DEPARTMENT OF COMPUTER APPLICATIONS
NATIONAL INSTITUTE OF TECHNOLOGY
TIRUCHIRAPPALLI - 620 015, TAMIL NADU, INDIA

| COURSE PLAN (PART I) | | | |
|---|---|---|---|
| **Name of the programme and specialization** | M.C.A | | |
| **Course Title** | **Deep Learning Lab** | | |
| **Course Code** | **CA706** | **No. of Credits** | 2 |
| **Course Code of Pre-requisites** | - | | |
| **Session** | **January 2026** | **Section (if, applicable)** | B |
| **Name of the Faculty** | Dr. SELVAKUMAR. K. | **Department** | Computer Applications |
| **E-mail** | Kselvakumar K | **Telephone No.** | 2503737 |
| **Course Coordinator(s) (if, applicable)** | Dr. Balaji Banothu | | |
| **E-mail** | balaji@nitt.edu | **Telephone No.** | 8971027077 |
| | Laboratory | | |

**COURSE CONTENT (Approved in Senate)**

**Lab Experiments:**

- Problem Selection
- Data Collection & Generation
- Data Preprocessing Techniques
- Design and Develop Deep Learning Models
  - CNN based Models
  - RNN based Models
  - Deep Q-learning & SARASA learning models
  - Reinforcement Learning Models (Q-Learning, SARASA learning)
  - GAN & VAE Models
- Model Evaluation Metrics
- Model Deployment

**COURSE LEARING OBJECTIVES**

- To introduce basic deep learning techniques.
- To develop the skills in using recent deep learning software for solving practical problems in high-performance computing environment.
- To develop the skills in applying appropriate deep learning algorithms for solving practical problems.

**COURSE OUTCOMES (CO)**

| Course Outcomes | | Aligned Programme Outcomes(PO) |
|---|---|---|
| After successful completion of the course, the students should be capable to: | | |
| CO1 | Implement and apply deep learning algorith solve problems. | |
| CO2 | Use deep learning techniques in a high-performance computing environment to sol real-world problems | |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | ✓ | | | | | |
| CO2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |

**COURSE PLAN (PART II)**

**COURSE OVERVIEW**

The Deep Learning Lab course provides hands-on exposure to fundamental and advanced deep learning techniques. It focuses on practical problem-solving using modern deep learning frameworks and tools. Students learn the complete workflow starting from problem selection and data collection. The course emphasizes data preprocessing techniques essential for effective model training. Learners design and develop deep learning models such as CNNs and RNNs. Advanced topics including Reinforcement Learning, Deep Q-Learning, SARSA, GANs, and VAEs are explored. Model evaluation using appropriate performance metrics is an integral part of the lab. Students gain experience in deploying trained deep learning models. The course promotes the use of high-performance computing environments for experimentation. Overall, it equips students with practical skills to apply deep learning in real-world applications.

**COURSE TEACHING AND LEARNING ACTIVITIES**

| Sl. No. | Week | Topic | Mode of Delivery |
|---|---|---|---|
| 1. | Week 1<br><br>(3 Classes) | Problem Selection<br>Data collection & Generation | Hands-On |

| | | | |
|---|---|---|---|
| 2. | Week 2<br><br>(3 Classes) | Data Preprocessing Techniques | Hands-On |
| 3. | Week 3<br><br>(3 Classes) | CNN based Models & Its Implementation | Hands-On |
| 4. | Week 4<br><br>(3 Classes) | RNN based Models | Hands-On |
| 5. | Week 5<br><br>(3 Classes) | Deep Q-learning | Hands-On |
| 6. | Week 6<br><br>(3 Classes) | SARASA learning models | Hands-On |
| 7. | Week 7<br><br>(3 Classes) | Reinforcement Learning Models (Q-Learning, SARASA learning) | Hands-On |
| 8. | Week 8<br><br>(3 Classes) | GAN & VAE Models | Hands-On |
| 9. | Week 9<br><br>(3 Classes) | Model Evaluation Metrics | Hands-On |
| 10. | Week 10<br><br>(3 Classes) | Model Deployment | Hands-On |

**COURSE ASSESSMENT METHODS**

| Sl. No. | Mode of Assessment | Week / Date | Duration | % Weightage |
|---|---|---|---|---|
| 1. | Lab Assessment 1/ Review-1 | 6 | 3 | 20 |
| 2. | Lab Assessment 2/ Review-2 | 13 | 3 | 20 |
| 3. | Observation Maintenance & VIVA - VOCE | Every week | | 10 |
| 4. | Compensation Lab Assessment | 15 | 3 | 20 |
| 5. | Final Lab Assessment/ Final Review | 16 | 3 | 50 |

**COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)**

- The students may give their feedback at any time to the course teacher.
- The students may also give their feedback during Class Committee Meetings.
- "Course Outcome Survey" form will be distributed on the last working day to all the students and the feedback on various rubrics will be analyzed.
- The Cos will be computed after arriving at the final marks.

**COURSE POLICY** (including compensation assessment to be specified)

- **Attendance**
  100% is a must. However, relaxation will be given for leave on emergency requirements (on medical grounds) and representing institute events. Minimum 75% attendance is required for writing Semester exams.
  Compensation Assessment will be conducted for those who could not attend any one assessment for valid reason with the approval of Head of the Department.

**ATTENDANCE POLICY**

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade. Students awarded 'V' grade must compulsorily redo the course.

**ACADEMIC DISHONESTY AND PLAGIARISM**

**Academic Dishonesty**

a) Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty

b) Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
c) The department disciplinary committee constituted with the faculty member, PAC Chairperson, and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student found guilty,

**ADDITIONAL COURSE INFORMATION**

The students can get their doubts clarified at any time with their faculty member with prior appointment.
NPTEL Course: Deep Learning by Prof. Prabir Kumar Biswas IIT Kharagpur

**FOR APPROVAL**

| Course Faculty | Chairperson (Class Committee) | HoD |
|---|---|---|
| (Dr. Selvakumar K) | (Dr. Balaji Banothu) | (Dr. S. Domnic) |