

# GOVERNMENT POLYTECHNIC CHHAPRA



COURSE FILE (Lecture Plan)  
OF  
**COMPUTER HARDWARE & NETWORKING**  
**(2018502)**

Faculty Name:  
Prof. Jitendra Gupta  
(Lecturer)

**DEPARTMENT OF COMPUTER SCIENCE ENGG.**

**STATE BOARD OF TECHNICAL EDUCATION**

Bihar, Patna



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विज्ञान एवं प्रावैधिकी विभाग  
Department of Science and Technology  
Government of Bihar

# CONTENTS

1. Cover Page & Content
2. Vision of the Department
3. Mission of the department
4. Course Description & Course objectives
5. Course Syllabus
6. Reference Materials
7. Course outcomes (CO's)
8. Time table
9. Student list
10. Lecture Plan

# Department of Computer Science

## Vision

This course will allow students to develop background knowledge as well as core expertise in computer hardware and networking, which is one of the fastest growing technologies in our culture today. It forms an integral part of the modern Information Technology. Starting from Intranet in small offices to the global Internet, principles of data communication and networking play an important role.

## Mission

At the end of the course, the students will be able to know:

- Evolution of computer hardware and networking up to the internet
- Principles of computer hardware, channel characteristics, signaling, modulation and encoding
- Various transmission media, their comparative study, fiber optics and wireless communication in details
- Categories and topologies of networks
- OSI model vis-à-vis TCP/IP architecture
- Multiplexing, channel error detection and correction, data link protocols
- Ethernet and token ring, X.25 ATM, BISDN
- Details of IP operations in the INTERNET and associated routing principles
- Operation of optical networks, satellite networks and wireless mobile systems
- Strategies for securing network application using cryptography
- Emerging technologies such as SONET, FDDI, mobile telephony etc.

## **Course Description:-**

In the rapidly growing digital world, role of COMPUTER HARDWARE & NETWORKING is increasingly vital in various domains such as industrial and home automation, entertainment systems, medical equipment's and many more. It forms an integral part of the modern Information Technology. Starting from Intranet in small offices to the global Internet, principles of data communication and networking play an important role Course Objectives:-

1. To have knowledge about the basic working of an Computer system and its Network programming.
2. To provide experience to integrate hardware and software for better understanding of functionalities.

## Course Syllabus

### COMPUTER HARDWARE & NETWORKING (Computer Science)

<b>Subject Code 2018502</b>	<b>Theory</b>			No. of period in One Session :- 42			<b>Credits  03</b>
	<b>No. of Periods Per Week</b>			<b>Full Marks</b>	<b>:</b>	<b>100</b>	
	<b>L</b>	<b>T</b>	<b>P/S</b>	<b>ESE</b>	<b>:</b>	<b>70</b>	
	<b>03</b>	<b>-</b>	<b>-</b>	<b>TA</b>	<b>:</b>	<b>10</b>	
	<b>-</b>	<b>-</b>	<b>-</b>	<b>CT</b>	<b>:</b>	<b>20</b>	

- B) Course Objectives :-** This course will allow students to develop background knowledge as well as core expertise in computer hardware and networking, which is one of the fastest growing technologies in our culture today. It forms an integral part of the modern Information Technology. Starting from Intranet in small offices to the global Internet, principles of data communication and networking play an important role.

<b>Chapter</b>	<b>Name of the Topic</b>	<b>Hours</b>
<b>Unit I</b>	<b>PC Components and System Board.:-</b> Hardware used for I/P, O/P & inside computer case, system board components used for communication among devices, Software - 3 types of Software, ROM BIOS, OS, application software, Functions of BIOS, The boot process, POST and important beep codes, Know about different connectors, Types of system boards, The CPU & the chipset – CPU form factor, CPU slots and sockets, Different types of RAM, Buses – ISA, MCA, EISA, USB, Firewire, AGP,PCI, Setting the CPU & Bus speeds, CMOS setup and data protection.	<b>08</b>
<b>Unit II</b>	<b>Managing Storage devices:-</b> Know about Semiconductor Memories – RAM, ROM on System Board, Main Memory – SIMMs, DIMMs, Other RAM Technologies, Hard drives – hard drive technology – IDE, EIDE, SCSI, SATA, Hard drive partitions, Trouble-shooting hard drives & data recovery, Optimizing Hard drive – disk clean-up, disk fragmentation. Disk backup.	<b>06</b>
<b>Unit III</b>	<b>Troubleshooting Fundamentals: - Troubleshooting tools –</b> Bootable rescue disk, diagnostic software, virus detection software, Anti-Static tools, Trouble-shooting guidelines – Power system, system board, OS & hard drive, Optical drives, keyboard, Monitor and printer problems, Surge protection & battery backup, Stand by UPS, Inline UPS, Line-interactive UPS, and intelligent UPS	<b>06</b>
<b>Unit IV</b>	<b>Introduction to Networks and LAN components.:-</b> Understand the Overview of Networking, State the Need for Networking, Classification of Networks –LAN,MAN,WAN, List the Hardware and Software Components, Various Network Communication Standards, OSI Reference Model, TCP/IP Reference Model, Know about LAN Cables and Connectors, wireless network adapter, Know about Coaxial Cables, Twisted-Pair Cables, Optical Fiber Cables, and Connectors, Explain LAN Devices, Repeaters, Hubs, Switches, Network Interface Cards (NICs), Routers, Modem, Overview of Network Topologies.Satellite	<b>12</b>
<b>Unit V</b>	Network Addressing and Management:- Introduction to Network Addressing, Components of IP Address, IP Address Classes, IP Subnetting, Classify the two types of Internet Protocol addressing IPv4 and IPv6 and state the need for IPv6, explain classful addressing and classless addressing in IPv4, State the need for protocols in computer networks, Hyper Text Transfer Protocol (HTTP), File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP), Telnet.	<b>10</b>
<b>TOTAL</b>		<b>42</b>

## References:

S. No.	Title	Author(s)	Publisher and Edition with ISBN
1.	Data Communication and Networking,	B. Forouzan	Tata McGraw Hill First Edition, 1999
2.	Data and Communication,	W. Stallings	Prentice Hall of India Sixth Edition, 2002
3.	Computer Networks	A.S. Tanenbaum	Pearson Education Fourth Edition, 2002

## Course outcomes:

After completion of the course, the students will be able to-

- CO-1** Appraise computer systems and its applications for various educational, business, and industrial domain.
- CO-2** Configure different Networking Systems.
- CO-3** Create a physical network according to the given topology and troubleshoot it.
- CO-4** Classify the types of cyber-attack

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Letter No.:...ACAD/  
Date:..... 07.10.2023

**GOVERNMENT POLYTECHNIC CHAPRA**  
**CLASS ROUTINE FOR DIPLOMA 5<sup>th</sup> SEMESTER (Regular)**  
C – Civil Engg.-V, CSE – Computer Science & Engg.-V

w.e.f 09/10/2023

Days/Branch		10:00 – 11:00	11:00 – 12:00	12:00 – 13:00	14:00 – 15:00	15:00 – 16:00	16:00 – 17:00
Mon	C	Design of steel and R.C.C Structure (2015501) (Sunny)	Program Elective-I (2015504) (Pranav)	Water Resources Engineering (2015503) (Sunny)	Estimation & Costing (2015502) (Pranav)	Course Primavera/ 3D Max / Others (2015512) (Sunny)/ Pal	
	CSE	Computer Hardware and Networking (2018502) (JK)	Mobile Computing (2018501) (RS)	Elective-II (2018504) (RS)	Minor Project (2018510) (JK)/ wakil	Elective- I (LAB) (2018507) (JK)/NATS	
Tues	C	Design of steel and R.C.C Structure (2015501) (Sunny)	Program Elective-I (2015504) (Pranav)	Minor Project (2015510) (Sunny)	Estimation & Costing (2015502) (Pranav)	Estimating & Costing Lab (2015506) (Sunny)/ Amresh	
	CSE	Elective-I (2018503) (JK)	Mobile Computing (2018501) (RS)	Elective-II (2018504) (RS)	Minor Project (2018510) (JK)/ wakil	Library	
Wed	C	Design of steel and R.C.C Structure (2015501) (Sunny)	Program Elective-I (2015504) (Pranav)	Minor Project (2015510) (Sunny)	Course Under COE /Swayam/ Others (2015511) (Pranav)	Elective Lab / COE Lab (2000508F) (Pranav)/ CE NATS	
	CSE	Computer Hardware and Networking (2018502) (JK)	Elective-II (2018504) (RS)	Mobile Computing (2018501) (RS)	Library	Open Elective Lab / COE Lab (2018508F) (SK)/ CS NATS	
Thu	C	Water Resources Engineering (2015503) (Sunny)	Elective Lab / COE Lab (2000508F) (Pranav)/ CE NATS		Library		
	CSE	Elective-I (2018503) (JK)	Open Elective / COE (2000505F) (SK)		MOOC/SWAYAM/ PYTHON/KYP (TW)/others moocs (2018511) (JK)	Open Elective Lab / COE Lab (2018508F) (SK)/ Wakil	
Fri	C	Open Elective / COE (2000505F) (Pranav)	Water Resources Engineering (2015503) (Sunny)	Library	Course Under COE /Swayam/ Others (2015511) (Pranav)	Library	
	CSE	Computer Hardware and Networking (2018502) (JK)	Computer Hardware & Networking (LAB) (2018506) (JK)/NATS		MOOC/SWAYAM/ PYTHON/KYP (TW)/ Others moocs (2018511) (JK)	Library	
Sat	C	Open Elective / COE (2000505F) (Pranav)	Estimating & Costing Lab (2015506) (Sunny)/ Amresh		Estimation & Costing (2015502) (Pranav)	Minor Project (2015510) (Sunny)	
	CSE	Elective-I (2018503) (JK)	Elective- I (LAB) (2018507) (JK)/NATS		Library	Minor Project (2018510) (JK)/ wakil	

Co- Academic In-charge

Academic In-charge

Principal

<https://www.gpchhapra.org.in/2023/10/09/regarding-1st-3rd-and-5th-sem-classes-time-table/>

**TIME TABLE**

**FACULTY:- Prof. Jitendra Gupta (Computer Science Engg. Department)**

**GOVERNMENT POLYTECHNIC CHAPRA**  
**CLASS ROUTINE FOR DIPLOMA 5<sup>st</sup> SEMESTER**  
**CS- Computer Science Engg.(CHN)**

	1 <sup>st</sup> 10:00-11:00	2 <sup>nd</sup> 1:00- 12:00	3 <sup>rd</sup> 12:00-1:00		4 <sup>th</sup> 2:00-3:00	5 <sup>th</sup> 3:00-4:00	6 <sup>th</sup> 4:00-5:00
<b>MON</b>	<b>Computer Hardware and Networking (2018502) (Jitendra Gupta)</b>			<b>L U N C H</b>			
<b>TUE</b>							
<b>WED</b>	<b>Computer Hardware and Networking (2018502) (Jitendra Gupta)</b>						
<b>THU</b>							
<b>FRI</b>	<b>Computer Hardware and Networking (2018502) (Jitendra Gupta)</b>	<b>Computer Hardware and Networking (LAB) (2018506) (Jitendra Gupta)</b>					
<b>SAT</b>							



## Student list

### Computer Science Engg. 5<sup>th</sup> Sem.

Roll Number	Name Of the Student
511131821003	RANU KUMAR
511131821004	ABHIMANYU KUMAR
511131821004	ABHIMANYU KUMAR
511131821005	AARYAN KUMAR
511131821006	ANKIT KUMAR
511131821008	Sachchidanand Kumar
511131821012	Ankit Kumar
511131821015	AMAN KUMAR
511131821016	PRIYANKA KUMARI
511131821018	ASHISH RANJAN CHAUDHARY
511131821019	DHIRAJ KUMAR
511131821021	GITANJALI MONI
511131821023	Sandeep Kumar
511131821024	VISHAL RAY
511131821301	Abhishek kumar choubey
511131821601	Ritik Raushan
511131821602	Prince Yadav

## LECTURE PLAN

Topics	Lecture No
Unit-01	01-08
<b>PC Components and System Board:</b> Hardware used for I/P, O/P & inside computer case, system board components used for communication among devices, Software - 3 types of Software, ROM BIOS, OS, application software, Functions of BIOS, The boot process, POST and important beep codes, Know about different connectors, Types of system boards, The CPU & the chipset – CPU form factor, CPU slots and sockets, Different types of RAM, Buses – ISA, MCA, EISA, USB, Firewire, AGP, PCI, Setting the CPU & Bus speeds, CMOS setup and data protection.	01-08
Unit-02	09-14
<b>Managing Storage devices:</b> Know about Semiconductor Memories – RAM, ROM on System Board, Main Memory – SIMMs, DIMMs, Other RAM Technologies, Hard drives – hard drive technology – IDE, EIDE, SCSI, SATA, Hard drive partitions, Trouble-shooting hard drives & data recovery, Optimizing Hard drive – disk clean-up, disk fragmentation. Disk backup.	09-14
Unit-03	15-20
<b>Troubleshooting Fundamentals: -</b> Troubleshooting tools – Bootable rescue disk, diagnostic software, virus detection software, Anti-Static tools, Trouble-shooting guidelines – Power system, system board, OS & hard drive, Optical drives, keyboard, Monitor and printer problems, Surge protection & battery backup, Stand by UPS, Inline UPS, Line-interactive UPS, and intelligent UPS.	15-20
Unit-04	21-32
<b>Introduction to Networks and LAN components.: -</b> Understand the Overview of Networking, State the Need for Networking, Classification of Networks – LAN, MAN, WAN, List the Hardware and Software Components, Various Network Communication Standards, OSI Reference Model, TCP/IP Reference Model, Know about LAN Cables and Connectors, wireless network adapter, Know about Coaxial Cables, Twisted-Pair Cables, Optical Fiber Cables, and Connectors, Explain LAN Devices, Repeaters, Hubs, Switches, Network Interface Cards (NICs), Routers, Modem, Overview of Network Topologies.	21-32
Unit-05	33-43
<b>Network Addressing and Management:-</b> Introduction to Network Addressing, Components of IP Address, IP Address Classes, IP Subnetting, Classify the two types of Internet Protocol addressing IPv4 and IPv6 and state the need for IPv6, explain classful addressing and classless addressing in IPv4, State the need for protocols in computer networks, Hyper Text Transfer Protocol (HTTP), File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP), Telnet.	33-43

<b>Designation</b>	<b>Name</b>	<b>Signature</b>
Course Coordinator	Prof. Jitendra Gupta	
HoD	Prof. Jitendra Gupta	
Principal	Dr. Anil Kumar Singh	
Date		

