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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 Crime  Cyber 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 Data  Authentica­tion (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.