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| **Syllabus for Computer Application - II for B.Com. SEMESTER II****GE 2** |
| **COURSE CODE : BCOM212** | **COURSE TITLE : Information Technology(Cyber Security) - II** |
| Total Marks : 100 | Total Credits : 04 | Total Contact Hours : 60 |
| Course prerequisites : Information Technology I |
| Course objectives : To understand the basics of cyber space and accompanying cyber threats and provide the foundation for preparing, detecting and protecting against cyber threats and challenges. |
| Course contents :  |
| **Unit** | **Topic** | **Weightage** |
| **#** | **Title** | **#** | **Content** | **Hours** | **Marks %** |
| **I** | **Basics of Computer Networking** | A | Computer Networking Basics:Definition, Need ,Advantages & Disadvantages. | 1 | 30 |
| B | Transmission Media:Wired & Wireless. | 3 |
| C | Networking Devices:Repeater, Switch, Router, Gateway. | 2 |
| D | Network Topology: Bus, Star and mesh – advantages & disadvantages of each. | 2 |
| E | Types of network:PAN,LAN, MAN, WAN, internet . | 2 |
| F | IP Addressing :Static Vs Dynamic IP addresses,Public Vs Private IP addresses. | 2 |
| G | Internet:Basic terms -web page, website, URL, HTTP & HTTPS, ISP, web server, web browser, Cyber Space ,hyperlinks, hypertext, download and upload, online and offline. | 2 |
| H | Internet applications:WWW, search engine, DNS, Electronic mail(e-mail),File transfer Protocol(FTP), Internet telephony, Video conferencing, Blogs, E-commerce. | 2 |
| I | Social Networking:Basics, Types of social networking sites –General, Multimedia, Professional, Educational,Importance of Social Networking. | 3 |
| J | Security in Social networking: Safety tips for socializing (In General & w.r.t. Facebook) Reporting any security breach. | 1 |
|  |  |  | **Student Activity:** Analyze the facebook account and report the different safety features provided by facebook for the safety of the users.  |
| **II** | **Cyber Threats** | A | Basics:Definition - Cyber Threats , Cyber Attack, Cyber CrimeCyber Attackers –Hackers, Hactivists, Rogue Insiders, States/Nations etc… | 2 | 20 |
| B | Types of Cyber Attacks: 1. Device compromise
2. Service disruption
3. Data Exfilteration
4. Advance Persistent Threat(APT)
 | 2 |
| C | Cyber Attack Artifacts: Viruses, Worms, Trojan Horse, Botnet,Denial of Service (DoS,DDoS), Social Engineering - Phishing, Zero Day Attack, Cyber Stalking, E-Mail Spoofing, Pharming, Cyber Warfare, Cyber Espionage, Cyber Vandalism | 4 |
| D | Vulnerabilities and Countermeasures:Causes of each cyber-attacks type,Countermeasures to tackle each Cyber Attack artifacts. | 4 |
|  |  |  | **Student Activity:** Provide report of any cyber threat(s) faced by you/friends/any other and list the causes and steps taken to counter such attack. |
| **III** | **Security in Cyber Shopping** | A | Online Shopping:  Basics – Privacy, Sensitive Personal Information, Advantages & Disadvantages of Online Shopping. | 2 | 25 |
|  | Privacy Issues:Cookies and online tracking,Sharing Information when Shopping Online,Password Protection,Privacy Policies. | 2 |
| B | Problems associated with online shopping:Data Pharming,Hijackers,Spoofing,Online Fraud. | 3 |
| C | Safety measures in online Shopping:Encryption of DataAuthentica­tion (SSL, Digital Signature, Certificates, Hashing)Security Tokens.Steps to safeguard online shopping security and privacy. | 5 |
| D | Payments Methods:Different payment methods in online transactions, Safety practices, Best payment method(s). | 2 |
| D | **Student Activity** – Consider any two online shopping sites and compare their features(Products, usability, policy to attract customers, payment methods, safety practices etc…) |
| **IV** | **Cyber Laws and Cyber Forensic** | A | Information Technology Act(ITA) 2000 : Definition and Terminology - Internet Governance, E-Record, E-Contract, E-Forms, Adjudicating Officer, Affixing Digital signature, Certifying Authority,Sections - Section 43, Section 65. | 3 | 25 |
| B | Information Technology (Amendment)(ITAA) Act 2008: Terminology - Communication Devices, Electronic Signature,Sections : Section 66 , Section 67, Section 69. | 3 |
| C | Provisions/Laws related to e-commerce, Issues not covered under ITA & ITAA,Reporting cyber-crimes. | 2 |
| D | Digital Evidence: Definition,Categories of Evidence,Types of Evidence,Admissibility of Evidence,Forensic Examination Standards. | 2 |
| E | Forensic Investigation Steps:Evidence Collection,Preserving Digital Evidence – Special Considerations,Recovering Digital Evidence,Documenting Evidence,Documenting Evidence Analysis. | 4 |
|  |  |  | **Student Activity:** Make use of any Forensics investigation tools such as winhex and carry following tasks: Cloning and imaging of removable device, Examination of the complete directory structure, calculate hash ,Identification of pictures embedded in documents etc.) |  |

**Note:**

1. IT paper shall carry 04 credits, with no credit for lab component.
2. There shall be a theory examination of 100 Marks ( Internal Assessment – 20 Marks; End Semester Examination – 80 Marks of 2 hrs. duration)
3. There shall be four theory lectures per week of 1 hour duration per theory class.

**References:**

1. Introduction to Information Technology – ITL Education Solutions Limited –Pearson Education
2. Data Communications and Networking Tata McGraw Hill Edition B. A. Forouzan
3. Rick Lehtinen and G.T. Gangemi, Computer Security Basics, O’Reillly Media, Inc.; 2nd edition, 2006
4. Wall, David, (2007). Cybercrime: The Transformation of Crime in the Information Age. Polity Publishing
5. Michael Cross, Scene of the Cyber Crime, Syngress Publishing, Elsevier Publishing, 2nd Edition, ISBN 13: 978-1-59749-276-8
6. Chander, Harish, Cyber Laws and IT Protection, ISBN: 978-81-203-4570-6, PHI Learning
7. Facebook, https://www.facebook.com
8. Cyber Laws, <http://deity.gov.in/content/cyber-laws>
9. X-Ways Forensics ,https://www.x-ways.net/winhex/index-m.html
10. Online Shopping Safety, http://www.trendmicro.com/vinfo/us/security/news/cybercrime-and-digital-threats/eight-ways-to-ensure-a-safe-online-shopping-experience
11. www.cert.org
12. www.nist.gov

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| **Practical Assignments for Computer Application – II Lab for B.Com. SEMESTER II****GE 2** |
| **COURSE CODE : BCOM212** | **COURSE TITLE : Information Technology(Cyber Security) – II Lab**  |
| Total Marks :  | Total Credits :  | Total Contact Hours : 30 |
| Course prerequisites : None |
| Course objectives : To understand the basics of cyber space and accompanying cyber threats and provide the foundation for preparing, detecting and protecting against cyber threats and challenges. |
| Practical Assignments:  |
| **Unit** | **Topic** | **Requirements** | **Weightage** |
| **#** | **Title** | **#** | **Content** |  | **Hours** |
| **I** | **Basics of Computer Networking** | 1 | **Networking Basics*** Connecting to Network
* Sharing directories
* Connecting to shares
* Set up a common storage
 | Networked Devices | **2 hours** |
| 2 | **Advanced Networking*** Identify IP address, ping
* Set up a basic firewall
* Set up a security level
* Setup free online backup
 | Networked Devices & internet & Web Browser | **2 hours** |
| 3 | **Web browser security, Internet Connectivity & Tracing .** * Configure the web browser for optimized performance and security.
* Identify the IP address of the remote website.
* Find the public IP address of your device and your ISP.
* Find the upload and Download speed.
* Use Trace Email Analyzer to get the sender's IP address and track the source.
 | internet , Web Browser and online Trace Email Analyzer | **2 hours** |
| 4 | **Social Networking & Facebook*** Analyze the facebook account and report the different safety features provided by facebook for the safety of the users.
 | Internet & Internet Browser | **2 hours** |
| **II** | **Cyber Threats** | 5 | **Virus Threat*** Analyze any system infected with cyber threat list the causes and steps needs to be taken to counter such attack.
* Find the techniques viruses use to evade Antivirus Software.
 | Any Antivirus/ Malware detection tool | **2 hours** |
| 6 | **Spyware - Infection, Collection, Detection, and Eradication*** How spyware infects devices.
* Define the indicators of a spyware infection.
* Explore how anti-spyware software detects spyware.
* Download and install any anti-spyware software on a computer.
 | Any Antispyware tool | **2 hours** |
| 7 | **Steganography and Steganalysis****Steganography*** Hide text messages in images with simple commands.
* Hide encrypted text messages in images with 4t HIT Lite.
* Hide encrypted files in images with JPEG Hide and Seek (JPHS).

**Steganalysis** * Given two images, determine which image contains hidden information using tools such as Steganographic studio.
 | Use following software tools:* 4t HIT Mail Privacy Lite,
* JPEG Hide and Seek (JPHS),
* Steganographic studio
 | **2 hours** |
| 8 | **Password Security*** Measure brute force and dictionary cracking times for passwords of varying length and complexity with Proactive Password Auditor (PPA)
* Define the characteristics of a strong password.
* Study the relationship between password strength and cracking time.
* Calculate the total number of unique passwords given password length and number of subunits (letters, digits, or symbols).
 | Use following software tool:Proactive Password Auditor (PPA) | **2 hours** |
|  |  | 9 | **Defense in Depth - Overall Steps for Cyber security of a device(Laptop/Mobile)** |  | **2 hours** |
| **III** | **Security in Cyber Shopping** | 10 | **Privacy Protection through Cryptography*** Use tools such as Gnu Privacy Guard (GPG) to encrypt, decrypt, sign, and verify files.
 | Use following software tool:Gnu Privacy Guard (GPG) | **2 hours** |
| 11 | **Security & Privacy** * Download and install Best Free Keylogger (BFK).
* Log a computer's keystrokes using BFK.
* Research methods to defend against keyloggers.
* Explore the ethics of using keyloggers.
 | Use following software tool:Best Free Keylogger (BFK). | **2 hours** |
| 12 | **Online Shopping*** Consider any two online shopping sites and compare their features(Products, usability, policy to attract customers, payment methods, safety practices etc…)
 | Internet & Internet Browser | **2 hours** |
| 13 | **Online Banking*** Consider any online banking sites Find the features(Banking services, financial transactions, security practices etc…)
 | Internet & Internet Browser | **2 hours** |
| **IV** | **Cyber Laws and Cyber Forensic**  | 14 | **Digital Evidence** * Make use of any Forensics investigation tools such as winhex and carry following tasks:
* Cloning and imaging of removable device, Examination of the complete directory structure, calculate hash ,Compare hash after minor file modification etc...)
 | Use following software tools:* Winhex
 | **2 hours** |
| 15 | **Forensic Investigation Steps*** Make use of any Forensics investigation tools such as winhex and carry detailed forensic investigation steps and prepare the report. Include:
* Evidence Collection,
* Preserving Digital Evidence – Special Considerations,
* Recovering Digital Evidence,
* Documenting Evidence,
* Documenting Evidence Analysis.
 | Use following software tools:* Winhex
 | **2 hours** |

**Note:**

1. IT lab Component shall carry no credit.

 There shall be altogether 15 Lab sessions of 2 hours duration per batch of 20 Students.