1 Year Advanced Diploma in Hardware, Networking & Information Security (ADHNS)

National Institute of Electronics and Information Technology (NIELIT), Gorakhpur
An Autonomous Scientific Institution of
Ministry of Electronics & Information Technology (MeitY), Govt. of India
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- Persistent questioning and healthy inquisitiveness are the first requisite for acquiring learning of any kind.
- True education must correspond to the surrounding circumstances or it is not a healthy growth.

Mahatma Gandhi

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About the Course

The Advanced Diploma Course in Hardware , Networking and Information Security (ADHNS) Programme has been designed to bridge the gap in the awareness and competency required by various categories of people as the users of Internet and various IT enabled services about deeper aspects of Information Security, responsible use and management of IT services.

The skill component is aligned with National Occupational Standards (NOS) as per National Skill Qualification Framework (NSQF), a competency-based framework that organizes qualifications according to a series of levels of knowledge, skills and aptitude

The course has been designed to fulfill Networking, Information Security Expert requirements of Industries. The contents of the course include operating system and diagnostic utilities, Maintenance and Networking with Windows Server 2012, Windows 8, CentOS Linux, Routing, Switching, Cloud Computing, Wireless Network, System & network security etc.

This course is Job Oriented course and designed to produce Networking/Security professionals capable of implementing, administering, maintaining Networks and overall Security Systems. It is an advanced level program that measures the ability to administer any networking problems and overall security system. This program has been designed to keep in mind that in now day's scenario for fresh 10+2 as well as graduate students from any stream.
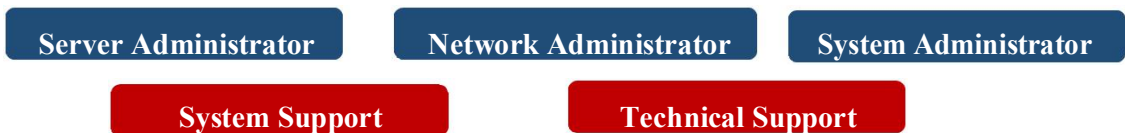
About NSQF

The National Skills Qualification Framework (NSQF) developed by the Ministry of Human Resource Development (MHRD), Government of India is a descriptive framework that provides a common reference for linking various qualifications. It is used for setting common principles and guidelines for a nationally recognized qualification system covering Schools, Vocational Education and Training Institutions, Technical Education Institutions, and Universities / Colleges.

The NSQF organizes qualifications according to a series of levels of knowledge and skills. These levels are defined in terms of learning outcomes i.e., the competencies (knowledge, skills and attitude) which the learners must possess regardless of whether they were acquired through formal, non-formal or informal education and training system. Qualifications are made up of occupational standards for specific areas of learning units or unit of competency. Units of competency are the specification of knowledge and skill and the application of that knowledge and skill to the standard of performance expected in the workplace.

The Unit of competency or National Occupation Standards comprising generic and technical competencies an employee should possess are laid down by the Sector Skill Council of the respective economic or social sector. The competency based curriculum is broken down into coherent parts known as Units. Each unit is further broken down into knowledge and skills on the basis of which evidence is to be provided by the learner and the evaluation is to be done by the teacher or trainer.

Job Role

Server Administrator	Network Administrator	System Administrator

System Support	Technical Support

Outcome of the Course

This skill-oriented course provides candidates with information required for configure and administration of OS Server, Networks, Router ,L2/L3 Switch, Cloud Computing , Wireless & its Security and equip them with the skills required to protect & recover the computer systems & networks from various security threats .

About NIELIT

NIELIT (National Institute of Electronics And Information Technology) is an autonomous scientific society of the Department of Electronics & Information Technology, Ministry of Communications & Information Technology, Government of India with Head Quarters at New Delhi. It is envisioned to bring the most updated global industry relevant computer education, within the reach of more and more in the areas of Information, Electronics and Communication Technology (IECT). NIELIT is implementing a joint scheme of All India Council for Technical Education(AICTE) and Department of Electronics & Information Technology [formerly Department of Information Technology (DIT)], Government of India.

NIELIT was formed on the 9th November 1994 and is registered under the Societies Registration Act, 1860. The management and administration of the NIELIT is overseen by Governing Council, under the chairmanship of the Minister of State, Communications & Information Technology, Government of India. Members of the Council consist of eminent academia from IITs, Universities, etc. and professionals from the industry

It was set up to carry out Human Resource Development and related activities in the area of Information, Electronics and Communication Technology (IECT).

At present, NIELIT has thirty one (31) offices located at Agartala, Aizawl, Ajmer, Aurangabad, Calicut, Chandigarh, Chennai, Chuchuyimlang, Churachandpur, Delhi, Gangtok, Gorakhpur, Guwahati, Imphal, Itanagar, Jammu, Jorhat, Kohima, Kolkata, Kokrajhar, Leh, Lucknow, Lunglei, Patna, Ranchi, Senapati, Shillong, Shimla, Silchar, Srinagar, Tezpur with its Headquarters at New Delhi. It is also well networked throughout India with the presence of about 800 institutes.

Over the last two decades, NIELIT has acquired very good expertise in IT training, through its wide repertoire of causes, ranging from 'O' Level (Foundation), 'A' Level (Advance Diploma), 'B' Level (MCA equivalent), 'C' Level (M-Tech level), IT literacy courses such as CCC (Course on Computer Concept), BCC (Basic Computer Course) and other such long term and short term course in the non-formal sector like courses on Information Security, ITeS-BPO(Customer Care/Banking), Computer Hardware Maintenance (CHM-O/A level), Bio-Informatics(BI-O/A/B level), ESDM etc, besides, high end courses offered by NIELIT Centres at Post-Graduate level (M.Tech) in Electronics Design & Technology, Embedded Systems etc. which are not normally offered by Universities/Institutions in the formal sector, in association with the respective state Universities.

Mission and Vision of NIELIT

Standardizing Non-Formal Education in India
Generating Quality Manpower in IECT.
Ensure a System of Accreditation of Courses & their Monitoring
Develop and Implement New Schemes of Courses
Undertake Development Projects & Provide Services in IT & related areas.
Establish a Quality System for Examination, Evaluation Certification at the National and International Level.
To be the leader in the development of industry oriented quality education and training and be the country's premier institution for examination and certification in the field of Information, Electronics and Communication Technology (IECT).

About NIELIT Gorakhpur

NIELIT, Gorakhpur is a unit of NIELIT which is an autonomous scientific institution of Department of Electronics & Information Technology (Deity), Ministry of Communications & information Technology, Govt. of India. NIELIT, Gorakhpur (Formerly DOEACC, Gorakhpur) was established as "Center for Electronics Design & Technology of India", (CEDTI) in June, 1989 .

The institution is a Premier Organization for Education, Training, R&D and Consultancy in IT and Electronics. The Centre offers courses in areas like Embedded Systems, VLSI, Instrumentation, Bio Informatics, ITES-BPO, Information Security, Cyber Law, Networking and other areas of Information Technology.

NIELIT Gorakhpur has been granted affiliation for the conduct of M.Tech.[Electronics Design and Technology],by Uttar Pradesh Technical University, Lucknow. It is also an accredited institution for 'O' and 'A' level Software Courses ,'O' and 'A' level in Bio-Informatics and for 'O' and 'A' level Hardware Courses.

Instructional System

The methodology of instruction in NIELIT Gorakhpur is different from that in the conventional colleges. The instructional system at NIELIT Gorakhpur is more learner-oriented, and the student has to be an active participant in the teaching-learning process.

The NIELIT Gorakhpur follows a multi-channel approach for instruction. It comprises a suitable mix of:
Quiz
Assignments
Scenario based Practical for getting real onsite Experience
Web based Lab Environment

Hostel Facilities

Hostel facility is available in NIELIT, Gorakhpur Campus .Currently this facility is available for boys only on chargeable basis. Students are required to pay the hostel fees for the duration of the course for which they are seeking admission at the time of joining the course.

- *For all the courses having semester structure [6-months course / 1-year course]:*
  a) *Rs. 5600/- for first semester. (It includes, Rs. 800/- as refundable Caution money)*
  b) *Rs. 4800/- for subsequent semester.*

- *For short term courses [1, 2 or 3 months]:*
  a) *Rs. 800/- per month.*

The Hostel has common rooms where hostlers can read daily newspapers and magazines, and play indoor games like carom board, chess etc. Television with cable and audio facilities are also provided. The Hostel has a small gymnasium badminton court, volley ball court etc.

The mess is run and managed by students and hostel committee. Food and menu are designed on student's interest. The quality of food is regularly checked by a mess committee and regular visit of concerned authority.

Course enquiries

Students can enquire about this course either on telephone or by personal contact between 9.00 A.M. to 5.30 P.M. (Lunch time 1.00 PM -1:30:00 PM) Monday to Friday.
E-mail: abhinav@nielit.gov.in / yousuf@nielit.gov.in
Website: http://nielit.gov.in/gorakhpur/

अ यथीर् इस कोसर्केबारेम सबहु 9.00 बजेसेसायंके5.30 (भोजनावकाश 1.00 PM- 1: 30 PM) केबीच म,   सोमवार सेशक्रवारु तक   यित्क्तगत संपकर्अथवा दरभाषू सख्यां

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प्रा कर सकतेहै|

Important Dates

Release of Advertisement	*June 2019*
Closing of Admission	*17 July 2019*
Commencement of Classes (Ist Semester)	*18 July 2019*

Admission Procedure

After release of advertisement, the interested students may visit the Institute along with the following
1. Original and attested Copies of Qualifications pertaining to Xth and XIIth , etc
2. Three passport size photograph and one stamp size photograph for identity card.
3. SC/ST Certificate (Original & not older than 6 Months, Self-attested copies, if applicable)
4. Income Certificate (Original & not older than 6 Months and attested copy, if applicable)
The students on reaching the Institute are required to meet the Front Office Councilor (FOC).He/she may collect admission form alongwith Course Brochure.. The FOC then directs the student to the Course Coordinator. The student gets the certificates and enrollment form verified by the Course Coordinator and then meets the FOC who shall direct the student to the Account Section for payment of fees. A student is thus admitted, attested copies of all documents shall be handed over to the Course Coordinator.

Discontinuing the course

No fees (including the caution deposit) under any circumstances, shall be refunded in the event of a student discontinuing the course. No certificate shall be issued for the classes attended.

A student can however, be eligible for module certificates (applicable only for courses which provide for modular admission) which he has successfully completed provided, he/she has paid the entire course fees. This is not applicable to SC/ST candidates availing fee concession. SC/ST candidates availing fee concession are eligible for module certificates only after completing the full course with required attendance .

Attendance and Discipline Rules

- *As per the norms of NIELIT Gorakhpur, a student should secure a minimum of 75% attendance of the total number of classes held during the semester in the aggregate of all the courses taken together and 75% in each individual theory/ lab course in a semester, failing which he/she will be debarred from appearing in the examinations.*
- *A student who has been detained due to shortage of attendance will not be promoted to the next semester and he/she will be required to take re-admission and repeat all courses of the said semester with the next batch of students in case he/she would like to continue. In other words he/she will lose one year.*
- *If a student is continuously absent for a period of one week or more without permission, his/her parents will be informed accordingly.*
- *Students are also advised to maintain utmost expected discipline in and outside the Campus. Disturbance of tranquility of the Campus in particular and society in general, through any means shall be treated as an act of indiscipline and suitable disciplinary action shall be taken against the defaulting students*
- *All the students are expected to be formally and decently dressed while in the institute and should be punctual, regular in attending classes and disciplined throughout their study.*
- *As per orders of the Hon'ble Supreme Court, Ragging is a Grievous Offence. Any one indulging in ragging will be severely punished. The punishment may take the form of expulsion from the Institution, suspension from the Institute or classes for a limited period or fine with a public apology. The punishment may also take the shape of*
  - *Reporting to the police and lodging an FIR*
  - *Withholding results*
  - *Suspension or Expulsion from hostel or mess, and the like*
  - *Suspension or Expulsion from Institute*

All cases of ragging will be referred to Anti Ragging Committee of the NIELIT Gorakhpur.

Activities at NIELIT Gorakhpur

This Centre is a Premier Organization for Education, Training, R&D and Consultancy in IT and Electronics.
The Centre offers courses in areas like Embedded Systems, Solar System Design, VLSI, Instrumentation, Bio-Informatics, ITES-BPO, Information Security, Cyber Law, Networking and other areas of Information Technology.
It caters to Training & Education needs of Diploma/ Graduate/ Master Level Students and corporate training programmes for small-scale industries and allied sectors in U.P.

The Centre imparts training through Long-Term formal courses in M.Tech (Electronics Design & Technology) and Non-formal courses in Hardware, Networking, Multimedia & Security, and Advanced Courses in Software Development on .Net Technologies, Java, J2EE and Linux Programming etc.

The Centre imparts training through NIELIT 'O' & 'A' Level in IT, Bio-Informatics, Multimedia and Hardware courses in non-formal sector.

Short-Term employment generating/vocational training programs in specialized areas of IECT such as Information Security, Hardware, Multimedia and Animation, VLSI Design and Embedded Systems etc.

Apart from training and education activities, NIELIT Gorakhpur has also carried out several R&D Project in the area of information security. One of them is "A Test Bed for Information Security Skill Development with Virtual Training Environment (VTE)", which is using the power of Virtualization.

The R&D team of VTE Project developed the unique product of Online Virtual Training Environment for Information Security Skill Development, which caters to all feasible and possible known facts of Information endangering across any type of computer system across the world.

After successful delivery of VTE objective, NIELIT Gorakhpur is now working on new R&D project to build "Advanced Virtual Environment based Interactive Information Security Training Kit for Advanced Level Information Security Skill Development".

Institute is conducting Online Examination and Certification programme of CCC & BCC for U.P state, as well as in house training programme for CCC.

The Centre offers courses in areas like Embedded Systems, Solar System Design, VLSI, Instrumentation, Bio-Informatics, ITES-BPO, Information Security, Cloud Computing, Networking and other areas of Information Technology.

Courses being offered by NIELIT Gorakhpur

Long Term Courses

M.Tech (Electronics Design & Technology)
M.Tech (VLSI & Embedded System)
NIELIT O/A Level Courses in IT (Information Technology)
NIELIT O/A Level Courses in CHM (Computer Hardware & Maintenance)
NIELIT O/A Level Courses in MAT (Multimedia & Animation Technology)
NIELIT O/A Level Courses in BI (Bio Informatics)
Certification Scheme in Information Security (CSIS)
        Level – 1:Certified System Security Analyst [CSSA]
        Level – 2: Certified System Security Professional [CSSP]
        Level – 3 : Certified Information Systems Security Auditor [CISSA]
           : Certified System Security Solution Designer [CSSSD]
           : Certified Computer Forensic Professional [CCFP]
One Year Advanced Diploma in Hardware ,Networking & Information Security (ADHNS)
One Year Advanced Diploma in Cyber Law and Security (ADCLS)
One Year Advanced Diploma in Software Development (ADSD)
One Year Post Diploma in Electronics Product Design.

One Year Post Diploma in Embedded System Design.
One Year Post Diploma in VLSI Design

Short Term Courses

Linux System Administration using Ubuntu/CentOS
Information Security Using Virtual Training Environment (VTE)
Enterprise Networking - A Practical Approach to learn System & Network Administration
Data Communication & Network Technologies (Routing and Switching)
Web Development with PHP using My SQL
Programming in .NET Technology
ORACLE 11g Administration (SQL/PLSQL)
Programming through C & C++
Programming in Advance Java
GIS and Remote Sensing
PC Repair & Maintenance (J2EE)
Cloud Computing
Windows System Administration
VHDL Programming
Embedded System Design
Microprocessor Based System Design
Digital System Design
Mat lab Programming
VLSI Design
Auto CAD
CCC & BCC Courses

Infrastructure Available at NIELIT Gorakhpur

Located in M. M. M. University of Technology Campus, Gorakhpur.
Spread over 28 acres of land.
The building has approx. 3450 sq.mt. covered area.
The institute has 14 labs, a conference room, a multipurpose building and Hostel Building.
The NIELIT, Gorakhpur Centre started using computers from its very inception in 1994 in its academic activities as well as in the administration. Over the years this centre has grown substantially in terms of departments and academic programmes as well as in infrastructure.
Currently the centers equipped with more than 300 Desktop PCs , 40 Laptops and 10 Servers.
The centre has implemented a campus Wide Local Area Network (LAN) with optical fiber backbone connecting the academic, administrative departments as well as hostel building spread over the campus.
Internet connectivity is being provided through 100 Mbps NKN BSNL Leased line. Wireless LAN/Wi-Fi also been set-up to extend the LAN connectivity to the administrative, laboratory and Hostel section.
All lab are interconnected with OFC backbone for getting Gigabit advantage.
The institute has full access to IEEE Journals & research papers through MCIT Consortium.

ƒ **Hardware**
1) Cisco 2821,2851 Router
2) DAX L3 & L2 Gigabit Switches
3) Cisco ASA 5510 Firewall with IPS
4) Cisco 3560 catalyst switches
5) HP IP SAN MSI 2012 Storage,
6) HP DL 380 Server,
7) HP DL 580 G7 Server
8) EMC2 NAS
9) Power Backup of 160 & 80 KVA

ƒ **Communication System**
1) Web Conferencing
2) Smart Classroom
3) Virtual Classroom

ƒ**Laboratory**
1) Power Electronics Lab
2) IT Lab
3) Instrumentation Lab
4) IT Security Lab
5) Microprocessor Lab
6) Advanced IT Lab
7) Computer Lab
8) Multimedia Lab
9) EDA Tools Lab
10) Communication Lab

11) Project Lab   13) Power Electronics Lab
12) Bio-Informatics Lab   14) Analog & Digital Lab

Outline of Two Semester Advanced Diploma in Hardware Networking and Information Security (ADHNS)

Qualification Title

Advance Diploma in Hardware ,Networking and Information Security

Qualification Code

NIELIT/IS/1/15

Eligibility

10+2/10+ITI / Graduate

Course Fee

Students admitted to this course shall pay the fees (In ₹) as per the table given below:

For General & OBC Candidate only	
Course Fee + GST	35400.00
Examination Fees + GST	4248.00(Theory Paper, Practical Paper, Project & Major Project)
Total Fee	39,648.00/=
Library Fee* (Refundable)	1000.00

*Optional

SC/ST Candidates

Registration Fees/Tuition Fees/Examination fees are waived for SC/ST students admitted under SCST/TSP. However they are required to remit an amount of Rs.1000/- as Advance caution/Security deposit. This amount will be considered as caution/security deposit and will be refunded after successful completion of the course.
If the student fails to complete the course successfully this amount along with any other caution/security deposits by the student will be forfeited.

For SC/ST Candidate only	
Course Fee	NIL
GST	NIL
Examination Fees	NIL
Library Fee* (Refundable)	1000.00
Caution Money (Refundable)	1000.00

*Optional

Duration

1220 hours.
Course Timings : 10:00 A.M to 5:00 PM [Monday – Friday]

Level of the qualification in the NSQF

5

Body/bodies which will assess candidates	Examination Cell, National Institute of Electronics and Information Technology, 6-CGO Complex, Electronics Niketan, Lodhi Road, New Delhi. 110003.		
Body/bodies, which will award the certificate for the qualification.	Certification Division, National Institute of Electronics and Information Technology 6-CGO Complex, Electronics Niketan, Lodhi Road, New Delhi. 110003.		
Body, which will accredit providers to offer the qualification.	Accreditation Division, National Institute of Electronics and Information Technology 6-CGO Complex, Electronics Niketan, Lodhi Road, New Delhi. 110003.		

S.No	Title of unit or other component	Unit Code	Mandatory/ Optional	Estimated size (Hours)	Level
1	PC & PERIPHERAL ARCHITECTURE	ADHNS-I	Mandatory	120	
2	OPERATING SYSTEM & DIAGNOSTIC UTILITIES	ADHNS-II	Mandatory	120	
3	BASIC NETWORK	ADHNS-III	Mandatory	120	
4	NETWORKING THROUGH WINDOWS-2012	ADHNS-IV	Mandatory	120	
5	PROGRAMMING TOOLS AND TECHNIQUES	ADHNS-V	Mandatory	120	
6	NETWORKING THROUGH LINUX	ADHNS-VI	Mandatory	120	
7	CLOUD COMPUTING	ADHNS-VII	Mandatory	120	5
8	ADVANCE NETWORKING	ADHNS-VIII	Mandatory	120	
9	WIRELESS NETWORK	ADHNS-IX	Mandatory	120	
10	INFORMATION SECURITY	ADHNS-X	Mandatory	120	
11	ENHANCING COMMUNICATION & SOFT SKILL	ADHNS-XI	Mandatory	20	

Marking Scheme

S.No	Title of unit or other component	Unit Code	Theory	Practical	Viva-Voce	Total
1	PC & PERIPHERAL ARCHITECTURE	ADHNS-I	100	75	25	200
2	OPERATING SYSTEM &	ADHNS-II	100	75	25	200
3	BASIC NETWORK	ADHNS-III	100	75	25	200
4	NETWORKING THROUGH	ADHNS-IV	100	75	25	200
5	PROGRAMMING TOOLS AND	ADHNS-V	100	75	25	200
6	NETWORKING THROUGH LINUX	ADHNS-VI	100	75	25	200
7	CLOUD COMPUTING	ADHNS-VII	100	75	25	200
8	ADVANCE NETWORKING	ADHNS-VIII	100	75	25	200
9	WIRELESS NETWORK	ADHNS-IX	100	75	25	200
10	INFORMATION SECURITY	ADHNS-X	100	75	25	200
11	ENHANCING COMMUNICATION &	ADHNS-XI	50	-	-	50
	GRAND TOTAL		1050	750	250	2050

Detailed Curriculum

PC & PERIPHERAL ARCHITECTURE (ADHNS-I)

Name of Unit of Qualification : PC & PERIPHERAL ARCHITECTURE (ADHNS-I)

Duration : 120 Hours

Topics : PC & PERIPHERAL ARCHITECTURE

Performance Criteria (OUTCOME) No.	Contents	Hrs.
Introduction to a Computer	• The basic building blocks of a computer system- the CPU , the Arithmetic & Logical Unit . The binary numbers as a language which computer understands, interprets and processes. The Input & Output devices as means of communication with the Computer system. • NUMBER SYSTEM: Decimal odometer, Binary odometer, Why Binary numbers are used, Binary, Decimal and Hexadecimal number system; Conversion from decimal and hexadecimal to Binary and vice versa, BCD numbers, ASCII code, Basic Concept of parity. • The concept of hardware & the software - the two main components of a computer system. The data & the information. The importance of information flow & its impact on growth & productivity. • Study of PC-AT/ATX System, Pentium, Core, Core 2 Cord, Core 2 Duo, I3, I5, I7 Processor Basics of Processor and CPU Block Diagram of Computer and Computer Generation Motherboards, Chipset and Controllers, BIOS and the Boot Process, Computer Memory. • IDE and SATA Devices: Hard Disk Drive and CD/DVDs Drives, SCSI Devices, Floppy Disk, Zip Drive, Backup Drive, Expansion Cards- LAN Card, IDE Card , VGA and SVGA Cards, Sound Card, Interface Cards, I/O cards, Video Cards, USB Card, Fire-Wire Cards, Internal Ports, Cables and Connector Types. • Hands on Lab	25
Basic Electronics and Components	• Introduction, Current, Voltage, emf, Power generation system, Switch-plug wiring, Analyzing Conductivity of elements, Types of Conductors, Semi conducers - Silicon, Germanium. • Electronic Components: Resistors, Capacitors, Inductors, Transformers, Types, working and Properties, Voltage and current sources , Diode, Zener diode, Photo diode, Light emitting diode(LED), Transistors (NPN,PNP), their characteristics and uses, Field effect transistor, Photo transistor. • Passive & active components. Resistance & Capacitance & Inductance. • Connectors, Relays, Switches and Panel Components: Introduction to relays, their characteristics classifications, and performance during pick up and drop out, introduction to connectors and switches, different types and their applications, panel components	25
Introduction to Diodes and Transistors	• Introduction to Diodes, their characteristics and applications, Zanier diodes and their characteristics and impedance, introduction to Bipolar transistors and their applications, functions, specification, testing of Diodes and Transistors. • Introduction to operational amplifiers (OP Amps) and simple circuits • Hands on Lab	20
Measuring Instruments	• Basics of Digital Multimeters, Cathode Ray Oscilloscope, Soldering & Desoldering Techniques • Hands on Lab	10
Digital and Integrated Circuits	• Introduction to logic levels & gates, Definition symbols and truth tables of NOT.AND, OR, NAND, NOR, EXOR Gates Latches, unidirectional & bi-	20

	directional buffers, tristate devices, Clock generators, Flip-flops, Registers, Counters, Multiplexers & Demutiplexers. • Introduction to various logic families and their characteristic, Bipolar Logic Family, Unipolar Logic Families. Latest trends in packaging. • Semiconductor Memories: Hierarchy of memories used in a computer, Classification of memories and trends in PC memory modules. • Hands on Lab	
Power Supplies	• Constituents of Power Supplies • Introduction to half wave, full wave and bridge rectifier circuits, introduction to regulated power supplies (linear), power supply filters, three terminal regulators and regulated power supply using three terminal regulators. • Hands on Lab	10
Architecture of PC Peripherals	• Switch Mode Power Supply: Discrete components, principle of operation SMPS, converter topologies, PWM IC's and case study. • Monitors: Monitors:- CRT, LCD and LED Displays, CRT construction and working, 9 pin input type-monitor, block diagram of color monitor. • Hard Disk Drive: Its construction, basic principle of operation, disk drive types, installation, cables, connectors and jumper details, formatting and managing hard disk drive. Various interface standards. • Keyboard: Block diagram of keyboard circuit. • Printer: Types & components of printers, printer interface with computer, detailed circuit study of Dot Matrix Printer, function block diagram for various sub-assemblies of printer, principle of operation of Laser and Inkjet printers, various mechanical sub-assemblies, general maintenance aspects. • Hands on Lab	20

OPERATING SYSTEM & DIAGNOSTIC UTILITIES (ADHNS-II)

Name of Unit of Qualification	: OPERATING SYSTEM & DIAGNOSTIC UTILITIES (ADHNS-II)
Duration	: 120 Hours
Topics	: **OPERATING SYSTEM & DIAGNOSTIC UTILITIES**

Performance Criteria (OUTCOME) No.	Contents	Hrs.
BIOS, POST & DOS Batch Files	• Concept of BIOS, POST its error codes and their interpretation, • Operating System concepts, definition, Batch processing, Time Sharing, Real Time, Multi-tasking, Multi-Programming, Computer Networks, Distributed Processing • Steps in the booting process, AUTOEXEC.BAT and CONFIG.SYS files, Memory usage in the DOS environment, Basic DOS commands, internal and external commands Basic file commands, • Making and access directory from windows Console, operations performed on files. Using the FDISK, FORMAT, DEFRAG, SCANDISK, EMMAKER to optimize memory • Understanding .INI files in Windows • Detailed description of CMOS setup and meaning of its various setting CMOS password setting. • System files FAT and NTFS, Dos 6.22, Windows XP, Windows Vista, Windows 7 and Windows 8 and RedHat Linux and Multi Boot Operating System. • Device Installation Graphics Card, Sound Card, LAN Card, Wireless LAN Card, SCSI Card, External Drive, Flash Cards, Web Camera, CCTV Camera, Mobile Devices, Pen Drive, Firewire Cards, Modem, Plotter, Wireless LAN, Access Point etc • Hands on Lab	40
Discovering Windows 7/ 8	• Discovering the new features, Installing Windows7 and 8 ,Navigating the system, Evaluating alternate installation options, Discovering the features, navigating the system Evaluating alternate installation options, Ensuring optimal configurations, troubleshooting and restoring, creating and modifying security boundaries, operating within an active directory domain. • Configuring and controlling user environments, customizing user account control, implementing discretionary access control (DAC), securing and auditing the system, Encrypting drives and devices. • Configuring TCP/IP functionality, network location awareness, connecting to wireless networks, sharing and accessing resources, accessing the enterprise remotely, Leveraging built in technologies, monitoring and analyzing applications, ensuring application compatibility. • Hands on Lab	30
Back-Up Procedure & Disaster Prevention	• Write protection of your software MS-DOS delete protection, crash recovery, preventing hard disk failures • Back-up & Restore procedures, types of back-up, media for back-up, RAID systems. Preparation of Bootable CD. • Hands on Lab	20
General Troubleshooting And Maintenance	• Diagnostic Tools & PC Maintenance • Introduction, Virus and its types, Effect of Virus for Computer System, Scanning and Antivirus remover tools, Antivirus Utilities for Diagnostic	30

	• Safety and Preventive Maintenance Tools, Data Recovery, Concept of Fax and E-mail, PC care and Maintenance, Electrical Power Issues. • Troubleshooting PC Hardware:- O/S Troubleshooting issues in computer System • Assembly and disassembly of PC and its various parts, startup problems, run problems their identification and remedy, problem of keyboard, displays, printers, FDD's HDD's, CDD's, SMPS motherboard, their identification and remedy. Servicing and Trouble shooting of Mouse and Keyboard, Maintenance of UPS. • Hands on Lab	

BASIC NETWORK(ADHNS-III)

Name of Unit of Qualification : BASIC NETWORK(ADHNS-III)
Duration : 120 Hours
Topics : BASIC NETWORK

Performance Criteria (OUTCOME) No.	Contents	Hrs.
Introduction to Networks	• Introduction to Computer Networks, Element of Networks, Types of Networks, Network Topologies: Bus, Star, Mesh, Ring etc • Hands on Lab	10
Media and Connectors	• Common LAN Media: STP, UTP, Coaxial cable, Optical fiber, TIA/EIA standards • Making & testing Cable, Straight thru Cable, Crossover Cable , Connectors, Jacks, Patch Panels • Hands on Lab	15
Networking Devices	• NIC, Repeaters, Hub and its types, Bridges and their types, Switches, Routers • Hands on Lab	10
Network Model	• Description of the seven layers of OSI Model, TCP/IP Model, Comparison of OSI & TCP/IP Model. • Hands on Lab	10
Physical and Data Link Layer	• MAC Sub-layer, LLC, MAC Addressing, Framing, Error control, Flow control, Token Ring, Ethernet, FDDI, Address Resolution Protocols • Hands on Lab	10
Network and Transport Layer	• Role of Network layer, Virtual Circuits, Datagram, Packet, Types of Routing, Routing Algorithms and Protocols, ICMP, Introduction to Transport layer, TCP and UDP Protocols and Comparison .Network Layer, IP address, IP address Classes, Basics of Sub-netting, Subnet Masking • Hands on Lab	20
Presentation and Session Layer	• Session layer function, Token Management and Session Layer Protocols, Presentation layer function and Protocols • Hands on Lab	10
Application Layer	• Introduction to Application Layer Protocols and their role. The Domain name system, Electronics Mail, the World Wide Web, FTP, Telnet, HTTP, DHCP • Hands on Lab	15
Internet and its Service Providers	• ISP , WEB HOSTING & REGISTRAR • Internet, connection types, ISP, ISP study • Web hosting, Top Web Hosting Companies in India performing whois to get IP by name, Name by IP & IP address owner information • IANA, IANA Root Zone Database, IANA Number Resources • Local Internet registry (LIR),National Internet Registry (NIR), AfriNIC, APNIC, ARIN, LACNIC, RIPE NCC, Regional Internet Registry (RIR). • Registration of a domain, Top Domain Registrars, Registrar for .EDU.IN, .RES.IN, .AC.IN, .GOV.IN in INDIA • Hands on Lab	20

Name of Unit of Qualification	**: NETWORKING THROUGH WINDOWS 2012 (ADHNS-IV)**	
Duration	**: 120 Hours**	
Topics	**: NETWORKING THROUGH WINDOWS 2012**	

Performance Criteria (OUTCOME) No.	Contents	Hrs.
Introduction to Windows 2012 Serve	• Windows 2012 server, Windows 2012 server family, Standard Edition ,Datacenter Edition, Foundation Edition ,Essentials Edition, • Plan for a server installation; Installation Requirements ,64-Bit Support, Installing the Operating System, Performing a Clean Installation, Performing an Upgrade Installation plan for server roles; plan for a server upgrade; install Server Core; Configure Server Core • Hands on Lab	10
Managing File System and Security Resources	• Working with file systems, FAT, FAT32 NTFS. File conversion, Configure Distributed File System (DFS), Configure File Server Resource Manager (FSRM),Install the FSRM role • configure quotas; configure file screens; configure reports, Configure file and disk encryption, Configure Bitlocker encryption; configure the Network Unlock feature; configure Bitlocker policies; configure the EFS recovery agent; manage EFS and Bitlocker certificates including backup and restore • Hands on Lab	10
Accessing Files and Folders: Managing file and folder attributes	• Managing shared folder permissions. How user and group Permissions combine? • Configuring and managing the distributed file system. Creating and configuring a Dfs Root/Dfs links, their types, replicas. Configuring client computers to user Dfs. • Managing NTFS file and folder security, NTFS permissions,. How user and group NTFS permissions combine? • Taking ownership of files and folders. Configuring and monitoring disk quotas. Troubleshooting, • Understanding disks and volumes. Types of disks/partitions/volumes. Using disk management. Creating and formatting partitions. Upgrading a disk. Creating a simple volume/spanned, volume/striped, volume/mirrored, volume/RAID-5. Logical drives, recovering disks and volumes • Hands on Lab	10
Users and Groups	• Creating, configuring, managing and troubleshooting User Accounts. Managing user profiles, account policies, user rights, authentication, creating and managing group accounts, groups on the local computer. • Groups in Active Directory. System policy and group policy their types, management, order of application and troubleshooting • Hands on Lab	10
Configuring network services and access	• Configure IPv4 and IPv6 addressing, Configure IP address options; configure Subnetting; configure interoperability between IPv4 and IPv6; configure ISATAP; configure Teredo • Dynamic Host Configuration Protocol (DHCP) service, Create and configure scopes; configure a DHCP reservation; configure DHCP options; configure client and server for PXE boot; configure DHCP relay agent; authorize DHCP server. • Configure DNS zones: Configure primary and secondary zones; DNS zone types Zone delegation ,Split DNS, Forwarders and conditional	10

	forwarders ,Stub zones configure stub zones; configure conditional forwards; configure zone and conditional forward storage in Active Directory; configure zone delegation; configure zone transfer settings; configure notify settings: Configure DNS records: Create and configure DNS Resource Records (RR) including A, AAAA, PTR, SOA, NS, SRV, CNAME, and MX records; configure zone scavenging; configure record options including Time To Live (TTL) and weight; configure round robin; configure secure dynamic updates • Hands on Lab	
Configure VPN and routing	• Install and configure the Remote Access role; implement Network Address Translation (NAT). • configure VPN settings; configure remote dial-in settings for users; configure routing • Hands on Lab	10
Web Server Management with IIS	• Installing IIS 8,Adding the Web Server Role via Service Manager, Installing IIS 8 via PowerShell, Creating a Simple Website, Configuring Site Settings, • Hosting Multiple Websites ,Deploying Sites ,Installing and Configuring SMTP, Adding the SMTP Server, Feature, Setting Up an SMTP Server, Adding the SMTP E-mail Feature to an IIS 8 Website, Integrating FTP into IIS 8 Web Pages, The FTP File Transfer Publishing Service ,Adding FTP to an IIS 8 Website, Advanced Administration, • Using Web Management Services, Connecting, Securing, Logging, Backing Up and Restoring Data • Hands on Lab	10
Introduction to Active Directory	• What is Active Directory? Understanding the Features of Active Directory. Naming conventions logical structure of Active Directory. Domain, organizational units (OUs), trees and forests. Objects and classes, schema, global catalog server. Installing Active Directory Replication, sites, Flexible Single Master Operations (FSMO), Domain Name System (DNS). • Installing Active Directory, Configure and manage Active Directory, Configure service authentication, Create and configure Service Accounts; create and configure Group Managed Service Accounts; create and configure Managed Service Accounts; configure Kerberos delegation; manage Service Principal Names (SPNs) • Configure Domain Controllers, Configure Universal Group Membership Caching (UGMC); transfer and seize operations masters; install and configure a read-only domain controller (RODC); configure Domain Controller cloning. • What does DNS have to do with Active Directory? DNS domain names and naming conventions. Installing DNS for Active Directory, creating and configuring DNS zones, configuring zone transfers. Removing Active Directory. Verifying and troubleshooting an Active Directory installation. Organizational Unit (OU), Creating OUs, configuring OU, properties. Managing Active Directory objects. Locating objects in Active Directory. Publishing resources in Active Directory. Moving objects in Active Directory. Controlling Access to Active Directory Objects. Delegating administration of Active Directory objects • Maintain Active Directory, Back up Active Directory and SYSVOL; manage Active Directory offline; optimize an Active Directory database; clean up metadata; configure Active Directory snapshots; perform object- and container-level recovery; perform Active Directory restore • Hands on Lab	20
Configure domain account policies	• Configure domain user password policy; configure and apply Password Settings Objects (PSOs); delegate password settings management; configure local user password policy; configure account lockout settings • Hands on Lab	5

Configure and manage Group Policy	• Configure Group Policy processing, Configure processing order and precedence; configure blocking of inheritance; configure enforced policies; configure security filtering and WMI filtering; • Configure Group Policy settings, Configure settings including software installation, folder redirection, scripts, and administrative template settings; import security templates; import custom administrative template file • Manage Group Policy objects (GPOs), Back up, import, copy, and restore GPOs; create and configure Migration Table; reset default GPOs; delegate Group Policy management • Hands on Lab	10
Auditing and Security	• Managing, auditing. Enabling and configuring system access, auditing enabling and configuring Object access. Auditing, monitoring and analysing security events, using security templates, troubleshooting. • Hands on Lab	5
Deploy, manage, and maintain servers	• Deploy and manage server images: Install the Windows Deployment Services (WDS) role; configure and manage boot, install, and discover images; update images with patches, hotfixes, and drivers; install features for offline images, Implement patch management: Install and configure the Windows Server Update Services (WSUS) role; configure group policies for updates; configure client-side targeting; configure WSUS synchronization; configure WSUS groups • Backup and Recovery: User data and system state, data backup types. Backup strategies, scheduling, recovering user data and system state, data recovering from a system failure. Using the recovery console to restore a system, using the emergency repair disk to restore a system • Hands on Lab	10

PROGRAMMING TOOLS AND TECHNIQUES (ADHNS-V)

Name of Unit of Qualification	: PROGRAMMING TOOLS AND TECHNIQUES (ADHNS-V)
Duration	: 120 Hours
Topics	: PROGRAMMING TOOLS AND TECHNIQUES

Performance Criteria (OUTCOME) No.	Contents	Hrs.
Introduction to C Language	• Algorithms, Flow charts. Computer Language: Classification. • Program Concept: Source program, Compiling, Program execution, Object program. Measures of program performance. C- Language Fundamentals: Tokens, Fundamental data types, Precedence of evaluation. • Flow of Control:- Branching: If statement, If – else and Else – If constructs, nested if statements, switch statements. Looping: for loops, while and do-while loops, nested loops, break and continue statements. • Hands on Lab	30
Introduction to HTML	• What is HTML , HTML Documents, Basic structure of an HTML document , Creating an HTML document , Mark up Tags, Heading-Paragraphs, Line Breaks, HTML Tags. Elements of HTML:- Introduction to elements of HTML, Working with Text, Working with Lists, Tables and Frames, Working with Hyperlinks, Images and Multimedia, Working with Forms and controls. • Hands on Lab	30
Introduction to JAVA Programming	• Introduction to Java :- History of Java, Installation of JDK, Data Types, Identifiers, variables & constants, first java program,Java Script:- Introduction to java Script • Introduction to Class & object:- Basic of Class & object, Object creation, Object Creation, Accessing Object • Hands on Lab	30
Introduction to PHP Programming	• Introduction on PHP:- Introducing PHP and MySQL, The PHP Story, History, Features, Architecture, Sample Applications. • Installation & Configuring the WAMP Server • Basic Programming:- Using Variables, Statements, and Operators • Hands on Lab	30

NETWORKING THROUGH LINUX(ADHNS-VI)

Name of Unit of Qualification : NETWORKING THROUGH LINUX(ADHNS-VI)
Duration : **120 Hours**
Topics : **NETWORKING THROUGH LINUX**

Performance Criteria (OUTCOME) No.	Contents	Hrs.
Introduction to CentOS Linux	• The CentOS Linux File system, The CentOS Shell, The CentOS Linux Utilities • Hands on Lab	10
Installing CentOS Server	• Preparing for the Installation, Starting the CentOS Server Installation Process, Configuring the Server's Hard Drive, Completing the Installation • Hands on Lab	10
Using the Command Line	• Working as root, working with the Shell, Using Bash to Best Effect, Managing Bash with Key Sequences, • Performing Basic File System Management Tasks, Working with Directories, Working with Files, Viewing the Content of Text Files, Finding Files That Contain Specific Text , Creating Empty Files, Piping and Redirection, Piping, Redirection, • Finding Files, Working with Vi Editor: Vi Modes, Saving and Quitting, Cut, Copy, and Paste, Deleting Text. Getting Help: Using man to Get Help, Getting Information on Installed Packages • Hands on Lab	10
System Administration	• Software Management, Software Repositories and Package Databases, Package Management Utilities, Using apt, Installing Software from Tarballs, Configuring a Graphical User Interface, Creating Backups, Making File Backups with tar, Making Device Backups Using dd, Configuring Logging, Configuring syslog • Hands on Lab	10
File System Management	• Mounting Disks, Using the mount Command, Unmounting Devices, Automating Mounts with /etc/fstab, Checking File System Integrity • Working with Links: Working with Symbolic Links, Working with Hard Links. • Configuring Storage, Comparing File Systems, Creating File Systems, Working with Logical Volumes • Hands on Lab	10
Configuring Server for Security	• Setting Up User Accounts, Commands for User Management, Managing Passwords, Modifying and Deleting User Accounts, Configuration Files, Creating Groups, Commands for Group Management, /etc/group, Using Group Passwords, Managing the User's Shell Environment • Configuring Permissions, Read, Write, and Execute: The Three Basic Linux Permissions, Permissions and the Concept of Ownership, Working with Advanced Linux Permissions, Setting Permissions, Using umask to Set Default Permissions for New Files • Working with Access Control Lists, Preparing the File System for ACLs, ACL Limitations, Applying File Attributes, Apply Quota to Allow a Maximum Amount of Files, Installing the Quota Software, Preparing the File System for Quota, Initializing Quota, Setting Quota for Users and Groups, Configuring Administrator Tasks with sudo • Hands on Lab	10
Personalizing the System	• Process Monitoring and Management, Different Kinds of Processes, Foreground and Background, Managing Processes, Other Tools to Monitor System Activity, Setting Process Priority, Executing Processes Automatically, Configuring cron, Executing Once with at, Tuning the Boot Procedure • Managing the GRUB Boot Loader, The GRUB Configuration File, Installing GRUB, Working with the GRUB Boot Menu, Run levels, • Hands on Lab	10

Configuring a Network Connection and Introduction to Cryptography	• Configuring the Network Card, Using ifup, ifdown, and Related Tools, Using ifconfig, Using the ip Tool, Configuring the DNS Resolver, Configuring Network Card Properties with the ethtool Command, Troubleshooting Network Connections, Testing Connectivity, Testing Availability of Services, Monitoring the Network Interface, Monitoring Network Traffic, Configuring Telnet & FTP, Connecting Remotely with SSH, Working with Public/Private Key Pairs, Working with Secure Shell, Configuring SSH, Using Key-Based Authentication, A Short Introduction to Cryptography, Using Public/Private Key–Based Authentication in an SSH Environment • Hands on Lab	10
Using CentOS Server as a File Server	• Sharing Files with NFS, Using the NFS Server, Understanding How the NFS Works, Configuring an NFS Server, Configuring an NFS Client, Monitoring the NFS Server • Sharing Files with Samba, Samba Server Possibilities and Impossibilities, Configuring the Samba Server, Client Access to the Samba Server • Hands on Lab	10
Configuring Network Infrastructure Services	• Configuring DNS, Methods of Name Resolution, Structure of the DNS Hierarchy, Introducing Forward and Reverse DNS, Configuring DNS, Configuring Reversed Lookup, Testing Your Name Server • Configuring DHCP, Understanding the DHCP Protocol, Creating the DHCP Server Configuration, The DHCP Process, The /etc/dhcp/dhcpd.conf Configuration File, Advanced DHCP Configuration Options • Configuring NTP, How NTP Works, Configuring a Stand-Alone NTP Time Server, Pulling or Pushing the Time, Configuring an NTP Client, Checking NTP Synchronization Status, Customizing Your NTP Server, Starting Services with xinetd, Setting up Xinetd, Setting Up Mail Servers, Clients • Hands on Lab	10
Setting up Web server & Squid Proxy Server and securing Web Services	• Setting up Apache, Apache Components, Starting, Stopping, and Testing the Apache Web Server, The Structure of the Apache Configuration Files, Checking the Configuration, Working with Virtual Hosts, Configuring Virtual Hosts, Managing Access to the Web Server, Configuring Host-Based Access Restrictions, Configuring User-Based Access Restrictions • Enabling HTTPS, Creating a Self-Signed Certificate, Configuring Apache to Use the Self-Signed Certificate • Hands on Lab • Configuring a Squid Proxy Server, Installing a Squid Proxy Cache, Configuring Squid Access Control Policies, Configuring User Authentication • Hands on Lab	10
Setting Up the Firewall with iptables	• Using iptables to create a Firewall • Hands on Lab	5
Setting Up the Mail Server	• SMTP, POP3,IMAP, Postfix, Round cube • Hands on Lab	5

CLOUD COMPUTING (ADHNS-VII)

Name of Unit of Qualification : CLOUD COMPUTING (ADHNS-VII)
Duration   : 120 Hours
Topics   : CLOUD COMPUTING

Performance Criteria (OUTCOME) No.	Contents	Hrs.
Introduction to Cloud Computing	• What is cloud? , Cloud Computing definition, private, public and hybrid cloud.Services provided by cloud are categorized :Software As a Service(SaaS) ,Infrastructure As a Service(IaaS) ,Platform As a Service(PaaS) ,Desktop As a Service (DaaS) VDI etc. How Cloud Computing Works, Advantages & Disadvantages, Applications for Businesses Cloud Service Providers, • Brief overview of major Cloud Service providers –Amazon AWS, Google App Engine, Microsoft, VMware. , How Companies are using Cloud Computing , Cloud Computing Risks and Issues • Hands on Lab	20
Virtualization	• Virtualization concepts, Objectives, Types of Virtualization & its benefits, Introduction to Various Virtualization OS, HA/DR using Virtualization • Moving VMs, SAN backend concepts, S/W defined Networking (OpenFlow/OpenVSwitch), S/W Defined Datacenter, S/W Defined Storages. • Virtualization for Enterprise using VMware,,Xen,KVM with oVirt, Hyper-V • Hands on Lab	20
Building Cloud Networks	• Designing and Implementing a Data Center-Based Cloud, Industry and International Standards Communication Requirements for Cloud Implementation • Hands on Lab	20
Private , Public & Hybrid Clouds	• What is Private, Public & Hybrid Clouds, and Advantages & Disadvantages? On Premises and Off Premises Cloud services, installing a Cloud service using Eucalyptus, Open Nebula ,Open Stack , Amazon Web Services ,Microsoft Azure ,Google App Engine ,VMware air • Hands on Lab	20
Setting up your own Cloud	• How to build private cloud using open source tools • Understanding various cloud plugins, Setting up your own cloud environment • Autoprovisioning, Custom images, integrating tools like Nagios, Integration of Public and Private Cloud • Hands on Lab	40

ADVANCE NETWORKING (ADHNS-VIII)

Name of Unit of Qualification	**: ADVANCE NETWORKING (ADHNS-VIII)**
Duration	**: 120 Hours**
Topics	**: ADVANCE NETWORKING**

Performance Criteria (OUTCOME) No.	Contents	Hrs.
Internetworking Basics	• Internetworking Basics, Broadcast domain, Collision Domain, Hub, Switch & Router ,Ethernet Cabling: - Straight-Through Cable, Crossover Cable, Roll over Cable • Internet Protocols: - TCP/IP Model, IP Addressing, IP Terminology, IP Addressing Scheme, Private IP Addresses ,TCP/IP Troubleshooting utilities, Troubleshooting IP Addressing • Hands on Lab	10
IP Subnetting and Variable Length Subnet Masks (VLSM)	• Subnetting Basics, How to Create Subnets, Subnet Masks, Classless Inter-Domain Routing (CIDR), Subnetting Class C Addresses, Subnetting Class B Addresses, Subnetting Class A Addresses • Variable Length Subnet Masks (VLSMs), VLSM Design, Implementing VLSM Network • Hands on Lab	10
Introduction to the Router User Interface and Command-Line Interface	• The Cisco Router User Interface, Cisco Router IOS, Connecting to a Cisco Router, Bringing up a Router, Setup Mode, Command-Line Interface, Logging into the Router, Overview of Router Modes, CLI Prompts • Basic commands • Hands on Lab	15
Routing Basics	• IP Routing, Routing Basics, Static Routing, Default Routing, Dynamic Routing, Routing Protocol Basics, Administrative Distances • Routing Protocols, Distance-Vector Routing Protocols, Maximum Hop Count, Route Poisoning • Routing Information Protocol (RIP), Interior Gateway Routing Protocol (IGRP) • Enhanced IGRP (EIGRP) and Open Shortest Path First (OSPF) EIGRP Features and Operation, Open Shortest Path First (OSPF) Basics • Hands on Lab	15
Switching Basics	• Layer 2 Switching basics, Configuring the Catalyst 1900 and 2950 Switches,1900 and 2950 Switch Startup, Setting the Passwords, Setting the Hostname, Setting IP Information, Configuring Interface Descriptions, Erasing the Switch Configuration • Hands on Lab	10
VLAN Basics	• Virtual LANs (VLANs) VLAN Basics, Broadcast Control, Security ,Flexibility and Scalability ,VLAN Memberships, Static VLANs ,Dynamic VLANs, Identifying VLANs, Frame Tagging, LAN Identification Methods , Inter-Switch Link (ISL) Protocol • VLAN Trunking Protocol (VTP),VTP Modes of Operation, VTP Pruning, Routing between VLANs ,Configuring VLANs, Assigning Switch Ports to VLANs ,Configuring Trunk Ports ,Configuring Inter- VLAN Routing, Configuring VTP. • Hands on Lab	15
Components of a Router	• Managing a Cisco Internetwork The Internal Components of a Cisco Router, The Router Boot Sequence Understanding the Configuration Register Bits, Checking the Current Configuration Register Value, Changing the Configuration Register, Recovering Passwords,	10

	• Backing Up and Restoring the Cisco IOS, Verifying Flash Memory, Backing Up the Cisco IOS, Restoring or Upgrading the Cisco Router IOS ,Backing Up and Restoring the Cisco Configuration, Erasing the Configuration • Hands on Lab	
Managing Traffic with Access Control Lists	• Managing Traffic with Access Lists Introduction to Access Lists, Standard Access Lists, Wildcard Masking, Standard Access List Example, Controlling VTY (Telnet) Access, Extended Access Lists, Extended Access List Example, Named Access Lists, Monitoring Access Lists • Hands on Lab	15
Network Address Translation	• Network Address Translation NAT, Introduction to Network addresses Translation (NAT), Port address translation (PAT), Static NAT, Dynamic NAT, NAT Overloading • Hands on Lab	10
WAN Protocols	• Introduction of WAN, Cabling the WAN, HDLC, PPP, LCP, Frame Relay, ISDN, DSL/ADSL • Hands on Lab	10

WIRELESS NETWORK(ADHNS-IX)

Name of Unit of Qualification   : WIRELESS NETWORK(ADHNS-IX)
Duration   : 120 Hours
Topics   : WIRELESS NETWORK

Performance Criteria (OUTCOME) No.	Contents	Hrs.
Overview of Wireless Network	• Introduction to wireless Network, different generation of Wireless System • Hands on Lab	10
Characteristics of Wireless Medium	• Radio propagation mechanisms; reflection, diffraction and scattering, multipath & Doppler • Hands on Lab	5
Physical Layer Alternatives for Wireless Networks	• Wireless transmission techniques, Consideration in the design of wireless Modem, Short Distance Base Band Transmission, Comparison of modulation themes, Coding techniques for wireless communications • Hands on Lab	5
Wireless Medium Access Alternatives	• Introduction to multiple access technique, Frequency Division Multiple Access (FDMA) and Time Division Multiple Access (TDMA),. Code Division Multiple Access (CDMA), Comparison of CDMA, TDMA, FDMA, and Random Access Methods for mobile Data Services, Access methods for wireless LANs. • Hands on Lab	10
Network Planning	• Wireless network topologies, cellular topology, cell fundamentals, capacity expansion techniques, network planning for CDMA systems. • Hands on Lab	5
Introduction to Wireless LAN	• ISM band, 802.11a/b/g wireless standards • Adhoc, infrastructure mode of WLAN, Access Point in Repeater Mode • Security in WLAN, MAC Filtering, WEP/WPA • Evaluation of WLAN, Wireless Home Networking, IEEE 802.11 standard for WLAN • Hands on Lab	30
GSM and TDMA Technology:	• What is GSM? GSM Services and features, system architecture, Call Establishment Mechanism, Handover Mechanism, Security Mechanism. • Hands on Lab	10
CDMA Technology	• What is CDMA? CDMA Forward channel, CDMA Reverse channel, packet & frame formats, mobility management • Hands on Lab	10
Mobile Data Networks	• What is mobile Data?, GPRS, Mobility Support in GPRS, Short Messaging Service in GSM, Wireless Application Protocol (WAP) • Hands on Lab	10
Bluetooth Technology	• Introduction to Bluetooth technology, Overall architecture, protocol stack, physical connection, MAC mechanism, connection management. • Hands on Lab	15
Overview of Wireless Broadband Networking	• Planning and designing wireless Broadband, satellite communications and application. • Hands on Lab	10

INFORMATION SECURITY(ADHNS-X)

Name of Unit of Qualification   : Information Security(ADHNS-X)

Duration   : 120 Hours

Topics   : Information Security

Performance Criteria (OUTCOME) No.	Contents	Hrs.
Introduction to Information Security	• Information Security: Introduction, History of Information security, What is Security, CIA Security Model, Introduction-Characteristics of Networks, Security Concepts,–Kinds of security breaches – Threats and Risks, Points of vulnerability • Attacks – Passive and Active, Security Services, Confidentiality, Authentication, Non-Repudiation, Integrity, Access Control, Availability, Components of Information System. • Hands on Lab	5
Cryptography	• Concepts and Techniques, symmetric and asymmetric key cryptography, Symmetric key Ciphers, and Asymmetric key Ciphers: Principles of public key cryptosystems, RSA algorithm, Diffie-Hellman Key exchange • Message Authentication and Hash Functions: Authentication requirements and functions, MAC and Hash Functions, MAC Algorithms: Secure Hash Algorithm, Whirlpool, HMAC, Digital signatures, X.509, Kerberos. • Hands on Lab	10
Security at Layers	• Security at layers (Network, Transport, Application): IPSec, Secure Socket Layer(SSL), Transport Layer Security (TLS), Secure Electronic Transaction(SET), Pretty Good Privacy(PGP), S/MIME • Hands on Lab	10
Intruders, Virus and Firewalls	• Intruders, Intrusion detection, password management, Virus and Related threats, Countermeasures, Firewall design principles, Types of firewalls • Hands on Lab	10
Protocols weaknesses in TCP/IP and other protocols	• Buffer overflow, brute force attacks, protocols attacks, cross site and other CGI vulnerabilities etc, Spoofing, Denial of service, Operating system Hardening, Internet protocols and security SSL.TLS, IPSec, SSH, Application security, WWW Security ,Secure Email. Antivirus, Network scanners, • Firewall, IDS, Log analysis, Security Infrastructure, PKI, VPN, Ecommerce, security, Security Audits, Asset classification and Risk Analysis, Audit Trail, Reporting, Passwords, shadow files, one-time passwords, Bio-metric based identification and authentication systems. Smart cards. Kerberos. • Hands on Lab	10
Introduction to Ethical Hacking	• Ethical Hacking Terminology, Different Types of Hacking Technologies, Different Phases Involved in Ethical Hacking and Stages of Ethical Hacking: Passive and Active Reconnaissance, Scanning, Gaining Access, Maintaining Access, Covering Tracks, • Types of Hacker Classes, Skills Required to Become an Ethical Hacker, Vulnerability Research, Ways to Conduct Ethical Hacking, Creating a Security Evaluation Plan, Types of Ethical Hacks, Testing Types, Ethical Hacking Report ,Footprinting and Social Engineering, Footprinting, Information Gathering Methodology • Competitive Intelligence, DNS Enumeration Whois, and ARIN Lookups, Types of DNS Records, Traceroute, E-Mail Tracking ,Web Spiders , Social	10

	Engineering, Common Types Of Attacks, Insider Attacks, Identity Theft, Phishing Attacks, Online Scams, URL Obfuscation, Social-Engineering Countermeasures. • Hands on Lab	
Scanning and Enumeration	• Scanning, types of Scanning , Scanning Methodology ,Ping Sweep Techniques, Nmap Command Switches, SYN, Stealth, XMAS, NULL, IDLE, and FIN Scans, TCP Communication Flag Types, War-Dialling Techniques, Banner Grabbing and OS Fingerprinting Techniques, Proxy Servers, Anonymizers, HTTP Tunnelling Techniques • IP Spoofing Techniques , Enumeration, Null Sessions, SNMP Enumeration, Steps Involved in Performing Enumeration System Hacking Understanding Password-Cracking Techniques, Understanding the LanManager Hash Cracking Windows 2000 Passwords, Redirecting the SMB Logon to the Attacker SMB Redirection, SMB Relay ,MITM Attacks and Countermeasures NetBIOS DoS Attacks, Password-Cracking Countermeasures, Understanding Different Types of Passwords Passive Online Attacks, Active Online Attacks, Offline ,Attacks Non electronic Attacks, Understanding Key loggers and Other Spyware Technologies • Hands on Lab	10
Hiding Techniques and Privilege Escalation	• Understand Escalating Privileges, Executing Applications, Buffer Overflows, Understanding Rootkits, Planting Rootkits on Windows Machines, Rootkit Embedded TCP/IP Stack Rootkit, Countermeasures, Understanding How to Hide Files, NTFS File Streaming NTFS Stream, Countermeasures, Understanding Steganography Technologies, Understanding How to Cover Your Tracks and Erase Evidence, Disabling Auditing, Clearing the Event Log • Hands on Lab	10
Trojans, Backdoors, Viruses, and Worms	• Trojans and Backdoors, Overt and Covert Channels, Types of Trojans, Reverse-Connecting Trojans, Netcat Trojan ,Indications of a Trojan Attack, Wrapping, Trojan Construction Kit and Trojan Makers ,Countermeasure Techniques in Preventing Trojans, Trojan-Evading Techniques, System File Verification Sub objective to Trojan Countermeasures Viruses and Worms, Difference between a Virus and a Worm, Types of Viruses, Understand Antivirus Evasion Techniques, Understand Virus Detection Methods Sniffers • Hands on Lab	10
Protocols Susceptible to Sniffing	• Active and Passive Sniffing, ARP Poisoning, Ethereal Capture and Display Filters, MAC Flooding, DNS Spoofing Techniques, Sniffing Countermeasures Denial of Service and Session Hijacking Denial of Service, Types of DoS Attacks, DDoS Attacks, BOTs/BOTNETs, "Smurf" Attack, "SYN" Flooding, DoS/DDoS Countermeasures, Session Hijacking, Spoofing vs. Hijacking, Types of Session Hijacking, Sequence Prediction, Steps in Performing Session Hijacking, Prevention of Session Hijacking • Hands on Lab	10
Web Application Vulnerabilities	• Hacking Web Servers, Web Application Vulnerabilities, and Web-Based Password Cracking Techniques, Hacking Web Servers, Types of Web Server Vulnerabilities, Attacks against Web Servers, IIS Unicode Exploits, Patch Management Techniques, Web Server Hardening Methods Web Application Vulnerabilities, Objectives of Web Application Hacking, Anatomy of an Attack, Web Application Threats, Google Hacking, Web Application Countermeasures Web-Based Password Cracking Techniques, Authentication Types, Password Cracker, Password Attacks: Classification ,Password Cracking Countermeasures SQL Injection and Buffer Overflows SQL Injection, Steps to Conduct SQL Injection, SQL Server Vulnerabilities, SQL Injection	10

	• Countermeasures Buffer Overflows, Types of Buffer Overflows and Methods of Detection, Stack Based Buffer Overflows, Buffer Overflow Mutation Techniques • Hands on Lab	
OS Hardening	• Windows & Linux Hardening Methods, Penetration Testing Methodologies, Security Assessments, Penetration Testing Methodologies, Penetration Testing Steps, Pen-Test Legal Framework , Automated Penetration Testing Tools • Hands on Lab	5
Introduction to Network infrastructure security	• Internet infrastructure, key components in the internet infrastructure, internet infrastructure security • Switch Security: Introduction, How switches can be attacked, • Router Security: Over view of Internet routing, External and internal attacks, RIP attacks and countermeasures, OSPF attacks and countermeasures, BGP Attacks and countermeasures • DNS Security, Introduction, DHCP attacks, DNS attacks • Hands on Lab	10

COMMUNICATION AND SOFT SKILL (ADHNS-XI)

Name of Unit of Qualification : Communication and Soft Skill (ADHNS-XI)

Duration : 20 Hours

Topics : Communication and Soft Skill

Performance Criteria (OUTCOME) No.	Contents	Hrs.
Acquiring Communication Skill	• Communication , verbal and non-verbal communication	6
Managing career, staff and professional relationships	• Building professional relationship, Relationship at work , Making the most of personal and professional relationships, Competency Description, Managing Difficult Business Relationships	6
Preparing for interview	• Interview Techniques: Planning For The Interview, Preparing for an Interview, Interview Formats, Stages Of The Interview, Types Of Interview Questions • Best Bet for Interview Preparation: Mock Interviews, The Benefits of Mock Interviews Experience & Skills, • Curriculum Vitae: Overview, types of CV, Covering letter, Writing a Resume, Acceptance Letter, Thank You Letter	8

LAB ASSIGNMENTS

ADHNS-I : PC & PERIPHERAL ARCHITECTURE

LAB ASSIGNMENTS (60 Hrs.)	
ADHNS-I : PC & PERIPHERAL ARCHITECTURE	
S.NO	**ASSIGNMENT**
1	To Study various logic Gates using trainer kit.
2	Use of NAND and NOR Gates to construct Basic Gates.
3	Identification and testing of electronic components using Digital multimeter and Component Testing and Symbols.
4	Reading the value of resistors by their color band and then verifying the same by measuring its value by DMM.
5	Soldering and Desoldering Techniques.
6	Testing of diodes with Multimeters. Making a Full wave bridge rectifier using a transformer.
7	Study of Zener diode as voltage regulator.
8	Study of a transistor, its testing with multi-meter, the use of a transistor as an amplifier and as a switch.
9	Installation & identification of various types of Pentium processors
10	To Study identification & testing of passive and active components
11	Installation & identification of various types of Expansion cards.
12	To Study of various types of motherboard and its slots.
13	Installation of two HDD in a system
14	Study of various DOS Commands.
15	Creating and using DOS Batch File.
16	Study of CMOS (BIOS) Configuration.
17	Study of POST error codes and error messages.
18	Formatting & partitioning of a hard disk drive.

ADHNS-II : OS & DIAGNOSTICS UTILITIES

LAB ASSIGNMENTS (60 Hrs.)	
ADHNS-II : OS & DIAGNOSTICS UTILITIES	
S.NO	**ASSIGNMENT**
1	Installation of different Operating Systems
2	Study of Control Panel
3	Installation Dual Operating System
4	Installation of various cards (VGA, Sound, NIC, etc.) Installation of different device drivers or Motherboard drivers.
5	Study & identification of various parts of a PC.
6	Assembly and disassembly of PC.
7	Using PC benchmarking tools.
8	Biometric Security Device Installation and Configuration.
9	Taking Data Backup and System Formatting and OS Installation.
10	Installation of Web Camera and CCTV Camera Drivers and Software.
11	Installation of CD-DVD Burning Software like: Nero 7.0 & PowerISO.
12	Installation and Troubleshooting Different types of Antivirus Software
13	Convert file system FAT to NTFS Using MS-DOS
14	Study of various OS troubleshooting issues in computer system.
15	Preventing and recovery the hard disk failures.
16	Setting of remote Desktop connection in windows 7,8 &10
17	Manage Disk through computer disk management.
18	Convert file system FAT to NTFS Using MS-DOS

ADHNS-III : BASIC NETWORKING

LAB ASSIGNMENTS	**(60 Hrs.)**
ADHNS-III : BASIC NETWORKING	

S.NO	ASSIGNMENT
1	To create a Crossover Cable using standard color-coding (RJ-45, UTP, Crimping tools).
2	To create a Straight cable using standard color-coding.
3	To identify various media (STP, UTP, Co-axial, Fiber optics etc) and its connectors.
4	To study connection to patch panel, I/O box.
5	To install NIC, installation of TCP/IP, assigning of IP address to the system.
6	To connect two PCs using a crossover cable.
7	To setup a LAN with a number of PCs using 8/16 port HUB/Switch.
8	To Use the Ping command (with all switches) to verify the TCP/IP Connection between the two workstations
9	To study TCP/IP command utility.
10	To share a file or folder on a windows Network.
11	Configuration of advance setting of Network Adapter.
12	Create a network using subnet mask 255.255.255.192.
13	IP addressing of class-A,B & C and calculating no. of host/network.
14	Study of various types of Regional Internet registry (RIR).
15	Setting of firewall and its rules.(inbound & outbound).
16	Configurations of advance sharing setting options.
17	Configuration of multiple IP address
18	Configuring ICS (Internet Connection Sharing) in Windows / 2008 Server
19	Configuring Proxy Server for managing Internet resources.`

ADHNS-IV : NETWORKING THROUGH WINDOWS SERVER 2012

LAB ASSIGNMENTS (60 Hrs.)	
ADHNS-IV : NETWORKING THROUGH WINDOWS SERVER 2012	

S.NO	ASSIGNMENT
1	Installation of server 2012, Install server core, migrate roles from previous versions of windows server, configure server core delegate administration, Deploy roles on remote servers, convert server core to/from full GUI, configure services, configure NIC teaming.
2	Configure basic and dynamic disks , manage volumes ,Create and mount virtual hard disk (VHDs),Configure storage pools and disk pools.
3	Create and configure shares, configure share permissions, configure offline files, configure NTFS permission, configure Volume Shadow Copy Service (VSS), configure NTFS quotas.
4	Add tools and applications to start screen in server 2012, Introduce to windows Server Manager Dashboard, Convert windows server 2012 to workstation.
5	Configure the Print driver, configure Enterprise Print Management, configure Printer pooling, configure Print priorities, configure print Permissions.
6	Configure IPv4 address option, configure Subnetting, configure interoperability between IPv4 and IPv6
7	Configuration of DHCP, configure scopes, configure DHCP reservation, configure client and server for PXE boot, configure DHCP Relay Agent, Authorize DHCP server
8	Deploy and configuration of DNS Service, configure Active Directory Integration of Primary zones, Configure Forwarders, configure Root hints, manage DNS cache create A and PTR records.
9	Installation of Active Directory, Join server 2012 to Domain, Add servers to Server Manager.
10	Install Roles and Features in power Shell, Add and Remove Roles in PowerShell.
11	Add or Remove a domain controller from a domain, Upgrade a Domain controller, configure a Global catalog server
12	Active directory Accounts, Create, Copy, configure and Delete users and computers, configure Templates, configure user Rights, Manage inactive and disabled accounts.
13	Create and Manage Active directory Groups, configure Group nesting, convert Groups including security, distribution, universal, domain local and domain global, manage group membership using group policy.
14	Delegate the creation and management of Active directory objects, manage default Active directory containers, create copy, configure and delete Groups and OUs.
15	Create Group Policy, configure a Central Store, Manage a starter GPOs, configure GPO links, and configure multiple local Group policies.
16	Configure User right Assignment, configure security option setting, configure security templates, configure audit policy, configure Local users and Groups, and configure User Account Control (UAC).
17	Configure Windows Firewall, configure rules for multiple profiles using group policy, and configure Windows Firewall to allow or Deny applications. Scopes, ports and users, configure authenticated firewall exceptions, Import and Export settings.
18	Install the Windows Deployment Services (WDS) Roles, configure and manage boot, install and discover Images, Update Images with Patches, hot fixes and drivers.
19	Install and configure DFS namespaces, configure DFS Replication, configure Fault Tolerance.
20	Install the FSRM role, configure Quotas, and configure File Screening.
21	Implement auditing using Group Policy and AuditPol.exe; create expression-based audit policies; create removable device audit policies
22	Configure primary and secondary zones in DNS; configure stub zones; configure conditional forwards; configure zone and conditional forward storage in Active Directory; configure zone Delegation; configure zone transfer settings.
23	Create and configure DNS Resource Records (RR) including A, AAAA, PTR, SOA, NS, SRV, CNAME, and MX records
24	Install and configure the Remote Access role; implement Network Address Translation (NAT); configure VPN settings; configure remote dial-in settings for users; configure routing
25	Configure a Network Policy Server
26	Configure System Health Valuators (SHVs); configure health policies; configure NAP enforcement using DHCP and VPN; configure isolation and remediation of non -compliant computers using DHCP and VPN; configure NAP client settings.
27	FSMO roles in server 2012, transfer and seize operation master configure a read-only domain controller (RODC)

28	IIS server configuration, Installing IIS 8 via PowerShell, Creating a Simple Website, Configuring Site Settings, Hosting Multiple Websites ,Deploying Sites ,Installing and Configuring SMTP, Adding the SMTP Server, Feature, Setting Up an SMTP Server, Adding the SMTP E-mail Feature to an IIS 8 Website, Integrating FTP into IIS 8 Web Pages, The FTP File Transfer Publishing Service ,Adding FTP to an IIS 8 Website
29	Maintain Active Directory, Back up Active Directory and SYSVOL; manage Active Directory offline; optimize an Active Directory database; clean up metadata; Active Directory restore.
30	Configure account policies, Configure domain user password policy; configure and apply Password Settings Objects (PSOs); delegate password settings management; configure local user password policy; configure account lockout settings.
31	Windows server 2012 server Core Installation, Server core rename, Server Core Network Configuration, Join Server core to Domain.
32	GUI to Server core and Server Core to GUI conversion.
33	RDS - Remote Desktop Services & RemoteApp configuration
34	To configure storage pool & NFS Server in Windows 2012 server

ADHNS-V : PROGRAMMING TOOLS AND TECHNIQUES

LAB ASSIGNMENTS (60 Hrs.)	
ADHNS-V : Programming Tools and Techniques	
S.NO	**ASSIGNMENT**
1	Installation of Turbo C/C++ compiler in Windows Installation of gcc compiler in Linux
	Program in C to addition of two numbers
2	Program in C to find whether given no is even or odd.
3	Program in C to reverse a given number.
4	Program in C to calculate sum of 5 subjects & find percentage.
5	Program in C to find factorial of a number.
6	Develop an HTML document for a web page of your college. Design the page with an attractive background color, text color and background image.
7	Write an HTML document with an example of Table format to print your Bio-Data.
8	Write HTML code to develop a web page having background in blue and title "Welcome to my home page" in red other color
9	Create an HTML document of giving details of your name, age, telephone no, address and enrolment no, aligned in proper order
10	Installation of JDK compiler in Windows/Linux and setting of path Variables
11	Program in JAVA to find whether given no is even or odd.
12	Program in JAVA to reverse a given number.
13	Program in JAVA to calculate sum of 5 subjects & find percentage.
14	Program in JAVA to find factorial of a number.
15	Installation of WAMP server in Windows/LAMP in Linux
16	Program in PHP to print "Hello Message"
17	Program in PHP and Perform all Arithmetic operations.
18	Write a program in PHP to get a number and check whether it even or odd.

ADHNS-VI: NETWORKING THROUGH LINUX

LAB ASSIGNMENTS (60 Hrs.)	
ADHNS-VI: NETWORKING THROUGH LINUX	
S.NO	**ASSIGNMENT**
1	Linux introduction & Installation of CentOS Linux
2	Using various Linux commands
3	Using VI Editor
4	Software package management using YUM
5	Installing Software from Tarballs, RPM
6	Using the mount Command to Mount & Unmount the Disks, Devices.
7	Automating Mounts with /etc/fstab
8	Setting Up User Accounts
9	Modifying and Deleting User Accounts
10	Creating Groups
11	Managing the User's Shell Environment
12	Configuring Permissions, Read, Write, and Execute: The Three Basic Linux Permissions
13	Working with Advanced Linux Permissions
14	Working with Access Control Lists(ACL)
15	Setting Quota for Users and Groups
16	Process Monitoring and Management
17	Managing the GRUB Boot Loader, The GRUB Configuration File, Installing GRUB
18	Configuring Run levels
19	Configuring the Network Card, Troubleshooting Network Connections, Testing Connectivity.
20	Configuring Telnet Server
21	Configuring FTP Server
22	Configuring SSH Server
23	Configuring an NFS Server & Client
24	Configuring the Samba Server and Client Access
25	Configuring bind DNS Server
26	Creating the DHCP Server Configuration
27	Configuring NTP Time server
28	Setting Up Apache Web server
29	Configuring SQUID Proxy Server
30	Using iptables to create a Firewall
31	Configuring mail server setup using Postfix and Roundcube
32	Configuring Directory Service (LDAP) using FreeIPA Server

ADHNS-VII : Cloud Computing

LAB ASSIGNMENTS (60 Hrs.)	
ADHNS-VII : Cloud Computing	
S.NO	**ASSIGNMENT**
1	Installation of Oracle Virtual Box
2	Creating and managing virtual machine in Oracle virtual Box
3	Installation of VM ware ESXi Server
4	Use templates and cloning to deploy virtual machines
5	Modify and manage virtual machines
6	Create and manage virtual machine snapshots
7	Installation of Microsoft Hyper -V
8	Taking Backup of VM
9	Restoring of VM
10	Setting up Virtualization software using VMWare ESX Server, Microsoft Hyper-V etc.
11	Setting up KVM.
12	Setting up Openstack.to create cloud platform
13	Study of Amazon Cloud Services.

LAB ASSIGNMENTS (60 Hrs.)	
ADHNS-VIII : ADVANCED NETWORKING	
S.NO	**ASSIGNMENT**
1	To study Cisco Router & its interface. (Console port, AUI, Serial, Auxiliary, Ethernet, Fast Ethernet, BRI)
2	To study, Switch & its interface. (Console port, Ethernet, Fast Ethernet)
3	To bring up a router first time, logging into a router, basic commands, saving NVRAM configuration.
4	To configure a router for different LAN segments.
5	To configure IP Routing by creating Static Routes. (Static Routing)
6	To study IP routing by using RIP (Routing Information Protocol)- Dynamic Routing.
7	To study IP Routing by using EIGRP (Enhanced IGRP)- Dynamic Routing.
8	To study IP Routing by using OSPF (Open Shortest Path First)- Dynamic Routing.
9	Password recovery in Cisco router using rommon mode.
10	Backing Up and Restoring the Cisco IOS,Configuration File using TFTP server
11	To bring up a Switch first time, logging into a switch, basic commands
12	To configure VLANs and Inter-VLAN Routing.
13	To manage traffic using standard IP Access list.
14	To manage traffic using Extended IP Access list
15	To manage traffic using Named IP Access list
16	Configuring Static NAT on Cisco router
17	Configuring Dynamic NAT on Cisco router
18	Configuring NAT Overloading on Cisco router
19	Configuring Port Forwarding / PAT on Cisco router

ADHNS-IX : WIRELESS NETWORK

LAB ASSIGNMENTS (60 Hrs.)	
ADHNS-IX : WIRELESS NETWORK	
S.NO	**ASSIGNMENT**
1	To study various types of Antennas. Directional, Omni Directional etyc.
2	To study installation and Configuration of Wireless LAN NIC.
3	To study installation and Configuration of Access Point.
4	Wireless LAN Setup using ADHOC mode.
5	Wireless LAN Setup using Infrastructure mode.
6	Configuring an Access Point in Repeater Mode.
7	Using Access Point as a DHCP Server
8	To study Security implementation in WLAN.
9	Detecting Wireless Network activity and security lack using Netstumbler
10	To implement Wi-Fi Protected Access (WPA) security in WLAN
11	To implement wired Equivalent Privacy (WEP) Security in WLAN
12	To implement MAC Filtering security in WLAN
13	To study Security implementation in WLAN.
14	Detecting Wireless Network activity and security lack using Netstumbler
15	To implement Wi-Fi Protected Access (WPA) security in WLAN

ADHNS-X : INFORMATION SECURITY

LAB ASSIGNMENTS (60 Hrs.)		
ADHNS-X : INFORMATION SECURITY		
1	Information Gathering & Countermeasures	• Hands-on lab for Network Discovery & Scanning, Target Enumeration, Vulnerability Assessment & Countermeasures
2	Sniffing & Countermeasures	• Hands-on lab on Sniffing, Man in the Middle Attack (MITM) and ARP Cache Poisoning
3	Brute Force Attack	• Hands-on lab on Hash Function, Password Hashes, Brute Force Attack and Types of Password Attacks
4	IP Spoofing with DoS	• Hands-on lab on IP Spoofing and DoS
5	Trojan, Backdoor & Virus& Countermeasures.	• Hands-on lab of Trojan
6	Bypassing Proxy& Countermeasures	• To Understand Spoofing Proxy Servers, Types of Proxy Servers and Web/Content Filtering • Hands-on lab to Bypassing Proxy & Countermeasures
7	SQL Injection Attack & Countermeasures	• To Understand SQL Injection, Plain SQL Injection, Blind SQL, Injection Preventive Measures and Data Validation • Hands-on lab for SQL Injection Attacks & Countermeasures
8	Code Injection & Countermeasures	• To Understand Code Injection, Types of Code Injection and DLL • Hands-on lab for Code Injection: Static Code Injection
9	E-mail Spoofing, Phishing & Countermeasures	• To Understand E-mail Spoofing, Phishing and Phishing Techniques • Hands-on lab for E-mail Spoofing, Phishing & Countermeasures
10	Hacking Wireless Network &Countermeasure	• To Understand Wireless Network Attacks, Scanning Wireless Network and Cracking WEP/WPA Key of Wireless Network • Hands-on lab for Hacking Wireless Network & Countermeasures
11	E-mail Security	• To Understand Common E-mail Protocols, E-mail Encryption and Digital Signature • Hands-on lab for E-mail Security
12	Network Traffic Monitoring	• To Understand Network Traffic Monitoring • Hands-on lab for Network Traffic Monitoring
13	Network Traffic Encryption	• To Understand IP Security, Protocols used in IPSec, Security Architecture of IPSec and Modes of IPSec • Hands-on lab for IP Security
14	Installing & Configuring Intrusion Detection System	• To Understand Intrusion Detection System, Various Types of IDS and Components used in Snort Implementation • Hands-on lab for Installing & Configuring IDS
15	Configuring Host Based Firewall	• To Understand Basic concepts of Firewall, Basic techniques for Configuring Firewall • Hands-on lab to Configuring Host Based Firewall (Windows) and Firewall (Linux)
16	Host System Hardening (Windows)	• To Understand Vulnerability Assessment and OS Hardening • Hands-on lab for Windows Server Hardening
17	Host System Hardening (Linux)	• To Understand OS Hardening • Hands-on lab for Linux Hardening
18	Evaluating Security	• To Understand Security Evaluation, Penetration Testing and Benefits of Penetration Testing. • Hands-on lab for Windows Server Penetration Testing

19	Use of CrypTool open source tool to study	• Classic methods: the Caesar cipher, the ADFGVX cipher, the double-column transposition (permutation), the Enigma encryption algorithm, etc.
		• Modern methods: the RSA and AES algorithms, hybrid encryption, algorithms based on lattice reduction and elliptic curves, etc.
		• Calculation of hash values and analysis of their sensitivity
		• Creation of Message Authentication Codes (MACs)
		• Generation of strong keys for passwords according to the PKCS#5 standard
		• compression and decompression of documents, which enables the study of file compression prior to the actual encryption of a given document
		• Generation and analysis of pseudo-random numbers
		• Demonstration of protocols for authentication und key exchange (DH)
		• Creating an electronic signature
		• Processing hybrid encryption
		• Analysis of the effect of modifications to a document on the resulting hash value
		• Sensitivity of hash algorithms
		• Generation of hash value collisions (birthday paradox)
		• Demonstration of encryption and digital signing according to the S/MIME standard
		• Authentication protocols
		• Shared secrets using the Chinese Remainder Theorem and Shamir
		• Visualizations of many algorithms (Vigenère(Vigenere), AES, Enigma, etc.)
		• Password strength tests
		• Evaluation of existing passwords
		• Generation of a password with a given minimum entropy