

CASC -19P	Lab 12: Mobile Application Development		
CASC -20T	Fundamentals of IoT and Applications		
CASC -20P	Lab 14: Fundamentals of IoT and Applications		

Program Outcomes (PO):

- Gain a complete exposure to the theories and practices of Computer Application.
- Get transformed into a skilled learner and active programmer, enabling the students to focus on their higher studies.
- Value computer professionals and programmers.
- Explore how the concepts and applications of Computer lead to innovative thinking with a problem-solving attitude.

Program Specific Outcomes (PSO):

- Understand the basic computer knowledge and concept of operating systems.
- Understanding the concept of programming and develop program in C++.
- Understanding the concept of data structure and implementation with C/C++.
- Understanding the concept of DBMS and implementation in MySQL /Oracle.
- Understanding the concept of OOPs and Java programming and develop program in Java.
- Understanding the concept of web technology and its implementation with HTML/CSS/DHTML/PHP.
- Understand the basic concept of data and computer networks.
- Understanding the basic concept of digital electronics.
- Understanding the basic concept of cyber security and cyber law.
- Understanding the basic concept of Artificial Intelligence.

~~Dr. H.S. Hota~~
(Chairman)

~~Kiran~~
(Dr. K.B. Dubey)

~~Prabin~~
(Dr. S.K. Sahu)

~~U.K.~~
(Dr. U.K. Kumbhar)

~~Annu~~
(Dr. Anil Sharma)

~~Prab~~
(Dr. S. Jain) ~~R. Khuntia~~

~~Sushil~~
(Sushil Kumar Sahu)

~~Anurag~~
(11/06/21)
(Dr. Anurag Gupta)

~~Anurag~~
(Dr. Anurag Shukla Ma)

~~Sh~~
(Dr. Suresh Thakur)

~~Dr. Suresh~~
18-06-2019
(Dr. Suresh Thakur)

~~An~~
(Shailendra Arora)

~~Anjeeta~~
ANJEETA KUMAR

~~H.S.P. Tanwar~~
(H.S.P. Tanwar)

CURRICULUM STRUCTURE

Scheme

Program: BCA

Discipline: Computer Application

Semester	Course Type	Course Code	Course Title	Total Credit	Total Marks	
					Max	Min
1 st Semester	DSC (Major/Core)	CASC-01	Discrete Mathematics	4	100	40
		CASC-02T	Computer Fundamental and MS-Office	3	100	40
		CASC-02P	Lab 1: MS-Office	1	50	20
		CASC-03T	Operating System	3	100	40
		CASC-03P	Lab 2: Operating System	1	50	20
2 nd Semester	DSC (Major/Core)	CASC-04	Digital Electronics	4	100	40
		CASC-05T	Programming in C++	3	100	40
		CASC-05P	Lab 3: Programming in C++	1	50	20
		CASC-06T	Data Structure	3	100	40
		CASC-06P	Lab 4: Data Structure Using C++	1	50	20
3 rd Semester	DSC (Major/Core)	CASC-07	Software Engineering	4	100	40
		CASC-08T	Relational Database Management System	3	100	40
		CASC-08P	Lab 5: Relational Database Management System (Oracle/MySQL)	1	50	20
		CASC-09T	Programming in Java	3	100	40
		CASC-09P	Lab 6: Programming in Java	1	50	20
	DSE	CASE-01	Cyber Security and Cyber Law	4	100	40
4 th Semester	DSC (Major/Core)	CASC-10	Theory of Computation	4	100	40
		CASC-11T	Web Technology	3	100	40
		CASC-11P	Lab 7: Web Technology	1	50	20
		CASC-12T	Python Programming	3	100	40
		CASC-12P	Lab 8: Python Programming	1	50	20

*JMP
Conven*

Dr. H.S. Hota
(Chairman)

Dr. K.B. Dubey
(Dr. K.B. Dubey)

Dr. S.K. Saha
(Dr. S.K. Saha)

Dr. Anand Sharma
(Dr. Anand Sharma)

Dr. Anand Sharma
(Dr. Anand Sharma)

Dr. Anand Sharma
(Dr. Anand Sharma)

	DSE	CASE-02	Artificial Intelligence and Expert System	4	100	40
5 th Semester	DSC (Major/Core)	CASC-13	Data Mining and Data Warehousing	4	100	40
		CASC-14T	Programming in .Net	3	100	40
		CASC-14P	Lab 9: Programming in .Net	1	50	20
		CASC-15T	Machine Learning	3	100	40
		CASC-15P	Lab 10: Machine Learning	1	50	20
	DSE	CASE-03	Numerical Analysis	4	100	40
6 th Semester	DSC (Major/Core)	CASC-16	Data Communication and Computer Networking	4	100	40
		CASC-17T	Advanced Java	3	50	20
		CASC-17P	Lab 11: Advanced Java	1	100	40
		CASC-18	Major Project-1	4	50	20
	DSE	CASE-04	Computer System Architecture	4	100	40
7 th Semester	DSC (Major/Core)	CASC-19T	Mobile Application Development	3	100	40
		CASC-19P	Lab 12: Mobile Application Development	1	50	20
	DSE	CASE-05	Computer Graphics	4	100	40
		CASE-06T	Cloud Computing	3	100	40
		CASE-06P	Lab 13: Cloud Computing	1	50	20
		CASE-07	Cryptography and Network Security	4	100	40
		CASE-08	Advanced Operating systems	4	100	40
8 th Semester	DSC (Major/Core)	CASC-20T	Fundamentals of IoT and Applications	3	100	40
		CASC-20P	Lab 14: Fundamentals of IoT and Applications	1	50	20
	DSE	CASE-09	Soft Computing	4	100	40
		CASE-10	Digital Image Processing	4	100	40
		CASE-11	Big Data Analytics	4	100	40
		CASE-12	Major Project - 2	4	100	40

Dr H.S. Hota
(Chairman)

Dr K.B. Dubey

Dr. S. K. Saha

Dr. S. K. Saha

Dr. Anil Sharma

Dr. Anil Sharma

Dr. S. Datta

H.S.P. Tondle

Sushil Kumar Saha

Dr. Anil Sharma

Shri. Laxmi Prasad

ANJEETA KUMAR

Dr. Anil Sharma

Dr. Anil Sharma

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Andrew S. Tanenbaum, Computer Networks, PHI / Pearson Education Inc.
- Behrouz A. Forouzan, Data Communication and Networking, Tata McGraw-Hill.

Reference Books Recommended:

- William Stallings, Data and Computer Communication, Pearson Education.
- Nader F. Mir, Computer and Communication Networks, Pearson Education, 2007.
- Black, Data & Computer Communication, PHI

Online Resources:

- NPTEL link for Data Communication:
<https://nptel.ac.in/courses/106105082>
- Introduction to Data Communication from SWAYAM Portal
https://www.youtube.com/watch?v=swtH_okidQc&list=PLUtvcb-iqn8dG1-Cn7NTEdILR3hRVgcN&index=1
- Layered Architecture
<https://www.youtube.com/watch?v=xHO6LjSHco0&list=PLUtvcb-iqn8dG1-Cn7NTEdILR3hRVgcN&index=2>
- Data and Signal
<https://www.youtube.com/watch?v=6ZGVZ7gUccE&list=PLUtvcb-iqn8dG1-Cn7NTEdILR3hRVgcN&index=3>
- Guided Transmission Media
<https://www.youtube.com/watch?v=y7v3EAJsWXA&list=PLUtvcb-iqn8dG1-Cn7NTEdILR3hRVgcN&index=5>
- Unguided Transmission Media
<https://www.youtube.com/watch?v=hKq1tYIVxdQ&list=PLUtvcb-iqn8dG1-Cn7NTEdILR3hRVgcN&index=6>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 + 20	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
	Assignment / Seminar - 10	
	Total Marks - 30	

End Semester Exam (ESE):	Two section – A & B
	Section A: Q1. Objective – 10 x1= 10 Mark: Q2. Short answer type- 5x4 =20 Marks Section B: Descriptive answer type qts., 1out of 2 from each unit-4x10=40 Marks

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hobra
Chairman

Dr. V. N. Gupta
11/06/2024

Dr. Suresh Kumar

Dr. Shalendra Singh

Dr. Anil

Dr. Anil

Dr. Anil

Dr. Anil

Dr. Anil

Dr. Anil

ANJETA Kujur

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester - VI	Session: 2024-2025
1	Course Code	CASC-17T	
2	Course Title	Advanced Java	
3	Course Type	DSC (Discipline Specific Course)	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Understand the concepts underlying technologies in JAVA. • Work with Swings and multithreading. • Configuring Apache tomcat server. • Understand the concept of JSP. • Understand the concepts underlying client-server communication. 	
6	Credit Value	3 Credits	Credit = 15 Hours - Learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40

PART -B: Content of the Course

Total No. of Teaching-Learning Periods (01 Hr. per period) – 60 Periods (60 Hours)

Unit	Topics (Course contents)	No. of Period
I	Java Servlet: Introduction to Java Servlet, Java Servlet Life Cycle, Java Servlet API, Java Servlet Interface, Introduction to JSP, Advantages of JSP overview Servlet, JSP Life Cycle, JSP API, JSP MVC Architecture, JSP Scripting Tag, JSP Implicit Object, JSP Directive Elements, JSP Action Elements, JSP Exception Handling. Simple JSP Web Application Development.	12
II	Spring Framework: Introduction to Spring MVC Framework, Spring Modules, Development IDE (Eclipse, NetBeans, Spring Tool Suite), Spring Dependency Injection, Spring ORM, Introduction to Spring boot, Spring JPA(Hibernate), Hibernate Log4j, Hibernate Mapping.	12
III	Java Web Services: Introduction to Web Services, Web Services Architecture, Web Services Components: (SOAP, RESTful), RESTful Webservices with Spring Boot, initializing a RESTful Web Services Project with Spring Boot, Connection RESTful Webservices with Hibernate.	12
IV	Java Enterprise Application and Networking: What is EJB, Need of EJB, EJB Architecture, EJB Session Bean, EJB Entity bean, Introduction to Socket Programming, Socket API, Socket Server, Socket Client, Messaging Passing between Socket Client and Socket Server.	14

Keywords: Socket, JDBC, Servlet, Java Server page (JSP), Hibe

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Moha
 Chairman
Dr. P. S. Moha
Dr. K. S. Moha
Dr. S. S. Moha
Dr. R. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr. X. S. Moha
Dr. Y. S. Moha
Dr. Z. S. Moha
Dr. A. S. Moha
Dr. B. S. Moha
Dr. C. S. Moha
Dr. D. S. Moha
Dr. E. S. Moha
Dr. F. S. Moha
Dr. G. S. Moha
Dr. H. S. Moha
Dr. I. S. Moha
Dr. J. S. Moha
Dr. K. S. Moha
Dr. L. S. Moha
Dr. M. S. Moha
Dr. N. S. Moha
Dr. O. S. Moha
Dr. P. S. Moha
Dr. Q. S. Moha
Dr. R. S. Moha
Dr. S. S. Moha
Dr. T. S. Moha
Dr. U. S. Moha
Dr. V. S. Moha
Dr. W. S. Moha
Dr.

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester - VI	Session: 2024-2025
1	Course Code	CASC-17P	
2	Course Title	Lab 11: Advanced Java	
3	Course Type	Practical	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Understand the concepts underlying technologies in JAVA. • Work with Swings and multithreading. • Configuring Apache tomcat server. • Understand the concept of JSP. • Understand the concepts underlying client-server communication. 	
6	Credit Value	1 Credits	Credit =30 Hours Laboratory or Field Learning/Training
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
PART -B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
List of Practical Experiments.	<ol style="list-style-type: none"> 1. Program to demonstrate Swing components. 2. Program to implement Address Book using Swing components. 3. Program to demonstrate loading of file in an Swing Component. 4. Multithreading program, one of the threads print a....z and other thread print 1...26. 5. Example: 1a2b3c.... 26z. 6. Multithreading program to schedule two jobs. 7. Client Server Socket Programming. 8. Server Socket which receives data from a java client program using JSON 9. Program to fetch a particular Website tags when an URL is specified. 10. Implement stack, queue, hashmap, hashtable, enumeration, ArrayList. 11. Create a table from a java program. 12. Update a table from a java program. 13. Load a table data in Swing components. 14. Delete a record from a table, drop table from a java file. 15. Program which shows use of Statement, Prepared Statement and Callable Statement. 16. Configure Apache Tomcat and write a hello world jsp page. 17. Configure Apache Tomcat server to deploy Servlets. 18. Exceptional handling in a JSP page. 19. Create a login page and authenticate a user in a JSP page using database. 		30

20. Write a program to implement a simple servlet which writes a Welcome HTML page in the web browser.
 21. A servlet should receive a parameter from JSP page and process it.
 22. Servlet program to implement parameter handling.
 23. Servlet program to handle GET and POST request.
 24. A website hit counter data which has to be saved in a cookie.
 25. Implement a Java Beans to set and get values.
 26. Program to illustrate the procedure of handling session and print a Hello world using Java Bean.
 27. Enterprise Session Beans, deploy, and run a simple Java EE application which does add, subtract, multiply and division using stateless session bean.
 28. An application named account using stateful session bean. The purpose of account is to perform transaction operations (deposit and withdraw) for the customer.
 29. The account application consists of an enterprise bean, which performs the transactions, and two types of clients: an application client and a web client. Allow the user to properly close the frame.
 30. Install and setup Eclipse IDE for Spring Boot application development in Advance Java.
 31. Write a program in Java to demonstrate the connection of Spring boot application with Hibernate JPA.
 32. Write a program in Java to enable message passing between Client and Server using Socket Programming.
 33. Write a program in java to implement connection of RESTful Webservices with Hibernate.
 34. Write a program in java to implement REST Webservices with spring boot application.
 35. Write a program in java to implement SOAP Webservices with spring boot application.
- Note:** This is tentative list; the teachers concern can add more program as per requirement.

Keywords Socket, JDBC, Servlet, Java Server page (JSP), Hibernat.

Name and Signature of Convener & Members of CBoS:

Dr. H. S. Hota
chairman

[Signature]

[Signature]
[Signature]
(Suresh Thakur)

[Signature]
11/08/24
Dr. V. K. Sharma

[Signature]
Sheelendra Agn

[Signature]

[Signature]
ANJEETA KUMAR

[Signature]

[Signature]
Lance

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Deitel&Deitel, "Java How to program", Prentice Hall, 4 th Edition, 2000.
- Gary Cornell and Cay S. Horstmann, "Core Java Vol 1 and Vol 2", Sun Microsystems Press, 1999.
- Stephen Asbury, Scott R. Weiner, Wiley, "Developing Java Enterprise Applications", 1998.

Reference Books Recommended:

- Steven Holzner, Java2, Swing, Servlets, JDBC and JAVA Beans Programming Black Book Dreamtech press
- Herbert Schildt, The Complete Reference JAVA, Tata McGraw Hill publication, 5th Edition.
- Gajendra Gupta, Advance JAVA, Firewall Media, 1st Edition, 2006.
- Elliotte Rusty Harold, JAVA network programming, O'Reilly Publication, 3rd Edition.
- Bruce W. Perry, Java Servlet and JSP Cookbook, O'Reilly Publication, 1st Edition.
- Andrew Lee Rubinger and Bill Burke, Enterprise JAVA beans 3.1, O'Reilly Publication, 6th Edition.
- Sue Spielman, The Struts Frameworks: Practical guide for Java Programmers, Murgan Kaufmann publisher.
- Chuck Cavaness, Programming Jakarta Struts, O'Reilly Publication, 1st Edition.
- K.Santosh Kumar, Spring and Hibernate, McGraw Hill Education (India) Pvt. Limited, 2nd edition.
- John Dean, Raymond Dean, Introduction to Programming with JAVA – A Problem Solving Approach, Tata Mc Graw Hill.
- Core and Advanced JAVA (Black Book), Dreamtech Press.
- Justin Edelson, Brett McLaughlin, JAVA and XML: Solutions to real world problem, O'Reilly Publication, 6th Edition.
- Rashmi Kanta Das, Core Java for Beginners, Vikas Publishing House Pvt. Ltd.
- David Flanagan, JAVA in a Nutshell, O'Reilly Publication, 5th Edition.
- Patrik Niemeyer and Jonathan Knudsen, Learning JAVA, O'Reilly Publication, 3rd edition.

Online Resources:

- Tutorials:
 - <https://www.edureka.co/blog/advanced-java-tutorial>
 - <https://www.javatpoint.com/what-is-advance-java>
 - <https://www.w3schools.in/java>
 - <https://www.tutorialspoint.com/java/index.htm>
 - <https://www.jigsawacademy.com/blogs/tutorial/advanced-java>
 - <https://enos.itcollege.ee/~jpoial/allalaadimised/reading/Advanced-java.pdf>
- Lab manuals:
 - <https://www.gacwrm.in/learning/Computer/7MCEIP1-Advanced%20Java%20Programming%20Lab.pdf>
 - http://ggnindia.dronacharya.info/ECS/Downloads/Labmanuals/V-Sem/LM_Ad_Java.pdf
 - https://ggnindia.dronacharya.info/CSE/Downloads/Labmanuals/Aug09-Dec09/CSE%20&%20IT/VII%20Sem/Adv_java_LAB_MANNUAL_VIISem.pdf
 - <http://oseven.in/files/591337ebe6177.pdf>
 - https://www.arsdcollege.ac.in/wp-content/uploads/2020/05/Programming_in_Java_-_week9.pdf

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment (CIA): 15 Marks

End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks - 15	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
--	--	---

End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) - 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status
--------------------------	--	---

Name and Signature of Convener & Members of CBoS:

~~Dr. H.S. Hore~~
Chairman

Kron

Jal

(S)

Amey

Chal

Chal

Chal

Juridit

(S)
(Suresh Thakur)

Dr. A. S. Hore
20.05.2024

JMP
Lenelle

(S)
Shachi Undras Agni

Anjeeta
ANJEETA KUJUR

Juridit
Jachudra
Bum

Juridit

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester - VI	Session: 2024-2025
1	Course Code	CASC-18	
2	Course Title	Major Project-1	
3	Course Type	DSC (Discipline Specific Course)	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Enhance knowledge on latest techniques. • Make ready for IT industry. • Upgrade skill set as per IT industry. • Handle real word applications. • Debug Problem to make DFD of proposed system. 	
6	Credit Value	4 Credits	Credit = 15 Hours - Learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40
PART -B: Content of the Course			
Total No. of Teaching–Learning hours - 60 Hours			
	Important Guidelines for Project		No. of Period
	<p>A project report has to be submitted as per the rules described below:</p> <ol style="list-style-type: none"> 1. Number of Copies: The student should submit One hard bound copy of the Project Report with one CD/DVD. 2. No of students: Every student has to submit separate project. 3. Acceptance / Rejection of Project Report: The student must submit a project report to the Head of Department/Project Guide for approval. The Head of Department/Project Guide holds the right to accept the project or suggest modifications for resubmission. 4. Format of the Project Report :The student must adhere strictly to the following format for the submission of the Project Report <ol style="list-style-type: none"> I. Paper: The report shall be typed on white paper, A4 size or continuous computer stationary bond, for the final submission. The report to be submitted to the University must be original and subsequent copies may be photocopied on any paper. II. Typing: The typing shall be of standard letter size, double-spaced and on one side of the paper only, using black ribbons and black carbons. III. Margins: The typing must be done in the following margins Left ----- 35mm, Right ----- 20mm Top ----- 35mm, Bottom ----- 20mm IV. Binding: The Report shall be Rexene bound in black. Plastic, spiral bound Project Reports not be accepted. V. Front Cover: The front cover should contain the following details: TOP: The title in block capitals of 6mm to 15mm letters. CENTER: Full name in block capitals of 6mm to 10mm letters. BOTTOM: Name of the University, year of submission- all in block capitals of 6mm to 10mm letters on separate lines with proper spacing and centring. 		60

- VI. Blank Sheets:** At the beginning and end of the report, two white black bound papers should be provided, one for the purpose of binding and other to be left blank.
5. **Abstract:** Every report should have an abstract following the Institute's Certificate. The abstract shall guide the reader by highlighting the important material contained in the individual chapters, section, subsection etc.
 6. **Certificates etc:** The report should contain the following:
 - I. Institute Certificate: Successful completion of project by competent authority.
 - II. Acknowledgment
 - III. List of Figures
 - IV. Tables
 - V. Nomenclature and Abbreviations
 7. **Contents of the Project Report:** The project report must contain following in form of chapter, however student may include any other relevant chapter(s):
 - I. **Introduction to the project:** This chapter shall highlight the purpose of project work, it will also define the chapters to be followed in the Project Report.
 - II. **Scope of work:** Brief scope of the project work done
 - III. **Existing System and Need for proposed System:** If there is some system already in use, then give brief detail of it in order to help to understand the enhancements carried out by the student in the existing system.
 - IV. **Operating Environment:** Hardware and Software required and used.
 - V. **Proposed System:** Which may contain following:
 - a. **Objectives to be fulfilled:** clearly define the objective(s) of the system.
 - b. **User Requirements:** State the requirements of the use in an unambiguous manner.
 - c. **Requirements Determination Techniques and Systems Analysis Methods Employed:** Use the formal methods to describe the requirements of the use like Fact Finding Methods, Decision Analysis, and Data Flow Analysis etc.
 - d. **Prototyping:** If the prototypes has been developed prior to the detailed design, then give details of the prototype.
 - e. **System Feature:** Which includes as follows:
 - Module specifications
 - D.F.D. and ER
 - System flow charts
 - Data Dictionary
 - Structure charts
 - Database /File layouts
 - Design of Input Design of Output screens and reports
 - User Interfaces
 - Design of Control Procedures
 8. **Testing procedures and Implementation phase**
 9. **Problems encountered, Drawbacks and Limitations**
 10. **Proposed Enhancements/ Future enhancement**
 11. **Conclusions**
 12. **Bibliography**
 13. **Annexure**

[Handwritten signature]

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hota
Chairman

[Handwritten signatures]

Suresh Thakur

Shankar Prasad

Shankar Prasad

ANJEETA KUMAR

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Database system concept, H. Korth and A. Silberschatz, TMH Publications.
- Data Base Management System, Alexies & Mathews, Vikash publication.
- Roger S. Pressman, Software Engineering, A practitioner's Approach, 6th edition, McGraw Hill International Edition.

Reference Books Recommended:

- The Complete Reference, Kevin Loney, Oracle Press.
- SQL, PL/SQL the Programming Language of Oracle, Ivan Bayross, PustakKosh Publication.
- Microsoft SQL Server Management and Administration, Ross, STM Publications.
- James Rumbaugh, Ivar Jacobson, The unified modelling language user guide Grady Booch, Pearson Education.

Online Resources:

- SWAYAM URL link for DBMS and RDBMS: <https://youtu.be/f6LGtJutWyA>
- SWAYAM URL link for DBMS and RDBMS: <https://swayam.gov.in/courses/4434-data-base-management-system>
- Introduction of RDBMS from SWAYAM : https://onlinecourses.nptel.ac.in/noc19_cs46/preview
- Introduction to DMBS: <https://www.w3schools.in/dbms/intro>
- NPTEL YouTube Channel: Software Engineering Lectures by Prof Rajib Mall, IIT Kharagpur <https://youtube.com/playlist?list=PLbRMhDVUMngf8oZR3DpKMvYhZKga90JVt&si=tTBITZUdivHpNzIH>
- NPTEL YouTube Channel: Software Engineering Lecture Series https://youtube.com/playlist?list=PL8751DA481F0F0D17&si=071fYV7GP8_oc1xZ

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

End Semester Exam (ESE): 100 Marks

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hota
Chairman

Kiran
S.

(Suresh Thakur)

Dr. H. S. Hota
Dr. V. K. Gupta

Shantilal
Agar

Pral
Anny

Anjeeta
ANJEETA KUMAR

Alk
Anny
Anny

Anny
Anny

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Computer Application <i>(Certificate / Diploma / Degree/Honors)</i>		Semester - VI	Session: 2024-2025
1	Course Code	CASE-04	
2	Course Title	Computer System Architecture	
3	Course Type	DSE (Discipline Specific Elective)	
4	Prerequisite (if, any)	As per Program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Understand the architecture and functioning of computer systems at the hardware level. • Analyze the Instruction Set Architecture (ISA) • Understand the functioning of the CPU. • Understand the concept of parallel processing with their applications. • Understand the communication between the peripheral devices and CPU. • Explore the concepts of Memory Organization. 	
6	Credit Value	4 Credits	<i>Credit = 15 Hours - learning & Observation</i>
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40
PART -B: Content of the Course			
Total No. of Teaching–Learning Periods (01 Hr. per period) – 60 Periods (60 Hours)			
Unit	Topics (Course contents)		No. of Period
I	Fundamentals Of Basic Computer Organization And Design: Introduction of digital components, register and its types(DR,AR,AC,IR,PC,TR,INPR,OUTR), register transfer and register transfer language, micro operations and its types, common bus system for register and memory organization, computer instruction, basic format of instruction, types of instruction according addressing field (zero, one, two, three addressing), types of instruction (MRI,NMRI), addressing modes, instruction cycle and its flowchart, types of control unit(hardwired and microprogrammed control unit), design of control unit in basic computer.		15
II	Central Processing Unit and Parallel Processing Techniques: Introduction to CPU, general register organization, stack organization (register stack, memory stack), application of stack organizations, CPU instructions (data transfer instruction, data manipulation instruction, program control instructions), RISC and CISC instructions, interrupts and its types, interrupt cycle. Flynn’s classification of computers, Parallel processing techniques (pipeline processing, vector processing, array processing), pipeline processing concept, types of pipelines and its application, speedup ratio of a pipeline, vector processing concept and its applications, concept of array processing and its applications.		15
III	Input – Output Organization: Introduction to peripheral devices, input-output interface and its designing, Modes of data transfer (synchronous and asynchronous data transfer), controls in asynchronous data transfer (strobe control and handshaking control), modes of data transfer (programmed i/o, interrupt-initiated i/o and direct memory access), input-output processor.		15
IV	Memory Organization and Multiprocessor Architecture: Memory hierarchy, main memory and its organization (RAM and ROM Chips, memory address map, memory connections to CPU), auxiliary memory, associative memory, concept of cache memory, cache memory mapping techniques (associative mapping, direct mapping, set-associative mapping), cache coherence problem and its solution, introduction to multiprocessors, interconnection structures of multiprocessor-based systems, inter-processor communication and synchronization.		15
Keywords	Registers, Micro operation, Instruction, Control Unit, Instruction Cycle, Interrupt Cycle, CPU, Stack,		

