NAIK	P	29	Twenty-Nine	NA	NA	NA
11	1501105528	JANMAJAYA PRADHAN	P	47	Forty-Seven	NA	NA	NA
12	1501105529	KUNDAN SIRODHARYA PARDIA	P	28	Twenty-Eight	NA	NA	NA
13	1501105530	MANMAY ROUT	P	50	Fifty	NA	NA	NA
14	1501105531	NIKITA MUNDU	P	46	Forty-Six	NA	NA	NA
15	1501105532	NIKUNI PATEL	P	37	Thirty-Seven	NA	NA	NA
16	1501105534	PINAK KUMAR RATH	P	34	Thirty-Four	NA	NA	NA
17	1501105536	PRASANTI SANTOSH ROY	P	49	Forty-Nine	NA	NA	NA
18	1501105537	RAJAT KUMAR DALAI	P	31	Thirty-One	NA	NA	NA
19	1501105538	ROJALIN MALIK	P	43	Forty-Three	NA	NA	NA
20	1501105539	SAJAN BEHERA	P	34	Thirty-Four	NA	NA	NA
21	1501105540	SAKSHI GATYAN	P	50	Fifty	NA	NA	NA
22	1501105541	SANDEEP KUMAR PATRA	P	40	Forty	NA	NA	NA
23	1501105542	SHAHAMIN RASHID	P	48	Forty-Eight	NA	NA	NA
24	1501105543	SHYAM PRASAD BEHERA	P	37	Thirty-Seven	NA	NA	NA
25	1501105544	SOBHAGINI PANDEY	P	46	Forty-Six	NA	NA	NA
26	1501105545	SOM BISMAYA	P	42	Forty-Two	NA	NA	NA
27	1501105546	SOUMITRI PANDA	P	43	Forty-Three	NA	NA	NA
28	1501105547	SOU MYA RANJAN DALLUA	P	40	Forty	NA	NA	NA
29	1501105548	SUBHASHREE PRIYADARSHINEE	P	48	Forty-Eight	NA	NA	NA
30	1501105550	SUKANYA MAHALIK	P	44	Forty-Four	NA	NA	NA
31	1501105551	SWAGAT ROUT	P	44	Forty-Four	NA	NA	NA
32	1501105552	SWAPNIL ROY	P	47	Forty-Seven	NA	NA	NA
33	1501105553	SWETAPADMA PANDA	P	38	Thirty-Eight	NA	NA	NA
34	1501105554	TUSHAR RANJAN PANDA	P	39	Thirty-Nine	NA	NA	NA
35	1501105555	U.S.VISHAAL	P	32	Thirty-Two	NA	NA	NA
36	1501105556	YASH RANJAN MOHAPATRA	P	35	Thirty-Five	NA	NA	NA
37	1501105557	SANDEEP SAHU	P	43	Forty-Three	NA	NA	NA
38	1501105558	SIDDHESWAR NAHAK	P	46	Forty-Six	NA	NA	NA
39	1501105559	SOURAV SUBUDHI	P	34	Thirty-Four	NA	NA	NA
40	1621105191	ANIMOL AICH	P	41	Forty-One	NA	NA	NA

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1/2

41	1621105193	BIKEN SAHOO	P	32	Thirty-Two	NA	NA	NA
42	1621105198	JYOTIRMAYEE SAMAL	P	40	Forty	NA	NA	NA
43	1621105202	PRAGYAN TANAYA TAPASWINI	P	39	Thirty-Nine	NA	NA	NA
44	1621105203	PRATYUSHA RATH	P	39	Thirty-Nine	NA	NA	NA
45	1621105204	PRYADARSHINI PATRA	P	45	Forty-Five	NA	NA	NA
46	1621105205	PRYANKA DALAI	P	37	Thirty-Seven	NA	NA	NA
47	1621105206	PRYANKA MOHAPATRA	P	40	Forty	NA	NA	NA
48	1621105207	RAJAT SEKHAR NANDA	P	28	Twenty-Eight	NA	NA	NA
49	1621105208	RASMITA BEHERA	P	40	Forty	NA	NA	NA
50	1621105210	SEKH ZABID BOX	P	38	Thirty-Eight	NA	NA	NA
51	1621105211	SK SAJI ULLA	P	35	Thirty-Five	NA	NA	NA
52	1621105213	SONALI SAHOO	P	42	Forty-Two	NA	NA	NA
53	1621105214	SONALIKA SAMAL	P	42	Forty-Two	NA	NA	NA
54	1621105215	SOUMYARANJAN PATTANAIK	P	30	Thirty	NA	NA	NA
55	1621105216	SUBHASHMITA BEHERA	P	44	Forty-Four	NA	NA	NA
56	1621105217	SUBHRA BEHURIA	P	40	Forty	NA	NA	NA
57	1621105218	SUSMITA DAS	P	41	Forty-One	NA	NA	NA
58	1621105220	UDAYA BHASKAR BEHERA	P	35	Thirty-Five	NA	NA	NA
59	1621105221	BUJAYANTI LAKRA	P	40	Forty	NA	NA	NA
60	1621105222	SURYAKANTA SAHANI	P	36	Thirty-Six	NA	NA	NA

18.Semester Mark (a sample copy)



Biju Patnaik University of Technology, Odisha

Welcome!

Login

☒ Regular Subject(s) History ☐ Honor(s)/Minor(s) Subjects History

Reg.No: 1501105542

Name: SHAHAMIN RASHID

College: INDIRA GANDHI INSTITUTE OF TECHNOLOGY, SARANG

Branch: B.Tech.(ELECTRONICS & TELECOMMUNICATION ENGINEERING)



Sl.No.	Subject Code	Subject	Credit	Last History	Final Grade
☐ 1st Semester					
1	15HM3101	ENGLISH COMMUNICATION SKILL	3	2015-16 A	A
2	15BE2103	THERMODYNAMICS	3	2015-16 C	C
3	15BS1101	MATHEMATICS - I	4	2015-16 C	C
4	15BE2101	BASICS OF ELECTRONICS	4	2015-16 E	E
5	15BE2105	PROGRAMMING IN C	5	2015-16 E	E
6	15BS1103	CHEMISTRY	4	2015-16 E	E
7	15BE7102	ENGINEERING WORKSHOP	2	2015-16 O	O
Total Credits :			25		SGPA : 8.12
☐ 2nd Semester					
1	15BS1102	PHYSICS	4	2015-16 A	A
2	15HM3102	BUSINESS COMMUNICATION	3	2015-16 A	A
3	15BE2104	MECHANICS	3	2015-16 C	C
4	15BE2102	BASIC ELECTRICAL ENGINEERING	4	2015-16 E	E
5	15BE2106	DATA STRUCTURE USING C	5	2015-16 E	E
6	15BS1104	MATHEMATICS - II	4	2015-16 O	O
7	15BE7101	ENGINEERING DRAWING	2	2015-16 A	A
Total Credits :			25		SGPA : 8.44
☐ 3rd Semester					
1	PET31001	SEMICONDUCTOR DEVICES	4	2016-17 A	A
2	PET31102	NETWORK THEORY	4	2016-17 A	A
3	PEK3E001	ENGINEERING ECONOMICS	3	2016-17 B	B
4	PET31101	ANALOG ELECTRONIC CIRCUITS	4	2016-17 E	E
5	PET31103	SIGNAL & SYSTEMS	4	2016-17 E	E
6	PET31104	DIGITAL ELECTRONICS	4	2016-17 O	O
Total Credits :			23		SGPA : 8.57
☐ 4th Semester					
Grand Total Credits :			179		CGPA : 8.43

Sl.No.	Subject Code	Subject	Credit	Last History	Final Grade
1	PET4I103	ELECTRICAL AND ELECTRONICS MEASUREMENT	4	2016-17 A	A
2	PET4I102	ELECTRICAL MACHINES & POWER DEVICES	4	2016-17 B	B
3	PET4I104	MICROPROCESSOR & MICROCONTROLLER	4	2016-17 B	B
4	PMA4E001	APPLIED MATHEMATICS-III	3	2016-17 B	B
5	PET4I101	ELECTROMAGNETICS ENGINEERING	4	2016-17 E	E
6	POB4E003	ORGANIZATIONAL BEHAVIOR	3	2016-17 E	E
7	PET4I201	SKILL PROJECT AND HANDS ON	3	2016-17 O	O
Total Credits :			25		SGPA : 8.08
☐ 5th Semester					
1	PET5I101	CONTROL SYSTEMS	4	2017-18 A	A
2	PET5I102	DIGITAL SIGNAL PROCESSING	4	2017-18 A	A
3	PET5I103	ANALOG COMMUNICATION	4	2017-18 A	A
4	PET5H002	DIGITAL VLSI DESIGN	4	2017-18 B	B
5	PET5J001	FIBER OPTICS & OPTOELECTRONICS DEVICES	4	2017-18 E	E
6	PET5I201	ADVANCE LAB - I (VLSI & EMBEDDED SYSTEM LAB)	4	2017-18 O	O
Total Credits :			24		SGPA : 8.33
☐ 6th Semester					
1	PET6I101	DIGITAL COMMUNICATION	4	2017-18 A	A
2	PET6J002	COMPUTER NETWORK AND DATA COMMUNICATION	4	2017-18 A	A
3	PMG6M001	ENVIRONMENTAL SCIENCE & ENGINEERING	3	2017-18 A	A
4	PET6I102	HIGH FREQUENCY ENGINEERING	4	2017-18 B	B
5	PET6J009	CRYPTOGRAPHY & NETWORK SECURITY	4	2017-18 E	E
6	PEN6E101	BUSINESS COMMUNICATION & SKILL FOR INTERVIEW	3	2017-18 O	O
7	PET6H301	INDUSTRIAL LECTURE #	1	2017-18 O	O
8	PMC6F201	YOGA	1	2017-18 O	O
Total Credits :			24		SGPA : 8.42
☐ 7th Semester					
1	PCP7H012	MARKETING MANAGEMENT	3	2018-19 A	A
2	PET7J003	DIGITAL IMAGE PROCESSING	3	2018-19 A	A
3	PCP7H007	INTERNET OF THINGS (IOT)	3	2018-19 E	E
4	PET7J007	WIRELESS SENSOR NETWORKS	3	2018-19 E	E
5	PET7N201	SEMINAR	2	2018-19 O	O
6	PET7N202	MINOR PROJECT	4	2018-19 O	O
Total Credits :			18		SGPA : 9
☐ 8th Semester					
1	PET8J002	BIOMEDICAL SIGNAL PROCESSING	3	2018-19 A	A
2	PCP8H001	ENTREPRENEURSHIP DEVELOPMENT	3	2018-19 C	C
3	PET8N201	SEMINAR	2	2018-19 O	O
4	PET8N202	MAJOR PROJECT	7	2018-19 O	O
Total Credits :			15		SGPA : 8.8
Grand Total Credits:			179		CGPA : 8.43

Roll No.		Reg. No.		Name of the Student		10 th										11 th										12 th										13 th										14 th										15 th										16 th										17 th										18 th										19 th										20 th										21 th										22 th										23 th										24 th										25 th										26 th										27 th										28 th										29 th										30 th										31 th										32 th										33 th										34 th										35 th										36 th										37 th										38 th										39 th										40 th										41 th										42 th										43 th										44 th										45 th										46 th										47 th										48 th										49 th										50 th										51 th										52 th										53 th										54 th										55 th										56 th										57 th										58 th										59 th										60 th										61 th										62 th										63 th										64 th										65 th										66 th										67 th										68 th										69 th										70 th										71 th										72 th										73 th										74 th										75 th										76 th										77 th										78 th										79 th										80 th										81 th										82 th										83 th										84 th										85 th										86 th										87 th										88 th										89 th										90 th										91 th										92 th										93 th										94 th										95 th										96 th										97 th										98 th										99 th										100 th									
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CO	PSO1	PSO2
CO1	2	1
CO2	3	1
CO3	3	1
	2.86	2.87

- ## **21. Concluding Remarks of the course by the instructor**
- Lecture was delivered fully through the offline platform including all the examinations.
 - Students attended the class in offline mode.

- Lecture notes were distributed among the students.
- White board and Marker pen were used to further explain the Python Module.
- Students practice the python programs available through open-source platform.
- Mapping of the course outcomes and certain program outcomes match well.
- The course is to be redesigned further to match with certain program outcomes.
- Overall, the course module was completed successfully.



INDIRA GANDHI INSTITUTE OF TECHNOLOGY, SARANG

ଇନ୍ଦିରା ଗାନ୍ଧୀ ବିଶ୍ୱବିଦ୍ୟାଳୟ, ସରାଙ୍ଗ

**An Autonomous Institute of Govt. of Odisha
Department of Electronics and Telecommunication Engineering**

COURSE FILE

Name of the Course: Computer Network and Data Communication (CNDC)

Academic year the course is taught: 2018-2019

Course Code: PET6J002 (4L-0T-0P)

Year & Semester: 3rd Year & 6th Semester

Branch: Electronics & Telecommunication Engineering

Max Marks: 50 (Internal) + 100 (External)

Course Instructor: Prof. Urmila Bhanja
Professor
Department of ETC Engineering
Contact no: 9437142056
Email Id: urmila@igitsarang.ac.in

Vision

- ❖ To be a place of academic excellence in frontier areas of Electronics and Telecommunication Engineering.
- ❖ To create an educational environment and be a part of nationally acclaimed department so as to meet the challenges by bridging the gap between academia and industry.
- ❖ To promote competitive academic programs through research activities and ambience that supports intellectual growth and skill acquisition.

Mission

M1: To grow as a diverse, socially responsible learning community to provide well equipped innovators, Scientists, Engineers with pioneering expertise, entrepreneurs, academicians and thinkers of tomorrow in the field of electronics and telecommunication engineering.

M2: Facilitating improve technologies, bringing out vital services to the society by strengthening quality of life with leadership and self-sufficiency. To sustain enthusiasm among the students for an approach towards nation building.

M3: To inculcate the spirit of innovation among the aspirants' technologists.

Program Educational Objectives (PEOs)

PEO I: The key objective of Electronics and Telecommunication Engineering Program is to augment Student's ability through quality technical education.

PEO II: To impart domain knowledge required by the industries so that students are readily deployable.

PEO III: To ensure an environment where students, faculty and staffs are encouraged to enhance their intellectual inquisitiveness and develop their technical as well as professional expertise through continuous developmental programs.

PEO IV: Graduates/postgraduates will interact with their peers from other disciplines in industry and society to contribute the economic growth of the country.

PEO V: Developing communication and interpersonal skills and preparing them for providing self-employment. Growing problem analysis and solving capability through industrial training and projects.

Program Specific Outcomes (PSOs)

1. Gain detailed knowledge of various contemporary domains to identify research.
2. Have strong skills in learning new programming environments as it is used to develop algorithm for software application.

Program Outcomes (POs) Defined by NBA

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

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

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

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

Course description and objectives:

The course makes the students explore data communication, OSI model, TCP/IP model of local area network and LAN wireless network.

COURSE OUTCOME:

1. Able to understand in detail about different layers of OSI and TCP/IP model.
2. Able to realize error control, flow control and media access control protocols.
3. To learn the services provided to the end users.

COURSE PREREQUISITES: Knowledge in analog and digital communications

1. Syllabus: BPUT

PET6J002 COMPUTER NETWORK AND DATA COMMUNICATION

Module – I (12 Hrs)

Overview of Data Communication Networks, Protocols and standards, OSI Reference model, TCP/IP Protocol.

Physical Layer: Analog Signals, Digital Signals, Data Rate Limits, Transmission Impairment, Data rate limit, Digital Transmission: Digital-to-Digital conversion, Analog-to-Digital conversion, Transmission modes, Analog Transmission: Digital-to-Analog conversion, Analog-to-Analog conversion, Multiplexing: Frequency Division Multiplexing (FDM), Wave Division Multiplexing (WDM), Time Division Multiplexing (TDM), Transmission Media: Guided Media (Twisted-Pair Cable, Coaxial Cable and Fiber-Optic Cable) and unguided media (wireless), Switching: Circuit Switched Network, Datagram Network, Virtual-Circuit Network, Telephone Network, Dial-up Modems and Digital Subscriber Lines.

Module – II (10 Hrs)

Error Detection and correction: Types of Errors, Error Detection mechanism (Linear codes, CRC, Checksum), Error Correction mechanism: Hamming Encoding.

Data Link Control and Protocols: Flow and Error Control, Stop-and-Wait ARQ, Go-Back-N ARQ, Selective Repeat ARQ, HDLC and Point-to-Point Protocol.

Multiple Access: Random Access (ALOHA, CSMA, CSMA/CD, CSMA/CA), Controlled Access (Polling, Reservation, Token Passing), Channelization (FDMA, TDMA, CDMA).

Wired LANs (Ethernet): Traditional Ethernet, Fast Ethernet, Gigabit Ethernet.

Module – III (10 Hrs)

Wireless LANs: IEEE 802.11 and Bluetooth.

Connecting Devices: Passive Hub, Repeater, Active Hub, Bridge, Two layers Switch, Router, Three layers Switch, Gateway.

Virtual Circuit Networks: Frame Relay, Architecture & layers, ATM: Design goals, Architecture & layers.

Network Layer: IPV4 addresses, IPV6 addresses, Internet Protocol: Internetworking, IPV4 datagram, IPV6 packet format and advantages, Network Layer Protocols: ARP, RARP, IGMP and ICMP, Routing: Unicast Routing Protocols and Multicast Routing Protocols.

Transport Layer: Process to Process Delivery, User Datagram Protocol (UDP) and Transmission Control Protocol (TCP).

Module – IV (08Hrs)

Domain Name System (DNS): Name Space, Domain Name Space, DNS in Internet, Resolution and Dynamic Domain Name System (DDNS), Remote logging, Electronic Mail (SMTP) and file transfer (FTP), WWW: Architecture & Web document, HTTP: Transaction & Persistent vs. Nonpersistent connection.

Introduction to Wi-Fi and Li-Fi Technology.

Text Books:

1. Data Communications and Networking, Behrouz A. Forouzan, Tata McGraw-Hill.
2. Computer Networks, A. S. Tannenbaum, D. Wetherall, Prentice Hall, Imprint of Pearson.
3. Data Communication and Networks, Bhushan Trivedi, Oxford University Press.

Reference Book:

1. Network for Computer Scientists & Engineers, Zheng, Oxford University Press.
2. Computer Networks A system Approach, Larry L. Peterson and Bruce S. Davie, Elsevier.
3. Computer Networks, Natalia Olifer, Victor Olifer, Wiley India.
4. Data and Computer Communications, William Stallings, Prentice Hall, Imprint of Pearson.

2. Student's attendance Sheet (Attached)

3. Evaluation Scheme (BPUT):

Internal -I	Internal-II (online)	Semester Examination	Total
25	25	100	150
First internal test including Assignments, viva, attendance, participation of the students in the class, quiz test (decided by the concerned teacher)	Second internal test including Assignments, viva, attendance, participation of the students in the class, quiz test (decided by the concerned teacher)	Purely based on the written examination score at the university level	GRADE:O ($\geq 90\%$) GRADE: E (80% to 89%) GRADE: A (70% to 79%) GRADE: B (60% to 69%) GRADE: C (50% to 59%) GRADE: D (37% to 49%) GRADE: F (fail) $\leq 37\%$

4. Lesson Plan:

SL.NO.	MODULE/LESSON	BRIEF OUTLINE OF COURSE CONTENT	No of classes/Lecture hours required	Course outcome mapping
1	MODULE I	Introduction & Concepts: Introduction to OSI Model, TCP/IP Model	(4 classes)	CO1
2		Physical layer in detail	(8 classes)	CO1 CO2
4				
5		Total classes in hours	(12 classes)	
6	MODULE II	Data link layer: Error control	(2 classes)	CO1,CO2
7		Flow Control	(3 classes)	CO1
8		Medium Access Control	(3 classes)	CO3
9		Wired Ethernet LAN	(2 classes)	CO1
		Total classes in hours	(10 classes)	
11	MODULE III	Layer 2 switch, layer 3 switch, Bridges, Gateways Wireless LAN, Bluetooth, IEEE 802.11	6 classes	CO1, CO2, CO3
12		Passive hub, repeaters,	2 classes	CO1, CO2, CO3
		Network layers, TCP, UDP	2 classes	
		Total classes in hours	(10 classes)	
13	MODULE IV	Dynamic domain name system, SMTP	(2 classes)	CO1, CO2, CO3
14		SMTP, FTP, HTTP	(2 classes)	CO1, CO2, CO3
15		Introduction to WiFi and LiFi Technology	(4 classes)	CO1, CO2, CO3
16				CO1, CO2, CO3
17		Total classes in hours	(8 classes)	

Text Books:

1. Data Communications and Networking, Behrouz A. Forouzan, Tata McGraw-Hill.
2. Computer Networks, A. S. Tannenbum, D. Wetherall, Prentice Hall, Imprint of Pearson.
3. Data Communication and Networks, Bhushan Trivedi, Oxford University Press.

Reference Book:

1. Network for Computer Scientists & Engineers, Zheng, Oxford University Press.
2. Computer Networks A system Approach, Larry L. Peterson and Bruce S. Davie, Elsevier.
3. Computer Networks, Natalia Olifer, Victor Olifer, Willey India.
4. Data and Computer Communications, William Stallings, Prentice Hall, Imprint of Pearson.

5. Teaching Methodology and Tools used

For delivering the course content power point presentation was made. Few at times white board and marker pen were used for detail explanation of the students. PPTs are circulated among the students as class notes at the end of the lectures. The class was held offline completely, and the examination was conducted under BPUT.

Program Outcomes

PO1	Engineering Knowledge
PO2	Problem Analysis
PO3	Design/development of solutions
PO4	Conduct investigations of complex Problems
PO5	Modern tool usage
PO6	The engineer and society
PO7	Environment and sustainability
PO8	Ethics
PO9	Individual and team work
PO10	Communication
PO11	Project management and finance
PO12	Life-long learning

6. Course Outcomes

CO1	Able to understand in detail about different layers of OSI and TCP/IP model.
CO2	Able to realize error control, flow control and media access control protocols.
CO3	To learn the services provided to the end users.

CO Attainment:

CO1=2.41

CO2=2.41

CO3=2.36

7. Mapping between course outcomes and program outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2		3						3		
CO2	2	2		2						2		
CO3	3	2	2	1	1					3		
Direct Attainment	8	6	2	6	1					8		
PO Attainment	2.39	2.39	2.36	2.41	2.36	-	-	-	-	2.39	-	

Correlation levels 1, 2 or 3 are defined as below:

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High)

8. Mapping between course outcomes and program specific outcomes

CO	PSO1	PSO2
CO1	1	
CO2	3	1
CO3	2	1
Direct Attainment	6	2
PSO Attainment	2.39	2.38

Correlation levels 1, 2 or 3 are defined as below:

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High)

9. Terminal-I Question paper (offline) Answer all questions

Sub: CNDC, 6th Semester, B. Tech, Full Mark: 30, Time: 1hr

Q. No	Answer all the questions	CO	Marks
1	Briefly describe the functions of data link layer?	CO2, CO3	2
2	Describe briefly the most efficient flow control mechanism?	CO2, CO3	5
3	What is the required bandwidth of a low-pass channel if we need to send 1 Mbps by using baseband transmission?	CO1, CO2, CO3	3
4	The loss in a cable with 0.3 dB/km has a power of 2 mW, what is the power of the signal at 5 km	CO1, CO2	3
5	Discuss the types of line encoding used in local area network?	CO1, CO2	2

6	We need to send 265 kbps over a noiseless channel with a bandwidth of 20 kHz. How many signal levels do we need?	CO1, CO2	3
7	Describe difference between bit rate and baud rate?	CO1, CO2	3
8	Explain the difference among coaxial cable, twisted pair wire and fiber optic cable?	CO1, CO2	5
9	Explain digital subscriber line	CO1, CO2	4

10. Terminal -II Question paper (offline)

Sub: CNDC, 6h Semester, B. Tech, Full Mark: 25, Time: 1hr

Answer any five the questions, All questions carry equal marks.

Q. No	Answer all the questions	CO	Marks
1	How the efficiency of flow control mechanism is improved. Write briefly with examples of pure ALOHA and slotted ALOHA.	CO1, CO2	5
2	Briefly write the advantages of CSMA/CA protocol over the ALOHA and slotted ALOHA protocol.	CO1, CO2	5
3	What is pipelining? In which context it is used in flow control?	CO1, CO2, CO3	5
4	Write down briefly different access techniques that are used in CSMA/CD protocol	CO1, CO2	5
5	Explain and design a CRC (7,4) code. Explain the transmitter and receiver of a CRC (7,4) code	CO1, CO2	5
6	Explain briefly Go back and ARQ protocol. Explain how it improves the flow control over other techniques	CO1, CO2	5
7	What is flow control? Why is it needed? What are the drawbacks of simple Flow and error control techniques	CO1, CO2, CO3	5

11.Sample Answer sheets Terminal-I (hard copy of answer sheets attached)

12.Sample Answer sheet Terminal-II (hard copy of answer sheets attached)

13.Question paper analysis (Terminal-I)

Serial Number	Category (Bloom's Taxonomy)	Question Numbers	Number of questions	Weightage (%)
1	Remembrance	1,2 3.10	4	36
2	Understanding	4,5,6,7,8,9,11	7	63
3	Applications	3-9, 11	8	72
4	Analysis	nil	nil	0
5	Design	nil	nil	0

14.Question paper analysis (Terminal-II)

Serial Number	Category (Bloom's Taxonomy)	Question Numbers	Number of questions	Weightage (%)
1	Remembrance	1-7	7	100
2	Understanding	1-7	7	100
3	Applications	3, 7	2	28
4	Analysis	nil	nil	nil
5	Design	nil	nil	nil

15. Timetable Individual

Department of Electronics and Telecommunication,
Indira Gandhi Institute of Technology, Sarang, Dhenkanal-759146
TT-2018-19(Even Sem)

Name of the Faculty: Dr. Urmila Bhanja

	1 st	2 nd	3 rd	4 th	5 th	LUNCH	6 th	7 th	8 th
	8.00-8.50AM	8.50-9.40AM	9.40-10.30AM	10.30-11.20AM	11.20-12.10PM		2.00-2.50PM	2.50-3.40PM	3.40-4.30PM
MON			M.Tech Project(4 th sem)				MAJOR PROJECT		
TUE					CNDC (6 th BT- RN: H4)		(8 th BT)	M.Tech Project(4 th sem)	
WED		MAJOR PROJECT					MAJOR PROJECT		
THU		(8 th BT)		CNDC (6 th BT- RN: H4)	CNDC (6 th BT- RN: H4)		(8 th BT)	MAJOR PROJECT	
FRI				CNDC (6 th BT- RN: H4)			(8 th BT)	M.Tech Project(4 th sem)	
SAT			M.Tech Project(4 th sem)						

Head of the Department
Electronics and Telecommunication

16. Terminal mark (CNDC)

Department of Electronics and Telecommunication Engineering Indira Gandhi
Institute of Technology, Sarang 7th Sem, 2018-19



Institution Name:	BIJU PATNAIK UNIVERSITY OF TECHNOLOGY, ODISHA
Branch/Sem:	B.Tech.(ELECTRONICS & TELECOMMUNICATION ENGINEERING) / 6
Subject:	PET6J002 / THEORY / COMPUTER NETWORK AND DATA COMMUNICATION

PREVIEW REPORT

Sr.No.	Roll No	Name	Internal Attendance	Internal Marks	Internal In Word	Practical Attendance	Practical Marks	Practical In Word
1	1601105044	ABHISHEK KAR	P	30	Thirty	NA	NA	NA
2	1601105045	ANUMESH SINHA	P	39	Thirty-Nine	NA	NA	NA
3	1601105046	ASHISH KUMAR SAHU	P	39	Thirty-Nine	NA	NA	NA
4	1601105047	ASMEETA PATTANAYAK	P	38	Thirty-Eight	NA	NA	NA
5	1601105048	BASUDEB DASH	P	37	Thirty-Seven	NA	NA	NA
6	1601105049	BIBEKANANDA NAYAK	P	40	Forty	NA	NA	NA
7	1601105050	BISHAL KUMAR SENAPATI	P	33	Thirty-Three	NA	NA	NA
8	1601105051	CHANDAN HEMBRAM MUNDA	P	35	Thirty-Five	NA	NA	NA
9	1601105053	DEKSHA PADHE	P	42	Forty-Two	NA	NA	NA
10	1601105054	KAJOL NAYAK	P	43	Forty-Three	NA	NA	NA
11	1601105055	KRISHNAKANT MOHAPATRA	P	41	Forty-One	NA	NA	NA
12	1601105056	M SASWAT	P	27	Twenty-Seven	NA	NA	NA
13	1601105057	NEELASHA BAA	P	43	Forty-Three	NA	NA	NA
14	1601105059	NIKITA PAL	P	40	Forty	NA	NA	NA
15	1601105060	NISHIGANDHA SETHY	P	40	Forty	NA	NA	NA
16	1601105061	NITU PANDA	P	44	Forty-Four	NA	NA	NA
17	1601105063	PIYUSH ANURAG	P	25	Twenty-Five	NA	NA	NA
18	1601105064	PRATYUSH KUMAR NANDA	P	33	Thirty-Three	NA	NA	NA
19	1601105065	RAJESH KUMAR GUPTA	P	41	Forty-One	NA	NA	NA
20	1601105066	ROHANEET BEHERA	P	25	Twenty-Five	NA	NA	NA
21	1601105067	SAMPURNA PATI	P	42	Forty-Two	NA	NA	NA
22	1601105068	SAMIYAT SAHU	P	43	Forty-Three	NA	NA	NA
23	1601105069	SANJEEV MAJHI	P	31	Thirty-One	NA	NA	NA
24	1601105070	SHARIF MAJHI	P	32	Thirty-Two	NA	NA	NA
25	1601105071	SHIVA SANDHYA SAHOO	P	45	Forty-Five	NA	NA	NA
26	1601105072	SHREYANITA KAR	P	45	Forty-Five	NA	NA	NA
27	1601105073	SOURAV MISHRA	P	27	Twenty-Seven	NA	NA	NA
28	1601105075	SRITAM SHREE	P	41	Forty-One	NA	NA	NA
29	1601105076	STUTI SWAGAT MITRA	P	30	Thirty	NA	NA	NA
30	1601105077	SUBHASIS ROUT	P	40	Forty	NA	NA	NA
31	1601105078	SUCHISMEGHNA BISWAL	P	46	Forty-Six	NA	NA	NA
32	1601105079	SUHAJINI SOREN	P	45	Forty-Five	NA	NA	NA
33	1601105080	SUKANT PRIYADARSAN	P	27	Twenty-Seven	NA	NA	NA
34	1601105081	SWAGAT KUMAR JENA	P	32	Thirty-Two	NA	NA	NA
35	1601105082	SWARAJ KUMAR BARAL	P	44	Forty-Four	NA	NA	NA
36	1601105083	SWARNAPRIYA SABAT	P	39	Thirty-Nine	NA	NA	NA
37	1601105084	TANMAYA KUMAR MEHER	P	39	Thirty-Nine	NA	NA	NA

Sr.No.	Roll No	Name	Internal Attendance	Internal Marks	Internal In Word	Practical Attendance	Practical Marks	Practical In Word
41	1601105088	SEBA PRASAD PANDA	P	37	Thirty-Seven	NA	NA	NA
42	1601105237	SWAYAN PRABA MALLA	P	44	Forty-Four	NA	NA	NA
43	1601105490	PRETY ARPITA PANDA	P	33	Thirty-Three	NA	NA	NA
44	1601105537	HITESH PATNAIK	P	32	Thirty-Two	NA	NA	NA
45	1721105002	SWAYAMSIDHA SWAIN	P	32	Thirty-Two	NA	NA	NA
46	1721105005	ANINDITA RATH	P	33	Thirty-Three	NA	NA	NA
47	1721105038	BREKSHOR SHARMA	P	36	Thirty-Six	NA	NA	NA
48	1721105064	RAJASHREE BEHERA	P	45	Forty-Five	NA	NA	NA
49	1721105066	ANITA MAHALIK	P	43	Forty-Three	NA	NA	NA
50	1721105067	AMULYA BAGE	P	36	Thirty-Six	NA	NA	NA
51	1721105070	SATYANARAYAN SAHOO	P	34	Thirty-Four	NA	NA	NA
52	1721105071	SUDHAKANTA MOHANTY	P	37	Thirty-Seven	NA	NA	NA
53	1721105072	PRATVA NAIK	P	34	Thirty-Four	NA	NA	NA
54	1721105077	BABETA PUHARI	P	39	Thirty-Nine	NA	NA	NA
55	1721105085	SUSHMITA SWAIN	P	43	Forty-Three	NA	NA	NA
56	1721105102	HANNY RANI PRASAD	P	48	Forty-Eight	NA	NA	NA
57	1721105109	SOURAV BOSE	P	28	Twenty-Eight	NA	NA	NA
58	1721105110	MONALISA SAHOO	P	38	Thirty-Eight	NA	NA	NA
59	1721105115	SUCHITRA LENKA	P	42	Forty-Two	NA	NA	NA
60	1721105121	SUMAN BAGE	P	41	Forty-One	NA	NA	NA
61	1721105125	SANGHATI JAGADEV	P	39	Thirty-Nine	NA	NA	NA
62	1721105128	DIPALI RANASINGH	P	44	Forty-Four	NA	NA	NA
63	1721105129	SUNIL KUMAR BEHERA	P	28	Twenty-Eight	NA	NA	NA
64	1721105151	PRATIMA PADHEE	P	46	Forty-Six	NA	NA	NA

17.Semester Marks (A sample copy)



Welcome!

Login

☒ Regular Subject(s) History

☐ Honor(s)/Minor(s) Subjects History

☐ Pending Result's

Reg.No: 1601105055

Name: KRISHNAKANT MOHAPATRA

College: INDIRA GANDHI INSTITUTE OF TECHNOLOGY, SARANG

Branch: B.Tech.(ELECTRONICS & TELECOMMUNICATION ENGINEERING)



Sl.No.	Subject Code	Subject	Credit	Last History	Final Grade
3rd Semester					
1	PEK3E001	ENGINEERING ECONOMICS	3	2017-18 A	A
2	PET3I001	SEMICONDUCTOR DEVICES	4	2017-18 A	A
3	PET3I102	NETWORK THEORY	4	2017-18 B	B
4	PET3I101	ANALOG ELECTRONIC CIRCUITS	4	2017-18 E	E
5	PET3I104	DIGITAL ELECTRONICS	4	2017-18 E	E
6	PET3I103	SIGNAL & SYSTEMS	4	2017-18 O	O
Total Credits :			23	SGPA :	8.52
4th Semester					
1	PET4I102	ELECTRICAL MACHINES & POWER DEVICES	4	2017-18 A	A
2	PET4I103	ELECTRICAL AND ELECTRONICS MEASUREMENT	4	2017-18 A	A
3	POB4E003	ORGANIZATIONAL BEHAVIOR	3	2017-18 A	A
4	PMA4E001	APPLIED MATHEMATICS-III	3	2017-18 B	B
5	PET4I101	ELECTROMAGNETICS ENGINEERING	4	2017-18 E	E
6	PET4I104	MICROPROCESSOR & MICROCONTROLLER	4	2017-18 E	E
7	PET4I201	SKILL PROJECT AND HANDS ON	3	2017-18 O	O
Total Credits :			25	SGPA :	8.44
5th Semester					
1	PET5H002	DIGITAL VLSI DESIGN	4	2018-19 A	A
2	PET5I101	CONTROL SYSTEMS	4	2018-19 E	E
3	PET5I103	ANALOG COMMUNICATION	4	2018-19 E	E
4	PET5J001	FIBER OPTICS & OPTOELECTRONICS DEVICES	4	2018-19 E	E
5	PET5I102	DIGITAL SIGNAL PROCESSING	4	2018-19 O	O
6	PET5I201	ADVANCE LAB - I (VLSI & EMBEDDED SYSTEM LAB)	4	2018-19 O	O
Total Credits :			24	SGPA :	9.17
6th Semester					
1	PET6I102	HIGH FREQUENCY ENGINEERING	4	2018-19 A	A
2	PET6J002	COMPUTER NETWORK AND DATA COMMUNICATION	4	2018-19 A	A
Grand Total Credits:			178	CGPA :	8.80

Sl.No.	Subject Code	Subject	Credit	Last History	Final Grade
3	PCGGC001	GREEN TECHNOLOGIES	4	2018-19 E	E
4	PET6I101	DIGITAL COMMUNICATION	4	2018-19 E	E
5	PET6J009	CRYPTOGRAPHY & NETWORK SECURITY	4	2018-19 E	E
6	PEN6E101	BUSINESS COMMUNICATION & SKILL FOR INTERVIEW	3	2018-19 O	O
7	PET6H301	INDUSTRIAL LECTURE #	1	2018-19 O	O
Total Credits :			24	SGPA : 8.83	
7th Semester					
1	PET7J003	Digital Image Processing	3	2019-20 A	A
2	PET7J007	Wireless Sensor Networks	3	2019-20 B	B
3	PCP7H007	Internet of Things (IoT)	3	2019-20 E	E
4	PCP7H012	Marketing Management	3	2019-20 E	E
5	PET7N201	Seminar	2	2019-20 E	E
6	PET7N202	Minor Project	4	2019-20 E	E
Total Credits :			18	SGPA : 8.5	
8th Semester					
1	PCP8H001	Entrepreneurship Development	3	2019-20 O	O
2	PET8J002	BIO MEDICAL SIGNAL PROCESSING	3	2019-20 O	O
3	PET8N201	SEMINAR	2	2019-20 A	A
4	PET8N202	MAJOR PROJECT	7	2019-20 E	E
Total Credits :			15	SGPA : 9.27	
Grand Total Credits:			178	CGPA : 8.80	

- DISCLAIMER -

- i) The result is provisional and subject to change after post publication and or scrutiny by Biju Patnaik University of Technology, Odisha.
- ii) In case of any typological error or discrepancy, the student is required to report at their respective college for necessary intimation / compliance to the University.
- iii) 'F' - Fail (Grade) in (Int - Internal, Ext - External, Pr - Practical), 'MA' - Misc. Anomalies (Anomalies in Wrong Entry in UMS / Absentee Statement), Answer Booklets Reported, 'MPR' - Malpractice Reported, 'M' denotes Malpractice (Grade Point 0), NE- Not Evaluated for Wrong Remarks or Comments in Answer Booklet, 'NCC' - Non-Credit Course Completion, 'NCU' - Non-Credit Course Uncompleted, RW - Result Withheld for Non-Submission / Receipt of Registered Internal / Sessional / Practical / Theory Marks, 'S' - Absent (Grade Point 0), 'SJ' - Subjudice, 'TR' - Transfer Case, WR- Wrong Registration.
- iv) The university shall not be held responsible for any inadvertent error that may have crept into the results being displayed.

18.CO Attainment

[illegible]

19. Concluding Remarks of the course by the instructor

- Lecture was delivered in offline and examination was conducted in offline mode.
- Students attended the class in offline mode.
- Mapping of the course outcomes and certain program outcomes match well.
- The course is to be redesigned further to match with certain program outcomes.
- Overall, the course module was completed successfully. The syllabus is too heavy to complete it within the time limit of 40 hours. Hence, it is decided to reduce the course content keeping in mind that the course outcomes map well with the program outcomes.
- A portion of the syllabus was given to the students for self-study and assignments.

Course Title:CNDC

			Course Title:CNDC																		
			COURSE OUTCOMES ATTAINMENT																		
Sl. No.	Reg .No	Name of Student	CO1									CO2									
			Internal Exam		University Exam		TOTAL OBTAINED	TOTAL MARKS ATTEMPTED	Percentage (%)	SCORES BASED ON SCALE OF 3	TARGET $\geq 70\%$	Internal Exam		University Exam		TOTAL OBTAINED	TOTAL MARKS ATTEMPTED	Percentage (%)	SCORES BASED ON SCALE OF 3	TARGET $\geq 70\%$	Internal
			TOTAL OBTAINED	TOTAL ATTEMPTED	TOTAL OBTAINED	TOTAL ATTEMPTED						TOTAL OBTAINED	TOTAL ATTEMPTED	TOTAL OBTAINED	TOTAL ATTEMPTED						
1	1501105516	ABHISEK BASTIA	13	18	30	32	45	50	80	3	Y	15	17	24	26	36	43	84	3	Y	12
2	1501105517	AJIT SAHOO	12	15	30	52	42	67	93	3	Y	15	15	15	17	27	32	84	3	Y	17
3	1501105519	ANKITA MOHAPATRA	17	18	32	35	49	53	87	3	Y	17	20	12	30	34	47	73	3	Y	14
4	1501105520	ASISH BEHRA	16	18	28	32	44	50	88	3	Y	12	17	25	30	37	47	78	3	Y	15
5	1501105521	AVEET KUMAR AGARWAL	16	17	28	35	51	52	98	3	Y	16	18	25	34	34	52	66	2		15
6	1501105523	CHANDAN KUMAR SINGH	15	16	26	35	50	51	98	3	Y	14	16	20	25	37	41	91	3	Y	12
7	1501105524	DEBAJANI NAYAK	14	16	25	30	35	46	76	3	Y	16	18	26	28	37	43	86	3	Y	18
8	1501105525	DIBYAJYOTI NANDA	15	18	30	35	45	53	84	3	Y	13	15	20	25	33	40	83	3	Y	16
9	1501105526	DILIP KUMAR MANGARAJ	15	18	29	32	45	50	90	3	Y	17	19	18	25	30	41	73	3	Y	18
10	1501105527	JAGDISH KUMAR NAIK	16	18	21	35	47	53	88	3	Y	15	16	19	25	34	41	83	3	Y	10
11	1501105528	JANMAJAYA PRADHAN	12	16	26	30	33	46	72	3	Y	15	17	20	28	28	45	63	2		19
12	1501105529	KUNDAN SIRODHARYA PARDIA	10	18	17	30	35	48	73	3	Y	7	15	17	25	29	40	73	3	Y	8
13	1501105530	MANMAY ROUT	15	17	25	28	37	45	82	3	Y	13	18	20	25	28	43	66	2		15
14	1501105531	NIKITA MUNDU	18	20	26	32	40	49	82	3	Y	13	18	23	25	31	43	72	3	Y	16
15	1501105532	NIKUNJ PATEL	12	14	21	25	33	39	85	3	Y	14	14	29	31	41	45	91	3	Y	16
16	1501105534	PINAK KUMAR RATH	15	17	30	32	45	49	92	3	Y	12	15	30	32	42	47	89	3	Y	18
17	1501105536	PRASANTI SANTOSH ROY	16	17	23	30	20	24	84	3	Y	15	18	25	29	25	30	83	3	Y	15
18	1501105537	RAJAT KUMAR DALAI	17	19	30	33	40	46	87	3	Y	15	15	15	17	37	40	92	3	Y	15
19	1501105538	ROJALIN MALIK	13	15	20	24	33	39	85	3	Y	18	20	30	31	44	46	96	3	Y	14
20	1501105539	SAJAN BEHERA	12	15	20	30	20	26	78	3	Y	15	15	21	23	32	39	82	3	Y	14
21	1501105540	SAKSHI GATYAN	17	19	40	43	57	62	92	3	Y	15	17	30	31	45	48	93	3	Y	15
22	1501105541	SANDEEP KUMAR PATRA	10	14	30	33	41	47	87	3	Y	10	19	19	23	36	42	86	3	Y	14
23	1501105542	SHAHAMIN RASHID	18	19	29	31	39	44	87	3	Y	11	12	30	33	41	45	91	3	Y	20
24	1501105543	SHYAM PRASAD BEHERA	14	15	20	22	30	34	88	3	Y	13	15	20	30	21	26	81	3	Y	15
25	1501105544	SOBHAGINI PANDEY	18	20	30	42	58	62	94	3	Y	17	20	28	30	45	50	90	3	Y	15
26	1501105545	SOM BISMAYA	17	19	28	45	58	64	91	3	Y	10	14	27	29	37	43	86	3	Y	17
27	1501105546	SOUMITRI PANDA	13	15	30	44	50	56	89	3	Y	14	16	20	22	27	32	84	3	Y	18
28	1501105547	SOUMYA RANJAN DALUA	16	18	29	31	45	49	92	3	Y	15	17	15	19	30	36	83	3	Y	11
29	1501105548	SUBHASHREE PRIYADARSHINEE	18	20	20	22	30	35	86	3	Y	15	15	31	40	21	27	78	3	Y	17
30	1501105550	SUKANYA MAHALIK	15	17	25	32	45	49	92	3	Y	14	26	20	29	39	55	71	3	Y	17
31	1501105551	SWAGAT ROUT	12	15	28	47	56	62	90	3	Y	18	20	29	31	47	51	92	3	Y	17
32	1501105552	SWAPNIL ROY	11	19	35	47	62	66	94	3	Y	10	11	19	21	29	32	91	3	Y	18
33	1501105553	SWETAPADMA PANDA	13	15	20	22	27	32	84	3	Y	13	16	20	22	30	50	60	2		10
34	1501105554	TUSHAR RANJAN PANDA	18	20	27	42	51	57	89	3	Y	13	14	24	34	43	48	90	3	Y	15
35	1501105555	U.S.VISHAAL	13	19	21	43	56	62	90	3	Y	15	17	14	30	32	47	68	3	Y	12
36	1501105556	YASH RANJAN MOHAPATRA	13	16	30	34	40	45	89	3	Y	14	15	15	17	26	30	87	3	Y	15
37	1501105557	SANDEEP SAHU	15	17	19	43	40	46	87	3	Y	14	17	31	37	28	32	88	3	Y	15

38	1501105558	SIDDHESWAR NAHAK	13	15	30	45	51	59	86	3	Y	15	15	25	27	37	42	88	3	Y	14
39	1501105559	SOURAV SUBUDHI	14	16	28	44	54	60	90	3	Y	15	19	12	17	23	28	82	3	Y	15
40	1621105191	ANMOL AICH	13	14	30	33	41	47	87	3	Y	14	17	15	28	41	45	91	3	Y	14
41	1621105193	BIKEN SAHOO	15	18	31	42	56	60	93	3	Y	15	18	21	24	38	42	90	3	Y	11
42	1621105198	JYOTIRMAYEE SAMAL	10	19	21	45	58	64	91	3	Y	11	13	20	30	38	43	88	3	Y	17
43	1621105202	PRAGYAN TANAYA TAPASWINI	11	19	21	33	47	52	90	3	Y	11	14	19	30	39	44	89	3	Y	14
44	1621105203	PRATYUSHA RATH	14	15	10	30	42	45	93	3	Y	12	12	14	33	40	45	89	3	Y	11
45	1621105204	PRIYADARSHINI PATRA	12	13	19	30	39	43	91	3	Y	14	16	20	23	31	36	86	3	Y	15
46	1621105205	PRIYANKA DALAI	11	12	15	23	34	35	97	3	Y	12	20	18	50	64	70	91	3	Y	13
47	1621105206	PRIYANKA MOHAPATRA	15	17	19	31	44	48	92	3	Y	12	14	20	23	31	37	84	3	Y	14
48	1621105207	RAJAT SEKHAR NANDA	10	13	20	42	50	55	91	3	Y	17	19	28	30	45	49	92	3	Y	13
49	1621105208	RASMITA BEHERA	16	18	21	24	37	42	88	3	Y	10	11	20	43	51	54	94	3	Y	11
50	1621105210	SEKH ZABID BOX	12	15	31	43	53	58	91	3	Y	14	13	11	24	33	37	89	3	Y	15
51	1621105211	SK SAFI ULLA	15	17	30	33	45	50	90	3	Y	13	15	25	27	37	42	88	3	Y	15
52	1621105213	SONALI SAHOO	14	16	19	21	33	37	89	3	Y	13	16	27	29	40	45	89	3	Y	14
53	1621105214	SONALIKA SAMAL	15	19	20	29	45	48	94	3	Y	17	18	15	44	58	62	93	3	Y	11
54	1621105215	SOUMYARANJAN PATTANAIAK	15	17	19	32	45	49	92	3	Y	12	14	17	19	29	33	88	3	Y	13
55	1621105216	SUBHASMITA BEHERA	15	18	17	19	28	34	82	3	Y	13	14	15	34	43	48	90	3	Y	16
56	1621105217	SUBHRA BEHURIA	13	20	17	25	38	45	84	3	Y	12	15	21	45	53	60	88	3	Y	14
57	1621105218	SUSMITA DAS	15	16	20	24	30	37	81	3	Y	15	20	23	17	23	26	88	3	Y	12
58	1621105220	UDAYA BHASKAR BEHERA	14	18	28	41	50	55	91	3	Y	13	15	20	27	37	42	88	3	Y	14
59	1621105222	SURYAKANTA SAHANI	15	17	20	44	56	61	92	3	Y	17	19	15	25	38	44	86	3	Y	11
60	1601105221	BIJAYANTI LAKRA	14	16	28	41	52	57	91	3	Y	10	12	20	22	30	34	88	3	Y	16
									SUM	180									SUM	200	
									ATT.SCORE	2.4									ATT.SCORE	2.6	

CO3							
I Exam	University Exam		TOTAL OBTAINED	TOTAL MARKS ATTEMPTED	Percentage (%)	SCORES BASED ON SCALE OF 3	TARGET $\geq$ 70%
TOTAL ATTEMPTED	TOTAL OBTAINED	TOTAL ATTEMPTED					
15	15	18	23	33	70	3	Y
20	24	27	39	47	83	3	Y
18	25	30	36	45	80	3	
15	12	25	24	40	60	2	
18	16	28	37	43	86	3	Y
18	22	28	35	46	76	3	Y
20	19	22	30	41	73	3	Y
17	18	26	37	43	86	3	Y
20	26	30	38	41	92	3	Y
16	15	30	38	41	92	3	Y
20	25	31	29	43	67	2	
17	13	20	25	37	67	2	
15	17	20	27	35	77	3	Y
20	22	25	33	40	82	3	Y
18	19	24	35	44	76	3	Y
19	25	33	46	52	88	3	Y
15	20	30	29	32	91	3	Y
18	15	29	25	42	60	2	
16	29	31	43	47	91	3	Y
16	19	21	22	26	85	3	Y
18	19	23	29	35	83	3	Y
17	27	43	55	60	92	3	Y
20	20	30	20	25	80	3	Y
18	30	34	40	45	89	3	Y
17	20	23	30	36	83	3	Y
19	21	26	39	45	87	3	Y
20	10	14	20	28	71	3	Y
13	17	19	27	32	84	3	Y
20	20	25	28	35	80	3	Y
20	24	29	35	43	78	3	Y
18	10	27	32	45	71	3	Y
20	15	29	33	49	67	2	
12	19	23	29	35	83	3	Y
17	10	15	17	24	71	3	Y
14	23	27	35	41	78	3	Y
17	24	27	39	46	85	3	Y
17	20	24	25	31	81	3	Y

16	14	16	28	36	78	3	Y
20	10	27	36	39	92	3	Y
16	12	15	26	31	84	3	Y
15	15	31	38	46	83	3	Y
22	17	25	41	47	87	3	Y
16	19	24	36	40	90	3	Y
13	21	25	31	38	82	3	Y
17	20	24	31	38	82	3	Y
18	12	26	36	44	82	3	Y
14	20	25	30	39	77	3	Y
19	11	15	29	34	85	3	Y
19	18	30	44	49	90	3	Y
17	27	29	42	46	91	3	Y
15	14	27	25	40	63	2	
15	13	17	26	32	81	3	Y
14	21	25	32	39	82	3	Y
15	21	35	44	50	88	3	Y
20	32	35	44	50	88	3	Y
17	20	30	42	47	93	3	Y
15	24	28	34	40	85	3	Y
17	11	19	30	36	83	3	Y
12	23	30	37	42	88	3	Y
19	11	15	28	34	82	3	Y
					SUM	196	
					ATT.CSORE	2.6	