Gujarat University
Syllabus
M.Tech (Web Technologies) – II

Subject Name: Web Security

Subject Code: MTWT – 121

Objectives:

To make students enable

- To understand necessity for securing web applications
- To know different risks to web applications
- To take the steps required to mitigate those risks

Prerequisites:

- Fundamentals of Web Applications & Database
- Fundamentals of Web Application Development
- Fundamentals of Computers

Contents:

1. **Web Application Basics:**
   Introduction, HTTP Protocol, Web Functionality, Encoding Schemes, Enumerating Content and Functionality, Analyzing the Application

2. **Authentication Security:**
   Authentication Techniques, Design Flaws in Authentication, Implementation Flaws in Authentication, Securing Authentication, Path Traversal Attacks

3. **Injection Attacks:**
   Injecting into Interpreted Contexts, SQL Injection, NoSQL Injection, XPath Injection, LDAP Injection, XML Injection, Http Injection, Mail Service Injection

4. **Cross Site Scripting (XSS):**
   Types of XSS, XSS in Real World, Finding and Exploiting XSS Vulnerabilities, Preventing XSS Attacks

5. **User Attacks:**
   Inducing User Actions, Capturing Cross-Domain Data, Client-Side Injection Attacks, Local Privacy Attacks, ActiveX Control attacks, Browser Attacks

6. **Source Code Analysis:**
   Approaches to Code Review, Signatures of Common Vulnerabilities, Analysis of Java platform, Analysis of ASP.NET platform, Analysis of PHP, Analysis of Perl, Analysis of Javascript, Analysis of SQL

References:

1) Dafydd Stuttard, "The Web Application Hacker's Handbook", Wiley India Pvt. Ltd.

Accomplishments of the student after completing the Course:

After completion of this course student will be able to know

- To detect and solve common web application security vulnerabilities.

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Subject Name: High performance Computing

Subject Code: MTWT – 122

Objectives:

To make students enable

- To understand the principles and paradigm of Cloud Computing
- To understand the Service Model with reference to Cloud Computing
- To appreciate the role of Virtualization Technologies

Prerequisites:

- Fundamentals of Distributed Computing

Contents:

1. **Introduction to Cloud Computing:**
   Overview, Roots of Cloud Computing, Layers and Types of Cloud, Desired Features of a Cloud, Benefits and Disadvantages of Cloud Computing, Cloud Infrastructure Management, Infrastructure as a Service Providers, Platform as a Service Providers, Challenges and Risks, Assessing the role of Open Standards

2. **Cloud Architecture, Services and Applications:**
   Exploring the Cloud Computing Stack, Connecting to the Cloud, Infrastructure as a Service, Platform as a Service, Saas Vs. Paas, Using PaaS Application Frameworks, Software as a Service, Identity as a Service, Compliance as a Service

3. **Abstraction and Virtualization:**
   Introduction to Virtualization Technologies, Load Balancing and Virtualization, Understanding Hyper visors, Understanding Machine Imaging, Porting Applications, Virtual Machines Provisioning and Manageability Virtual Machine Migration Services, Virtual Machine Provisioning and Migration in Action, Provisioning in the Cloud Context

4. **Managing & Securing the Cloud:**
   Administrating the Clouds, Cloud Management Products, Emerging Cloud Management Standards, Securing the Cloud, Securing Data, Establishing Identity and Presence

5. **Case-Studies:**
   Using Google Web Services, Using Amazon Web Services, Using Microsoft Cloud Services

References:

1) Sosinsky B., “Cloud Computing Bible”, Wiley India
2) Buyya R., Broberg J., Goscinski A., “Cloud Computing : Principles and Paradigm”, John Wiley & Sons
3) Velte T., Velte A., Elsenpeter R., “Cloud Computing – A practical Approach”, Tata McGrawHill.
4) Linthicium D., “Cloud Computing and SOA Convergence in Enterprise”, Pearson Education India.
5) Shroff G., “Enterprise Cloud Computing”, Cambridge University Press
6) Smooth S., Tan N., “Private Cloud Computing”, Morgan Kauffman
7) Miller Michael, “Cloud Computing: Web Based Applications that Change the Way You Work and Collaborate Online”, Pearson Education India

Accomplishments of the student after completing the course:

After completion of this course student will be able to know

- In-depth Knowledge of Cloud Computing.
- The role of Cloud Services

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Subject Name: Web Application Development - II

Subject Code : MTWT – 123

Objectives:

To make students enable to know

- What are the application of E-commerce
- Various E-commerce Strategy
- The things to be consider for E-Commerce Web site implementation

Prerequisites:

- Fundamentals of Web Applications & Database
- Fundamentals of Web Application Development
- Fundamentals of Computers

Contents:

1. **Introduction to E-Commerce:**
   Introduction, Business Model, Revenue Models and Business Process, E-Commerce Opportunity, Nature of E-Commerce

2. **E-Commerce Technology Basics:**
   Internet and WWW, Packet Switched Networks, Internet Protocols, Markup language and the web, Intranets and Extranets, Internet Connection Options, Intenet2 and Semantic Web

3. **Web Server and Email Technologies:**
   Web Server basics, Software for Web Servers, E-mail, Web Site Utility Programs, Web Server Hardware

4. **E-Business Revenue Models:**
   Revenue Models, Revenue Modles in Transition, Revenue Strategy Issues, Creating an Effective Web Presence, Web Site Uability, Connecting with Customers

5. **Selling to Consumer Online:**
   Web marketing strategies, communicating with differenet market segments, Beyond market segmentation, Advetiesing on the web, E-Mail marketing, Technology – Enabled CRM, Creating and Maintainging Brands on the Web, Search Engine Positiong and Domain names

6. **Selling-to-Business Online:**
   Purchasing, Logistic and Support Activities, Electronic Data Interchange, Supply chain management using Internet Technologies, Electronic Marketplaces and Portals

7. **Virtual Communities:**
   From Virtual Communities to Social Networks, Mobile Commerce, Online Auctions

8. **E-Business Law and Taxation:**
   Legal Environment of E-Commerce, Use and Protection of Intellectual Property in Online Business, Online Crime, Terrorism and Warfare, Ethical Issues, Taxation and E-Commerce

9. **Web Hosting and E-Business Software:**
   Web Hosting Alternatives, Basic functions of E-Commerce Software, Advanced functions of E-Commerce Software, E-Commerce software for Small and Midsize Companies, E-Commerce software for Midsize to large Business, E-Commerce software for Midsize to large Business

10. **Online Security:**
    Online Security Issues Overview, Security for Client Computers, Communication Channel Security, Security for Server Computers, Organizations that Promote Computer Security

11. **Online Payment Systems:**
    Online Payment Basics, Payment Cards, Electronic Cash, Electronic Wallets, Stored-Value Cards, Internet Technologies and Banking Industry, Criminal Activity and Payment Systems: Phishing and Identity Theft

12. **Implementing E-Business Initiatives:**
    Identifying benefits and Estimating Costs of E-Commerce Initiatives, Strategies for Developing E-Commerce Web Sites, Managing E-Commerce Implementations

References:

1) Gary P. Schneider, “e-Commerce: Strategy, Technology and Implementation”, Cengage
2) Micheal Peacock, “PHP 5 E-Commerce Development”, Packt
3) Kenneth C. Laudon & Carol G. Traver, “E-Commerce: usiness,Technology, Society**”,** Pearson
4) K.K.Bajab and Debjani Nag, “E-Commerce”, McGrawHill
5) Cristian Darie and Emilian Balan escu, “Beginning PHP and MySQL E-Commerce”, Apress
6) Larry Ullman, “Effortless E-Commerc with PHP and MySQL”, Pearson

Accomplishments of the student after completing the course:

After completion of this course student will be able to know

- The E-Commerce technology and its application in real life environment. They will build a scalable e-commerce web application.

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Subject Name: Web Server Management

Subject Code: MTWT – 124

Objectives:

To enable students to know

- The concept of web server management and apply the concepts in practical.

Contents:

1. **Installation:**
   Install Apache on Linux and Windows, Debian Packages, Subversion Sources, Apache Toolbox, Starting and stopping Apche, Restarting Apache, Apache uninstallation, Which Apache versions Version of Apache to Use, upgrades, config.nice, boot, Useful configure script, options configure Options, Finding Apache's files location Files

2. **Adding Common Modules:**
   Installing a Generic installation modules, third-party modules, Installing Unix mod_dav, Installing Windows mod_dav, Installing installation mod_perl, Unix Unix mod_perl, Installing Unix mod_php, Installing Windows mod_php ,Installing installation mod_ssl, finding Modules Using modules locating, modules.apache.org, Installing mod_security, Why Won't This modules troubleshooting Module Work?

3. **Logging:**
   Log entries, logs error, POST Contents, IP addresses and clients, MAC addresses, Cookies, Local Pages, logs rotating, Hostnames, Maintaining logs virtual hosts, Proxy Requests, IP addresses servers, Referring Page, browser, software name, logs arbitrary request, logs arbitrary response, MySQL database logs, Syslog, User Directories

4. **Virtual Hosts:**
   Setting Up Name-Based Virtual Hosts, default virtual hosts, address-based virtual hosts, virtual hosts address-based mixing with name-based, Mass Virtual Hosting with mod_vhost_alias, Mass Virtual Hosting Using Rewrite Rules, Logging for virtual hosts, Logfile, port-based virtual hosts, Displaying the Same Content on Several Addresses, Virtual Hosts in a Database

5. **Aliases, Redirecting, and Rewriting:**
   Directories URLs mapping, Creating a URLS, URLs aliasing, directories URLs mapping to same CGI directory, CGI directories creating, Redirecting URLs to another location, Permitting case-insensitive URLs, Showing PHP source, URLs (Uniform Resource Locators) replacing text, CGI arguments, requests unreferred denying access, query strings, SSL (Secure Socket Layers) redirecting, directories turning into hostnames, redirecting to single host, arguments, URLs (Uniform Resource Locators) elements, directories rewriting, query arguments, Using AliasMatch

6. **Security:**
   Authentication system, Single-Use Passwords, Expiring Passwords, Limiting Upload Size, Images from Being Used Off-Site, requiring Strong Authentication, .htpasswd Files, Digest Authentication, Security in a Subdirectory, Lifting Restrictions, Selectively, files ownership, MySQL databases User Credentials, authentication usernames, authentication passwords, brute-force password attacks, Digest authentication, Credentials Embedded in URLs, WebDAV security, WebDAV enabling, proxies URL access, files wrappers, module sets, Web Root, Restricting Range Requests, DoS attacks, mod_security, Chrooting Apache with mod_security, authentication migrating, Mixing read-only access, Using redirecting permanent

7. **SSL:**
   Installing SSL, Windows SSL installation, SSL Certificates , SSL (Secure Socket Layers) CAs, Serving a SSL, Authenticating with Client authentication SSL, virtual hosts SSL, SSL certificates wild card

8. **Dynamic Content:**
   Enabling a CGI Directory, CGI scripts enabling, CGI directories default documents, Using CGI programs launching, Using CGI scripts extensions, CGI testing setup, CGI form parameters, SSIs (Server-Side Includes) , Displaying date, last modified date, Including a Standard Header, Including the CGI program output, CGI scripts, CPAN, mod_perl Handler, PHP script handling, PHP installation, CGI parsing output, Parsing SSIs, Getting Perl scripts, Enabling Python Script Handling

9. **Error Handling:**
   A error handling host fields, CGI Scripts , Customized Error Messages, Error Documents in Multiple Languages , error handling redirecting, Internet Explorer Display Your Error Page , Notification on Error Conditions

10. **Proxies:**
    Securing Your Proxy Server, Open Mail Relay, Forwarding Requests to Another Server, Blocking Proxied Requests, mod_perl proxying content, caching proxy servers, Filtering Proxied Content, authentication Proxied Server, proxies, mod_proxy_balancer, proxies virtual hosts, FTP

11. **Performance:**
    How Much Memory You Need, Benchmarking Apache with ab, KeepAlive Settings, Getting a Snapshot of Your Site's Activity, DNS lookups, Symbolic Links, .htaccess Files, Content Negotiation, Optimizing Process Creation, Thread Creation, Caching, load balancing, Caching Directory Listings, Speeding Up mod_perl, Dynamic Content

12. **Directory Listings:**
    Directory/Folder Listings, Header and Footer on Directory Listings, Applying a Style sheet, Hiding Things from the Listing, Searching for Certain Files in a Directory Listing, directories sorting, Client-Specified Sort Order, List

directories formatting, client-specified formatting, Adding Descriptions to Files, Auto generated Document Titles, Changing the icons, Listing the Directories First, files version number, Allowing the End User to Specify Version Sorting, User Control of Output, End User to Modify the Listing, Suppressing Certain Columns, Showing Forbidden Files, directories aliases

13. **Miscellaneous Topics:**
Directives, Renaming .htaccess Files, Generating Directory/Folder Listings, Trailing Slash Problem, Content-Type headers, Header Fields, Alternate Default Document, favicon, ScriptAliased Directories, Enabling .htaccess Files, Converting SSIs (Server-Side Includes) IBM/Lotus

References:

1) Rich Bowen, Ken Coar, “Apache Cookbook”, O’Reilly
2) Ed Sawicki , “Guide to Apache” , Cengage
3) Ivan Ristic, “Apache Security”, O’Reilly
4) Steve Silva, “Web Server Administration”, Cengage
5) Rosemary Scoular, “Apache: The Definitive Guide”, Oreilly

Accomplishments of the student after completing the course:

After completion of this course student will be able to know

- To manage web server and use it effectively.

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