LNCT UNIVERSITY, BHOPAL

Programme:- BCA (AI&DA) **Semester – VI** **wef: July 2025**

Name of Paper& Category	Paper Code	Theory					
		Credit			Marks		
		L	T	J	EST	CAT	Total
Advance JAVA (Major-core)	BAI-601	3	1	0	70	30	100

Course Objective	The Objective of this course is to enhance students programming skills and establish a better understanding of the working of AWS, Hibernate, and Spring boot.

Units	Contents (Theory)	Hours /week
I	**Servlet** Servlet basics, API and Life cycle, Steps to create a servlet in server, SevletRequest and Collabration,SevletConfig and ServletContex, Session tracking and filter. JSP basics,API and Life cycle, Scripting elements, Implicit objects, Directive elements, Action elements, MVC, Ajax.	8
II	**Hibernate** Introduction and architecture, Hibernate IDE integration and Lifecycle, Generator class, Log4j, Hibernate Mapping, HQL, HCQL, Caching	8
III	**Spring** Dependency Injection, Inversion of Control, auto wiring, Spring AOP, AspectJ Annotation and XML, Spring JDBC Template, Result SetExtractor, RowMapper, NamedParameter Spring ORM, Spring with hibernate.	8
IV	**Spring MVC** Spring MVC, RequestParam, form tag libraries, MVC Validation, MVC CRUD operation, Spring MVC applications and security.	8
V	**SpringBoot and REST** Springboot architecture, JSON, Spring boot database, caching, Spring boot REST API and spring cloud components.	8

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Text Books/ Reference Books:-

Name of Authors	Titles of the Book	Edition	Name of the Publisher
E-Balagurusamy	Programming In Java	Fourth Edition	Tata McGraw Hill
Michael B. White	Mastering Java	Second Edition	BPB Publications
Ivan Bayross	Advance Java	Second Edition	BPB Publications
Fernando Monteiro	Hands-On Full Stack Web Development with Angular 6 and Laravel 5	First Edition	Packt Publishing Ltd.
Nader Dabit	Full Stack Serverless: Modern Application Development with React, AWS, and GraphQL	First Edition	O'Relly Media

COURSE OUTCOMES: Students will be able to

CO1	Extend their capabilities of servers that host application accessed by means of a request-response programming model.
CO2	Understand all concepts of Hibernate and know how and when to use parts of the Spring Framework.
CO3	Use Hibernate with Spring and understand fundamental architectural issues and create efficient object/relational mappings with Hibernate.
CO4	Develop Java based Web Applications and Restful Micro Services with minimal configuration.
CO5	The student will develop services through various URL Templates, consume and respond with JSONor XML payloads and create custom HTTP headers.

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Name of Paper& Category	Paper Code	Theory					
		Credit			Marks		
		L	T	J	EST	CAT	Total
Mobile Computing (Major-DSE-1)	BAI-602	3	1	0	70	30	100

Course Objective	The objective of this course is to explain the principles and theories of mobile computing technologies. Also to describe infrastructures and technologies of mobile computing technologies.

Units	Contents (*Theory*)	Hours /week
I	Introduction, issues in mobile computing, Characteristics of Mobile Computing, Structure of Mobile Computing, overview of wireless telephony: cellular concept.	**8**
II	GSM, air-interface, channel structure, CDMA, GPRS. Wireless Networking, Wireless LAN Overview: MAC issues, Blue Tooth, Wireless multiple access protocols, TCP over wireless, Wireless applications, data broadcasting, Mobile IP, WAP.	**8**
III	Data management issues, Hoarding techniques, data replication for mobile computers, adaptive clustering for mobile wireless networks, file system.	**8**
IV	Mobile Agents computing, security and fault tolerance, transaction processing in mobile computing environment. The Future of Mobile Computing.	**8**
V	Mobile Adhoc networks (MANETs), Routing protocols, global state routing (GSR), Destination sequenced distance vector routing (DSDV), Dynamic source routing (DSR), Ad Hoc on demand distance vector routing (AODV)	**8**

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Text Books/ Reference Books:-			
Name of Authors	**Titles of the Book**	**Edition**	**Name of the Publisher**
J. Schiller	Mobile Communications	2nd edition, 2003	Addison Wesley
Charles Perkins	Mobile IP.Design Principles and Practices	1998	Addison Wesley.
Charles Perkins	Ad hoc Networking	2008	Addison Wesley
Shambhu Upadhyaya, Abhijit Chaudhury	Mobile Computing	2008	Springer

COURSE OUTCOMES: Students will be able to	
CO1	Apply the fundamental design paradigms and technologies to mobile computing applications.
CO2	Describe the possible future of mobile computing technologies and applications.
CO3	Developing expertise in addressing data management challenges
CO4	Developing a comprehensive understanding of mobile agent computing and gaining insights into emerging trends and the future of mobile computing.
CO5	Developing expertise in the design, implementation, and management of dynamic and self-configuring wireless networks for mobile devices.

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Name of Paper & Category	Paper Code	Theory				
Information and Cyber Security (Major-DSE-2)	**BAI-603**	**L**	**T**	**EST**	**CAT**	**Total**
		3	1	70	30	100

Course Objective	The objective of this course is to study about cyber security, laws and intrusion detection.

Unit	Contents (Theory)	Hours/Week
I	**Introduction to Cyber Security:** Overview of Cyber Security, Internet Governance – Challenges and Constraints, Cyber Threats- Cyber Warfare, Cyber Crime, Cyber terrorism, Cyber Espionage, Need for a Comprehensive Cyber Security Policy, Need for a Nodal Authority, Need for an International convention on Cyberspace.	**8**
II	**Cyber Security Vulnerabilities and Cyber Security Safeguards**: Overview, Vulnerabilities in software, System administration, Open Access to Organizational Data, Weak Authentication, Unprotected Broadband communications, Poor Cyber Security Awareness. Cyber Security Safeguards- Overview, Access control, Audit, Authentication, Biometrics, Cryptography, Deception, Denial of Service Filters, Ethical Hacking, Firewalls, Intrusion Detection Systems, Response, Scanning, Security policy, Threat Management.	**8**
III	**Securing Web Application, Services and Servers:** Introduction, Basic security for HTTP Applications and Services, Basic Security for SOAP Services, Identity Management and Web Services, Authorization Patterns, Security Considerations, Challenges.	**8**
IV	**Intrusion Detection and Prevention:** Intrusion, Physical Theft, Abuse of Privileges, Unauthorized Access by Outsider, Malware infection, Intrusion detection and Prevention Techniques, Anti-Malware software, Network based Intrusion detection Systems, Network based Intrusion Prevention Systems, Host based Intrusion prevention Systems, Security Information Management.	**8**
V	**Cyberspace and the Law:** Introduction, Cyber Security Regulations, Roles of International Law, the state and Private Sector in Cyberspace, Cyber Security Standards. The INDIAN Cyberspace, National Cyber Security Policy 2013.	**8**

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Text Books/Reference Books:-

Name of Author	Title of the Book	Edition	Name of the Publisher
Ankit Fadia	E-Mail Hacking	Revised edition,2012	Vikas Publishing House .
Nina Godbole, Sunit Belapur,	Cyber Security Understanding Cyber Crime, Computer Forensic and Legal Perspectives,	2nd Edition	Willey India Publication
Dr. M Dasgupt	Cyber Crime in India	2016	Centax Publications
Barkha U, Rama Mohan	Cyber Laws and Crimes	5th Edition	Universal Laws

Course Outcome: The students will be able to:-

CO1	Become familiar with the Social and Intellectual Property issues emerging From Cyberspace.
CO2	Have depth Knowledge of Information Technology Act And Legal Frame Work Of Right To Privacy, Data Security And Data Protection.
CO3	Gaining proficiency in implementing robust security measures to protect web applications, services, and servers from vulnerabilities, attacks, and unauthorized access.
CO4	Developing expertise in identifying, mitigating, and preventing network intrusions through effective detection techniques and proactive security measures.
CO5	Understanding of legal principles and regulations pertaining to cyberspace, cybersecurity, privacy, and intellectual property rights.

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Name of Paper & Category	Paper Code	Practical				
		Credit		Marks		
		P	J	ESP	CAP	Total
Programming Lab in Advance JAVA (Major-Core)	**BAI-604**	2	-	70	30	100

Contents (Practical):

1. Implement TCP Server for transferring files using Socket and ServerSocket.

2. Implement cookies to store firstname and lastname using Java server pages.

3. Implement the shopping cart for users for the online shopping. Apply the concept of session.

4. Implement student registration form with enrollment number, first name, last name, semester, contact number. Store the details in database. Also implement search, delete and modify facility for student records.

5. Write a Servlet program to print system date and time.

6. Design a web page that takes the Username from user and if it is a valid username prints "Welcome Username". Use JSF to implement.

7. Write Hibernate application to store customer records and retrieve the customer record including name, contact number, address.

8. Write an application to keep record and retrieve record of student. The record includes student id, enrollment number, semester, SPI. Use MVC architecture.

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Name of Paper& Category	Paper Code	Practical				
		Credit		Marks		
		P	J	ESP	CAP	Total
Project (Field)	BAI-605	-	10	200	100	300

Contents (Practical):-

Process: - Project Guide of the project will be allotted by Director/Head of Department**.** Any related technology can be chosen for development of Project. It is to be done in Industry/Organization.

Evaluation parameters are:

- Problem Statement and Objective
- Technical Implementation
- Functionality and Features
- User Interface and Experience
- Data Management and Database
- Design Documentation
- Testing and Quality Assurance
- Innovation and Creativity
- Project Presentation
- Overall Project Outcome