

**KADI SARVA VISHWAVIDYALAYA**  
**BCA- SEM- VI**  
**BCA 601 EMERGING TECHNOLOGIES & TOOLS - II**

**Rationale:** The goal of the course is to heave the awareness of latest technologies among the students. To understand the concepts and architecture of the various hardware technologies. To get aware about the need of new technologies in the real world scenario.

**Learning Outcome:** Students will be exposed to various emerging technologies such as RFID, Ubiquitous Computing, Biometrics, SMS and Instant Messaging, High Performance Computing, and etc.

**Teaching and Evaluation Scheme:** The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of internal examinations which consist of Term Work such as class test, quizzes, class participation, home assignments, presentation, Regular Attendance (i.e. Minimum 85% ), Internal marks which consist of 40 (20 Term Work + 20 Sessional Exams) marks and External marks which consist of 60 for University examination.

Sr. No./ Subject Code	Subject Title	Teaching Scheme			Exam Scheme					
		Th./ Tut	Pr.	Tot	Theory		Practical		T.W + Sessional Marks	Total Marks
					Hrs	Max Marks	Hrs	Max Marks		
BCA 601	Emerging Technologies & Tools - II	4	-	4	3	60	-	-	40	100

**Course Content:**

**Unit 1: RFID**

**[20%]**

**Introduction to Radio Frequency Identification (RFID)**

- Background and definitions
- Automatic identification technology (Auto-ID)
- RFID – bar code comparison

**Elements of an RFID system**

- Radio frequencies: LF, HF and UHF Systems
- Tag-reader communication
- RFID tags: Power sources of passive, semi-passive, and active tags and relationships between frequencies (LF, HF and UHF), tag-reader communication and how tags are powered.
- RFID readers
  - 1) Reader forms: fixed, modules, printers, and portables
  - 2) Reader components
  - 3) Reader configurations and frequency ranges.

**Applications of RFID**

**No. of Lectures: 6**

## Unit 2: Ubiquitous Computing

[25%]

- Software infrastructure for ubiquitous computing that can support the integration between our physical space and virtual computing space
- Embedding computing into everyday objects
- User interfaces for ubiquitous computing
- Security and privacy to protect access to user context information
- Migration where an application context can migrate from one computing environment to another computing environment
- Spontaneous interaction where appliances and services can seamlessly interact and interoperate with each other with little or no prior agreements
- Social computing that applies ubiquitous computing techniques and everyday computing artifacts to improve our social lives.

No. of Lectures: 7

## Unit 3: Biometrics

[25%]

- **Introduction to Biometrics**  
What is Biometrics? Why Biometrics? Authentication, Data Acquisition, Identification, Verification, Key Biometrics terms, System Model, Different Biometrics technologies, Comparison of Biometrics technologies
- **Fingerprint Identification & Facial scan Systems**  
History, Components, Working of Fingerprint technology, Deployment, Strengths, Weaknesses, Applications  
Facial scan: Components, Face detection, Working of Facial scan technology, Deployments, Strengths, Weaknesses, Face recognition technologies.
- **Voice Recognition and Signature scan system**  
Voice recognition Components, Working, Deployments, Strengths, Weaknesses, Performance issues, Applications. Signature scan recognition details.
- **Smart card Technologies**  
Introduction to smart-card. Smart-card chips, Temper resistance, Smart-card characteristics, Smartcard Reader, Current applications of Smart-card, Smart-card platforms and operating systems, Smart-card security.

No. of Lectures: 7

## Unit 4: SMS and Instant Messaging

[20%]

- Introduction to SMS Messaging
- Example Applications of SMS Messaging
- What is an SMS Center / SMSC?
- Basic Concepts of SMS Technology
- Intra-operator SMS Messages
- Inter-operator SMS Messages
- What is an SMS Gateway?
- Introduction to Instant Messaging,
- Overview of One to one messaging,
- Group messaging,
- Applications of Instant Messaging

No. of Lectures: 6

## Unit 5: High Performance Computing

[10%]

- Overview of HPC
- Applications of HPC.
- Architecture of HPC
- Advantages of HPC
- Disadvantages of HPC

No. of Lectures: 4

**TOTAL NO OF LECTURES: 30**

### Reference Books:

- RFID: Radio Frequency Identification by Steven Shepard.
- RFID Systems: Research Trends and Challenges by Midrib Bolic, David Simplot-Ryl, Ivan Stojmenovic.
- Ubiquitous computing: smart devices, environments and interactions by Stefan Poslad
- Ubiquitous computing fundamentals by John Krumm.
- Biometrics: identity verification in a networked world by Samir Nanavati, Michael Thieme, Raj Nanavati.
- Biometrics: Theory, Methods, and Applications by N.V.Boulgouris.
- Mobile Messaging Technologies and Services: SMS, EMS and MMS, by Gwenaël Le Bodic, Wiley Publication.
- Introduction to High Performance Scientific Computing Paperback, by Victor Eijkhout.

### Instructional Strategies:

1. Building Background & gain attention.
2. Classroom Instructions.
3. Review and check of Prior knowledge through interaction (Q&A).
4. Guided Practice through examples.
5. Independent Practice through assignments.
6. Demonstration for visualization.
7. Problem Solving methodologies.
8. Use of graphics organizers for reference and output visualization.
9. Problem Solving.

### Teaching and Examination Scheme :

UNIT	Examination Scheme % weightage	Teaching Scheme No. of Lecture
Unit 1	20	6
Unit 2	25	7
Unit 3	25	7
Unit 4	20	6
Unit 5	10	4
<b>Total</b>	<b>100</b>	<b>30</b>