Lesson Plan No.1	Course Name: Artificial Intelligence Topic: Introduction to AI	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the role of AI in real world b) Realise about its evolution c) Learn about its different applications
Teaching Aids (if any)	a) PowerPoint Presentation
Teaching Development	1. **Introduction** (5 minutes) Ask questions - What do you mean by Artificial Intelligence? - Where do you find AI being used? - Name few examples of AI in real world. 2. **Development** (30 minutes) - Definition/Introduction of AI - Evolution of AI - Examples of AI - Goals of AI 3. **Exercise** (5 minutes) - Ask students to explain role of AI - Use Nearpod to collect responses and discuss the answers.
Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings - Suggested Video Lecture **https://nptel.ac.in/courses/106/102/106102220/** - **Suggested reading** https://www.javatpoint.com/artificial-intelligence-ai - **Suggested References:** 1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig 2. Introduction to Artificial Intelligence and Expert Systems by Dan W. Patterson - Discussion on expected / sample questions. - **Home Assignment:** • Write a short note on the evolution of AI • Define AI with examples and discuss its applications • What are some of the main challenges in Artificial Intelligence? • What are the different domains/Subsets of AI?

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Evaluation	1. Reflective Questions (What, why, Who?). Allow students to answer and discuss.
	2. Responses acquired from Quiz on AI
	Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No.2	**Course Name: Artificial Intelligence** **Topic: Turing Test & Turing machine**	**Course No.: MCA-205**

Objectives	At the end of the lesson the student shall be able to:
	  a) Understand the concept of Turing Test
	  b) Realise about its evolution
	  c) Learn about the working of Turing machine

Teaching Aids (if any)	• PowerPoint Presentation

Teaching Development	1. **Introduction** (5 minutes)
	     Ask questions
	     Who was Alan Turing & why the term Turing test?
	2 **Development** (30 minutes)
	  History of Turing test
	  Definition of Turing Machine
	  Working of Turing machine
	3 **Exercise** (5 minutes)
	    • Ask students to explain the features of Turing test
	    • Use Google form to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	  https://nptel.ac.in/courses/106/106/106106049/
	
	- **Suggested Reading**
	
	  https://www.javatpoint.com/turing-test-in-ai
	
	  - **Suggested References:**
	    1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	    2 Introduction to Artificial Intelligence and Expert Systems by Dan W. Patterson
	
	- Discussion on expected / sample questions.
	
	- **Home Assignment:**
	  • What are its key components (e.g., tape, head, states)?
	  • What is a Turing Machine?
	  • Explain the concept of a Turing Machine in simple terms.
	  • What is the goal of the test for the machine?

Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss. • Responses acquired from Quiz on Turing Machine Spend **5 minutes** to evaluate student assimilation of the lesson contents

Lesson Plan No.3	Course Name: Artificial Intelligence Topic: Rational Agents	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the concept of Rational Agents b) Learn about the working of Rational Agents
Teaching Aids (if any)	• PowerPoint Presentation

Teaching Development	1. **Introduction** (5 minutes)
	     Ask questions
	     • Who is an agent?
	     • What are different approaches/definitions of AI?
	2. **Development** (30 minutes)
	     • Introduction to Rational Agents
	     • Explanation on its working.
	     • Discussion on various approaches to AI.
	3. **Exercise** (5 minutes)
	     • Ask students to explain the features of Turing test
	     • Use Google form to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	  https://nptel.ac.in/courses/106/106/106106049/
	
	- **Suggested reading**
	  https://www.geeksforgeeks.org/rational-agent-in-ai/
	
	- **Suggested references:**
	  1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	  2. Introduction to Artificial Intelligence and Expert Systems by Dan W. Patterson
	
	- Discussion on expected / sample questions.
	
	- **Home Assignment:**
	  • What is a rational agent in the context of AI?
	  • What are the different types of rational agents?
	  • How do rational agents differ from other types of AI systems?

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Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss.
	• Responses acquired from Quiz on rational agent
	• Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No.4	Course Name: Artificial Intelligence Topic: State Space Representation	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to:
	    a) Understand the State Space Representation of Problems
	    b) Learn about its significance
	    c) Analyze the process of solving games

Teaching Aids (if any)	• PowerPoint Presentation
Teaching Development	1. **Introduction** (5 minutes) Ask questions What is tic-tac-toe? What is the strategy used to solve the game of 8-queen puzzle? 2. **Development** (30 minutes) Definition/Introduction of state space representation Explanation on Representation of problems Discussion on Tic-Tac-Toe,8-queen problem,8-puzzle problem 3. **Exercise** (5 minutes) • Ask students to explain the strategy used in above mentioned problems. Use Google form to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	    https://www.youtube.com/watch?v=xajgSUci9zs
	Discussion on expected / sample questions.
	
	- **Suggested reading**
	https://www.geeksforgeeks.org/state-space-search-in-ai/
	
	- **Suggested References**:
	1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	2. Introduction to Artificial Intelligence and Expert Systems by Dan W. Patterson
	
	- **Home Assignment:**
	  • What is State Space Representation?
	  • Explain the core idea behind state space representation in the context of AI.
	  • How does it differ from other problem-solving approaches?
	  • What are the essential elements of a state space representation?

Evaluation	1. Reflective Questions (What, why, Who?). Allow students to answer and discuss.
	2. Responses acquired from Quiz on State Space Representation
	Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No.5	Course Name: Artificial Intelligence Topic: Game Playing	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the concept of Game playing b) Learn about its significance c) Analyse the process of solving games
Teaching Aids (if any)	• PowerPoint Presentation
Teaching Development	1. **Introduction** (5 minutes) Ask questions What is Game playing? What is the strategy used to solve the game of 8-queen puzzle? What is the strategy used to solve the Tic-Tac-Toe? 2. **Development** (30 minutes) Definition/Introduction of Game playing Explanation on Plausible move generator Discussion on static evaluation function 3. **Exercise** (5 minutes) • Ask students to explain the strategy used in above mentioned problems. Use Google form to collect responses and discuss the answers.
Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings - **Suggested Video Lecture** https://www.youtube.com/watch?v=RuWFxh9aRmc - **Suggested reading** https://www.geeksforgeeks.org/game-playing-in-artificial-intelligence/ - **Suggested References:** 1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig 2. Introduction to Artificial Intelligence and Expert Systems by Dan W. Patterson Discussion on expected / sample questions. **Home Assignment:** • Write a short note on the Game playing • Explain the terms Plausible move generator & Static evaluation function. • Explain the core concept of game playing within the field of AI.

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Evaluation	- Reflective Questions (What, why, Who?). Allow students to answer and discuss. - Responses acquired from Quiz on game playing Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No.6	Course Name: Artificial Intelligence Topic: Minimax Algorithm	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to:
	    a) Understand the concept of Minimax Algorithm
	    b) Learn about its significance
	    c) Analyse the process of solving game tree

Teaching Aids (if any)	• PowerPoint Presentation

Teaching Development	1. **Introduction** (5 minutes) Ask questions
	    • What is Game playing?
	    • What is the strategy used to solve the Tic-Tac-Toe?
	2. **Development** (30 minutes)
	    • Definition/Introduction of Minimax Strategy
	    • Explanation on Minimax Search procedure
	    • Discussion of algorithm using Minimax Algorithm
	3. **Exercise** (5 minutes)
	    • Ask students to explain the strategy used in above mentioned algorithm.
	Use Google form to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	https://www.youtube.com/watch?v=a2tqR2eUlek
	
	- **Suggested reading**
	https://www.javatpoint.com/mini-max-algorithm-in-ai
	
	    - **Suggested References**:
	    1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	    2. Introduction to Artificial Intelligence and Expert Systems by Dan W. Patterson
	
	Discussion on expected / sample questions.
	
	    - **Home Assignment**:
	    • Write a short note on the Minimax algorithm with one example
	    • What is the Mini-Max Algorithm?
	    • Explain the basic principle of the Mini-Max algorithm.
	    • How does it work in a two-player game?

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Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss. • Responses acquired from Quiz on Minimax Algorithm Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No.7	Course Name: Artificial Intelligence Topic: Alpha Beta Algorithm	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to:
	    a) Understand the concept of Alpha Beta Algorithm
	    b) Learn about its significance
	    c) Analyse the process of solving game tree

Teaching Aids (if any)	• PowerPoint Presentation

Teaching Development	1. **Introduction** (5 minutes)
	    Ask questions
	        What is Minimax Algorithm?
	        What is the strategy used to solve the game tree using Minimax?
	2. **Development** (30 minutes)
	    Definition/Introduction of Alpha Beta Algorithm
	    Explanation on key points
	    Discussion on its working
	3. **Exercise** (5 minutes)
	Ask students to explain the strategy used in above mentioned algorithm
	 Use Google form to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	    https://www.youtube.com/watch?v=0oqhN5tvLgA
	
	- **Suggested reading**
	    https://www.javatpoint.com/ai-alpha-beta-pruning
	
	- **Suggested References**:
	1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	2. Introduction to Artificial Intelligence and Expert Systems by Dan W. Patterson
	
	Discussion on expected / sample questions.
	
	Home Assignment:
	• What is the Alpha-Beta Algorithm?
	• Explain the basic principle of the Alpha-Beta algorithm.
	• How does it relate to the Mini-Max algorithm?
	• What are the conditions under which a branch of the game tree can be pruned using Alpha-Beta pruning?

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Evaluation	- Reflective Questions (What, why, Who?). Allow students to answer and discuss. - Responses acquired from Quiz on Alpha Beta Algorithm Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No.8	Course Name: Artificial Intelligence Topic: Expert Systems	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the significance of Expert System b) Learn about its different components c) Enlist its characteristics.
Teaching Aids (if any)	a) PowerPoint Presentation
Teaching Development	1. **Introduction** (5 minutes) Ask questions - What do you mean by Expert systems? - Where do you find Expert systems being used? - Name few experts systems you know. 2. **Development** (30 minutes) - Definition/Introduction of ES - Block diagram of Expert system - Description of each block in detail - Working of components of ES 3. **Exercise** (5 minutes) - Ask students to identify and explain role of each component. - Use Google Form to collect responses and discuss the answers.
Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings - **Suggested Video Lecture** https://nptel.ac.in/content/storage2/courses/126104006/LectureNotes/Week-3_Expert%20Systems.pdf https://www.youtube.com/watch?v=lyrFcgqFmIk - **Suggested Reading** https://www.javatpoint.com/expert-systems-in-artificial- intelligence - **Suggested References**: 1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig 2. Introduction to Artificial Intelligence and Expert Systems by Dan W. Patterson - Discussion on expected / sample questions. - **Home Assignment:** 1. Explain Expert systems with components 2. What is the significance of Expert Systems and enumerate its characteristics 3. What is an Expert System? 4. Explain the basic concept of an expert system. 5. How do expert systems simulate human expertise?

Evaluation	1. Reflective Questions (What, why, Who?). Allow students to answer and discuss.
	2. Responses acquired from Quiz on Expert System
	Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No.9	Course Name: Artificial Intelligence Topic: Expert Systems development Life Cycle	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the concept of ESDLC b) Comprehend its various phases
Teaching Aids (if any)	a) PowerPoint Presentation
Teaching Development	1. **Introduction** (5 minutes) Ask questions - What do you mean by Expert system? - What do you mean by SDLC? - Why is SDLC required? 2. **Development** (30 minutes) - Definition/Introduction of ESDLC - Block diagram of Expert system Development life Cycle - Description of each phase in detail 3. **Exercise** (5 minutes) - Ask students to enlist the various phases of ESDLC. - Use Google Form to collect responses and discuss the answers.
Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings - **Suggested Video Lecture** https://www.youtube.com/watch?v=lyrFcgqFmIk - **Suggested reading** https://www.javatpoint.com/expert-systems-in-artificial-intelligence - **Suggested References**: 1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig 2. Introduction to Artificial Intelligence and Expert Systems by Dan W. Patterson - Discussion on expected / sample questions. - **Home Assignment:** 1. Explain the concept of Expert Development Life Cycle 2. Discuss the various phases of Expert Development Life Cycle 3. Briefly describe the activities involved in each phase. 4. What are the challenges and considerations in managing the Expert Systems development Life Cycle?

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Evaluation	1. Reflective Questions (What, why, Who?). Allow students to answer and discuss. 2. Responses acquired from Quiz on Expert System Development Life Cycle Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No.10	Course Name: Artificial Intelligence Topic: MYCIN & DENDRAL expert systems	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the concept of various types of Expert systems b) Comprehend the characteristics of each type.
Teaching Aids (if any)	a) PowerPoint Presentation

Teaching Development	1. **Introduction** (5 minutes) Ask questions
	   - What do you mean by Expert system?
	   - What do you mean by ESDLC?
	2. **Development** (30 minutes)
	   - Definition/Introduction of MYCIN and DENDRAL
	   - Block diagram of MYCIN Expert system
	   - Description of its characteristics
	3. **Exercise** (5 minutes)
	   - Ask students to enlist the various types of Expert systems .
	   - Use Google Form to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	  https://www.youtube.com/watch?v=lyrFcgqFmIk
	
	- Discussion on expected / sample questions.
	
	- **Suggested reading**
	  https://www.javatpoint.com/expert-systems-in-artificial-intelligence
	
	  - **Suggested References**:
	  1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	  2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	
	- **Home Assignment:**
	  • Explain the working of MYCIN
	  • Discuss the concept of Dendral Expert systems
	  • What is MYCIN?
	  • Explain MYCIN's purpose as an expert system.
	  • What type of medical conditions did it diagnose?

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Evaluation	1. Reflective Questions (What, why, Who?). Allow students to answer and discuss.
	2. Responses acquired from Quiz on MYCIN & DENDRAL expert systems
	Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No.11	Course Name: Artificial Intelligence Topic: Propositional logic	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the role of propositional logic in AI b) Learn about its various types c) Enlist the operations used in framing the PL
Teaching Aids (if any)	• PowerPoint Presentation

Teaching Development	1. **Introduction** (5 minutes)
	    ○ Ask questions
	    What do you mean by truth table?
	    How do you represent knowledge?
	2. **Development** (30 minutes)
	    Definition/Introduction of Proposition logic
	    Basic Facts about proposition logic
	    Different types of Proposition logic
	    Examples using Truth table
	3. **Exercise** (5 minutes)
	    Ask students to explain role of propositional logic in AI
	    Use Nearpod to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	    https://www.youtube.com/watch?v=xlUFkMKSB3Y
	
	- **Suggested reading**
	    https://www.javatpoint.com/propositional-logic-in-artificial-intelligence
	
	• **Suggested References:**
	    1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	    2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	- Discussion on expected / sample questions.
	
	- **Home Assignment:**
	    • Write a short note on the different types of propositional logic
	    • Define propositional logic with examples and discuss its truth table
	    • What is Propositional Logic?
	    • Explain the basic concept of propositional logic.
	    • How does it represent knowledge in AI?

Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss.
	• Responses acquired from Quiz on propositional logic in AI
	Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No.12	Course Name: Artificial Intelligence Topic: First order Propositional logic	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the concept of First order propositional logic b) Learn about its various types of quantifiers c) Enlist the properties of quantifiers
Teaching Aids (if any)	• PowerPoint Presentation
Teaching Development	1. **Introduction** (5 minutes) o Ask questions What do you mean by propositional logic? What are the limitations of Propositional logic ? 2. **Development** (30 minutes) - Definition/Introduction of First order propositional logic - Discuss the limitations of Propositional logic - Different types of Quantifiers - Enlist the properties of quantifiers 3. **Exercise** (5 minutes) Ask students to explain the FOPL and limitations of PL Use Nearpod to collect responses and discuss the answers.
Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings - **Suggested Video Lecture** https://www.youtube.com/watch?v=qVyX7Xwi45I - Discussion on expected / sample questions. - **Suggested reading** https://www.javatpoint.com/first-order-logic-in-artificial-intelligence - **Suggested References**: 1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig 2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson - **Home Assignment:** • Write a short note on the different types of quantifiers • Define First order propositional logic with examples • Explain the basic concept of FOL. • How does it differ from Propositional Logic in terms of expressive power?

Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss.
	• Responses acquired from Near Pod Quiz on FOPL
	Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No.13	Course Name: Artificial Intelligence Topic: Conjunctive Normal Form	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the concept of Conjunctive Normal Form b) Learn about its algorithm c) Convert well formed formula into Conjunctive Normal form
Teaching Aids (if any)	• PowerPoint Presentation

Teaching Development	1. **Introduction** (5 minutes)
	   o Ask questions
	   What do you mean by FOPL?
	   What is a well-formed formula?
	2. **Development** (30 minutes)
	   - Definition/Introduction of Conjunctive Normal Form
	   - Discuss the algorithm of Conjunctive Normal Form
	   - Practicing few examples
	3. **Exercise** (5 minutes)
	   Ask students to explain the Conjunctive Normal Form and discuss its algorithm
	   Use Nearpod to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	- https://www.youtube.com/watch?v=5cyocztOtq4
	
	- **Suggested reading**
	   https://www.geeksforgeeks.org/normal-and-principle-forms/
	
	- **Suggested References**:
	   1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	   2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	Discussion on expected / sample questions.
	
	- **Home Assignment:**
	• Write a short note on Conjunctive Normal form
	• What is Conjunctive Normal Form (CNF)?
	• Explain the definition of CNF in propositional logic.
	• What is the structure of a formula in CNF?

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Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss.
	• Responses acquired from Quiz on Conjunctive Normal Form
	Spend **5 minutes** to evaluate student assimilation of the lesson contents

Lesson Plan No.14	Course Name: Artificial Intelligence Topic: Disjunctive Normal Form	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the concept of Disjunctive Normal Form b) Learn about its algorithm c) Convert well-formed formula into Disjunctive Normal form
Teaching Aids (if any)	• PowerPoint Presentation

Teaching Development	1. **Introduction** (5 minutes)
	    ○ Ask questions
	    What do you mean by FOPL?
	    What is a well-formed formula?
	    What is CNF?
	2. **Development** (30 minutes)
	    - Definition/Introduction of Disjunctive Normal Form
	    - Discuss the algorithm of Disjunctive Normal Form
	    - Practising few examples
	3. **Exercise** (5 minutes)
	    Ask students to explain the Disjunctive Normal Form and discuss its algorithm
	    Use Nearpod to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	    https://www.youtube.com/watch?v=5cyocztOtq4
	
	- **Suggested reading**
	    https://www.geeksforgeeks.org/normal-and-principle-forms/
	
	- **Suggested References**:
	    1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	    2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	
	Discussion on expected / sample questions.
	- **Home Assignment:**
	• Write a short note on Disjunctive Normal form
	• What is Disjunctive Normal Form (DNF)?
	• Explain the definition of DNF in propositional logic.
	• What is the structure of a formula in DNF?

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| Evaluation | • Reflective Questions (What, why, Who?). Allow students to answer and discuss.
• Responses acquired from Quiz on Disjunctive Normal form
Spend **5 minutes** to evaluate student assimilation of the lesson contents |
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Lesson Plan No.15	Course Name: Artificial Intelligence Topic: Prenex Normal Form	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the concept of Prenex Normal Form b) Learn about its algorithm c) Convert FOPL into Prenex Normal form
Teaching Aids (if any)	• PowerPoint Presentation

Teaching Development	1. **Introduction** (5 minutes)
	  o Ask questions
	  What do you mean by FOPL? What is a well-formed formula? What is CNF & DNF?
	2. **Development** (30 minutes)
	  - Definition/Introduction of Prenex Normal Form
	  - Discuss the algorithm of Prenex Normal Form
	  - Practising few examples
	3. **Exercise** (5 minutes)
	  Ask students to explain the Prenex Normal Form and discuss its algorithm
	  Use Nearpod to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings - **Suggested Video Lecture** - https://www.youtube.com/watch?v=ca7su2T1vrA - **Suggested reading** https://www.csd.uwo.ca/~lkari/prenex.pdf - **Suggested References:** 1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig 2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson Discussion on expected / sample questions. - **Home Assignment:** • Write a short note on Prenex Normal form • What is Prenex Normal Form (PNF)? • Explain the definition of PNF in first-order logic. • What is the characteristic structure of a formula in PNF?

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Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss. • Responses acquired from Quiz on Prenex Normal form Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No.16	Course Name: Artificial Intelligence Topic: Resolution Method in AI	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the concept of Resolution Method in AI b) Learn about its algorithm
Teaching Aids (if any)	• PowerPoint Presentation

Teaching Development	1. **Introduction** (5 minutes)
	   o Ask questions
	   What do you mean by FOPL?
	   What is a well-formed formula?
	2. **Development** (30 minutes)
	   - Definition/Introduction of Resolution Method
	   - Discuss the algorithm of Resolution Method
	   - Practicing few examples
	3. **Exercise** (5 minutes)
	   Ask students to explain the Resolution Method and discuss its algorithm
	   Use Nearpod to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	-
	- **Suggested Video Lecture**
	- https://nptel.ac.in/courses/106/106/106106140/
	
	- **Suggested reading**
	  https://www.geeksforgeeks.org/resolution-algorithm-in-artificial-intelligence/
	
	- **Suggested References**:
	  1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	  2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	  Discussion on expected / sample questions.
	
	- **Home Assignment:**
	• Write a short note on Resolution Method and its algorithm.
	• What is the Resolution Method in AI?
	• What are the key steps involved in applying the Resolution Method?

Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss. • Responses acquired from Quiz on Resolution method Spend **5 minutes** to evaluate student assimilation of the lesson contents

Lesson Plan No.17	Course Name: Artificial Intelligence Topic: Unification in AI	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the concept of Unification in AI b) Learn about its algorithm
Teaching Aids (if any)	• PowerPoint Presentation

Teaching Development	1. **Introduction** (5 minutes)
	 o Ask questions
	   What do you mean by FOPL?
	   What is a well-formed formula?
	2. **Development** (30 minutes)
	  - Definition/Introduction of Unification
	  - Discuss the algorithm of Unification
	  - Practising few examples
	3. **Exercise** (5 minutes)
	   Ask students to explain the Unification and discuss its algorithm
	   Use Nearpod to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	  https://www.youtube.com/watch?v=zI3mHcl-kxQ
	
	- **Suggested reading**
	  https://www.javatpoint.com/ai-unification-in-first-order-logic
	- **Suggested References**:
	   1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	   2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	
	- Discussion on expected / sample questions.
	
	- **Home Assignment:**
	  • Write a short note on Unification and its algorithm.
	  • What is Unification?
	  • Explain the core concept of unification in the context of first-order logic.
	  • How does it involve finding substitutions for variables to make two expressions identical?

Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss. • Responses acquired from Quiz on Unification Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No.18	Course Name: Artificial Intelligence Topic: Inference Mechanism	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the role of inference in AI b) Learn about the different rules of Inference
Teaching Aids (if any)	• PowerPoint Presentation
Teaching Development	1. **Introduction** (5 minutes) Ask questions What do you mean by truth table? What are the different terminologies used in inference rules? 2. **Development** (30 minutes) Definition/Introduction of Resolution Method Resolution Method Steps to convert FOL into Resolution graph 3. **Exercise** (5 minutes) Ask students to explain role of Resolution Method in AI Use Nearpod to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	 https://www.youtube.com/watch?v=sdx6E2w9Td0
	
	- **Suggested reading**
	 https://www.geeksforgeeks.org/inference-in-ai/
	
	- **Suggested References**:
	  1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	  2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	
	- Discussion on expected / sample questions.
	
	- **Home Assignment:**
	• Write a short note on the inference rules with examples
	• What is Inference in AI?
	• Define deductive inference.
	• Explain how it derives specific conclusions from general principles.
	• Provide examples of deductive inference rules
	• Explain the concept of inference in the context of AI.

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Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss.
	• Responses acquired from Quiz on Inference Rules
	Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No.19	Course Name: Artificial Intelligence Topic: Semantic Networks	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the concept of Semantic Networks b) Learn about the different types of Semantic Networks
Teaching Aids (if any)	• PowerPoint Presentation

Teaching Development	1. **Introduction** (5 minutes)
	    Ask questions
	      What do you mean by Networks?
	      What is Semantics?
	2. **Development** (30 minutes)
	    - Definition/Introduction of Semantic Networks
	    - Construction of Semantic Networks
	    - Advantages & Disadvantages of Semantic Networks
	    - Various types of Semantic Networks
	3. **Exercise** (5 minutes)
	    Ask students to explain role of Semantic Networks in AI
	    Use Nearpod to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	    https://www.youtube.com/watch?v=RTmafl2rzEw
	
	  - **Suggested reading**
	    https://www.geeksforgeeks.org/semantic-networks-in-artificial-intelligence/
	
	- **Suggested References**:
	    1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	    2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	
	Discussion on expected / sample questions.
	
	- **Home Assignment:**
	• What is a Semantic Network?
	• Explain the basic concept of a semantic network as a knowledge representation technique in AI.
	• How does it use nodes and links to represent concepts and their relationships?
	• How do semantic networks facilitate knowledge representation and reasoning?

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Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss. • Responses acquired from Quiz on Semantic Networks Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No.20	Course Name: Artificial Intelligence Topic: Frames in AI	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the concept of Frames. b) Create Frames corresponding to any given semantic net. c) Analyse the significance of Frames in AI
Teaching Aids (if any)	a) PowerPoint Presentation
Teaching Development	1. Introduction (5 minutes) Ask questions - What is an entity? - What are attributes? - How would you describe an entity with various attributes? 2. Development (30 minutes) - Definition/Introduction of Frames in AI - Creation of Frames with examples - Advantages & disadvantages of Frame representation 3. Exercise (5 minutes) - Ask students to create Frames for a given entity - Use Nearpod tool to collect responses and discuss the answers.
Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings - **Suggested Video Lecture** https://www.youtube.com/watch?v=nXJ_2uGWM-M - **Suggested reading** https://www.geeksforgeeks.org/frames-in-ai-knowledge-representation-and-inheritance/ - **Suggested References**: 1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig 2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson Discussion on expected questions. - **Home Assignment:** - What are Frames in AI? - Explain the concept of frames as a knowledge representation technique in AI. - How do they represent stereotypical situations or objects with their attributes and relationships?

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Evaluation	1. Reflective Questions (What, why, Who?). Allow students to answer and discuss.
	2. Responses acquired from Quiz on Frame representation.
	Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No. 21	Course Name: Artificial Intelligence Topic: Scripts in AI	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the concept of scripts b) Learn about the different components of Scripts c) Identify is advantages and disadvantages
Teaching Aids (if any)	• PowerPoint Presentation

Teaching Development	1. **Introduction** (5 minutes)
	Ask questions
	   What do you mean by Networks? What
	   is Semantics?
	   What is a script?
	2. **Development** (30 minutes)
	   - Definition/Introduction of Scripts
	   - Discussion on Components of Scripts
	   - Analyse the Advantages & Disadvantages of Scripts
	3. **Exercise** (5 minutes)
	   - Ask students to explain role of Scripts in AI
	   Use Nearpod to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	-
	- **Suggested Video Lecture**
	   https://nptel.ac.in/courses/106/106/106106140/
	
	- **Suggested reading**
	   https://www.geeksforgeeks.org/script-theory-in-artificial-intelligence/
	
	- **Suggested References**:
	   1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	   2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	
	- Discussion on expected / sample questions.
	
	- **Home Assignment:**
	   - Write a short note on the Scripts with examples
	   - What are Scripts in AI?
	   - Explain the concept of scripts as a knowledge representation technique in AI.
	   - How do they represent stereotypical sequences of events or actions in a particular context?
	   - What are entry conditions, and how do they trigger the execution of a script?
	   - What are roles in a script, and how do they define the expected behavior of different participants?

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Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss. • Responses acquired from Quiz on Scripts in AI Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No. 22	Course Name: Artificial Intelligence Topic: Reasoning	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the concept of Reasoning b) Learn about the different types of reasoning
Teaching Aids (if any)	• PowerPoint Presentation

Teaching Development	1. **Introduction** (5 minutes)
	   Ask questions
	       What do you mean by reasoning?
	2. **Development** (30 minutes)
	    - Definition/Introduction of Reasoning
	    - Discussion on types of Reasoning
	    - Discuss few examples
	3. **Exercise** (5 minutes)
	   - Ask students to explain role of Reasoning in AI
	    Use Nearpod to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	    https://onlinecourses.nptel.ac.in/noc21_cs79/preview
	
	- **Suggested reading**
	    https://www.javatpoint.com/reasoning-in-artificial-intelligence
	
	- **Suggested References**:
	   1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	   2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	
	- Discussion on expected / sample questions.
	
	- **Home Assignment:**
	    - Write a short note on the Reasoning with examples
	    - What is Reasoning in AI?
	    - Explain the concept of reasoning in the context of AI.
	    - How does it enable AI systems to draw conclusions, make predictions, and solve problems?

Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss. • Responses acquired from Quiz on Reasoning Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No. 23	Course Name: Artificial Intelligence Topic: Uncertainty in AI	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the concept of Uncertainty in AI b) Learn about the Sources of uncertainty c) Comparison on Procedural and Declarative knowledge
Teaching Aids (if any)	• PowerPoint Presentation

Teaching Development	1. **Introduction** (5 minutes)
	  o Ask questions
	  What do you mean by uncertainty?
	  How do you define procedural and non-procedural ?
	2. **Development** (30 minutes)
	  - Definition/Introduction of uncertainty in AI
	  - Discussion on Problems caused with data
	  - Description on Sources of uncertainty
	  - Comparison on Procedural and Declarative knowledge
	3. **Exercise** (5 minutes)
	  Ask students to explain role of Uncertainty in AI
	  Use Nearpod to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- Suggested Video Lecture
	- **https://www.youtube.com/watch?v=yE8oCPmKX0I**
	
	- **Suggested reading**
	https://intellipaat.com/blog/what-is-uncertainty-in-artificial-intelligence/
	
	- **Suggested References**:
	  1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	  2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	
	- Discussion on expected / sample questions.
	
	- **Home Assignments**
	• Write a short note on the Uncertainty and its sources
	• Explain the comparison between Procedural and Declarative knowledge
	• What is Uncertainty in AI?

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	• Explain the concept of uncertainty in the context of AI.
	• How does it arise in real-world scenarios and impact AI systems?
Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss. • Responses acquired from Quiz on Uncertainty Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No. 24	Course Name: Artificial Intelligence Topic: Conceptual dependency in AI	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the concept of Conceptual dependency in AI b) Learn about the conceptual categories c) Articulate the various primitive acts in CD theory
Teaching Aids (if any)	• PowerPoint Presentation

Teaching Development	1. **Introduction** (5 minutes)
	   o Ask questions
	   How do you form a sentence?
	   What kind of structure is preferred to represent a complete sentence?
	2. **Development** (30 minutes)
	  - Definition/Introduction of Conceptual dependency in AI
	  - Discussion on conceptual categories
	  - Description on various primitive acts in CD theory
	3 **Exercise** (5 minutes)
	   Ask students to explain role of Conceptual dependency y in AI Use Nearpod to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	- https://www.youtube.com/watch?v=SXjDINytAJo
	
	- **Suggested reading**
	  https://www.javatpoint.com/conceptual-dependency-in-ai
	
	- **Suggested References**:
	  1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	  2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	
	- Discussion on expected / sample questions.
	-
	- **Home Assignments**
	• Write a short note on the Conceptual dependency
	• Explain the primitive acts in CD theory
	• What is Conceptual Dependency (CD)?
	• Define CD as a knowledge representation model that aims to represent the meaning of natural language sentences
	• Explain its focus on capturing the underlying conceptual structure

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Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss.
	• Responses acquired from Quiz on Conceptual dependency
	Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No. 25	Course Name: Artificial Intelligence Topic: Hill climbing	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the method of Hill climbing b) Capture the types and algorithm of Hill climbing
Teaching Aids (if any)	a) PowerPoint Presentation

Teaching Development	1. **Introduction** (5 minutes)
	   Ask questions
	   - What are Heuristic searching techniques?
	   - What is the difference between the informed and uninformed search?
	2. **Development** (30 minutes)
	   - Definition/Introduction of Hill climbing
	   - Features of Hill climbing
	   - Types of Hill climbing
	   - Problems in Hill climbing algorithm
	3. **Exercise** (5 minutes)
	   - Ask students to enlist and briefly describe the various searching techniques.
	   - Use Nearpod tool to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	  https://www.youtube.com/watch?v=ZOvRZ7UJMjk
	  https://www.youtube.com/watch?v=Fs0UgJzEjwA
	
	- **Suggested reading**
	- https://www.geeksforgeeks.org/introduction-hill-climbing-artificial-intelligence/
	
	- **Suggested References**:
	  1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	  2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	
	  Discussion on expected questions.
	
	- **Home Assignment:**
	  1. Discuss the Hill climbing technique
	  2. Discuss the different types of Hill climbing algorithm
	  3. What is the Hill Climbing Algorithm?
	  4. Explain the core concept of the Hill Climbing algorithm as a local search algorithm used for optimization problems.

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	5. Describe how it iteratively moves towards a better solution by exploring the immediate neighborhood of the current state.
Evaluation	1. Reflective Questions (What, why, Who?). Allow students to answer and discuss. 2. Responses acquired from Quiz on Hill climbing Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No. 26	Course Name: Artificial Intelligence Topic: Searching Techniques-Best First Search	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to:
	  a) Understand the method of Best First search
	  b) Capture the algorithm of BFS

Teaching Aids (if any)	a) PowerPoint Presentation

Teaching Development	1. **Introduction** (5 minutes)
	    Ask questions
	      a. What are Heuristic searching techniques?
	      b. What is the difference between the informed and uninformed search?
	2. **Development** (30 minutes)
	    Definition/Introduction of Best First search
	    Algorithm used in Best First search
	    Solving sample questions
	    Advantages & disadvantages of BFS
	3. **Exercise** (5 minutes)
	  - Ask students to enlist and briefly describe the various searching techniques.
	  - Use Nearpod tool to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	   https://www.youtube.com/watch?v=6hmIKIWBVSI
	
	- **Suggested reading**
	   https://www.javatpoint.com/best-first-search-algorithm-in-artificial-intelligence
	
	- **Suggested References**:
	   1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	   2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	
	- Discussion on expected questions.
	
	- **Home Assignment:**
	   1. Discuss the Best First Search algorithm
	   2. Explain the points of difference between Best First Search and Breadth First search
	   3. What is Best-First Search (BFS)?
	   4. Explain the core concept of BFS as an informed search algorithm

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	that uses a heuristic function to guide the search process.
Evaluation	1. Reflective Questions (What, why, Who?). Allow students to answer and discuss. 2. Responses acquired from Quiz on Searching Techniques Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No. 27	Course Name: Artificial Intelligence Topic: A* algorithm	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to:
	  a) Understand the method of A* algorithm
	  b) Capture the algorithm of A*

Teaching Aids (if any)	• PowerPoint Presentation

Teaching Development	1. **Introduction** (5 minutes)
	   Ask questions
	  - What do you understand by Heuristic search?
	  - What is the difference between the informed and uninformed search?
	  - What is the importance of Best First search
	2 **Development** (30 minutes)
	   Definition/Introduction of A* algorithm
	   Algorithm used in A*
	   Solving sample questions
	   Advantages & disadvantages of A*
	3 **Exercise** (5 minutes)
	  - Ask students to enlist and briefly describe the method of A*
	  - Use Nearpod tool to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	- https://www.youtube.com/watch?v=yMcZvZayJUA
	
	- **Suggested reading**
	- https://www.geeksforgeeks.org/a-search-algorithm/
	
	- **Suggested References**:
	  1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	  2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	
	- Discussion on expected questions.
	-
	- **Home Assignment:**
	  1. Discuss the A* algorithm
	  2. Explain the points of difference between Best First Search and A*
	  3. What is the A* Search Algorithm?
	  4. Discuss Key Concepts in A* Search

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Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss. • Responses acquired from Quiz on A* algorithm Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No. 28	Course Name: Artificial Intelligence Topic: AO* algorithm	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the method of AO* algorithm b) Capture the algorithm of AO*
Teaching Aids (if any)	• PowerPoint Presentation
Teaching Development	1. **Introduction** (5 minutes) Ask questions - What is the importance of Best First search - What is the need of A* algorithm? 2. **Development** (30 minutes) • Definition/Introduction of AO* algorithm • Algorithm used in AO* • Solving sample questions • Features of AO* search 3. **Exercise** (5 minutes) - Ask students to enlist and briefly describe the method of AO* - Use Nearpod tool to collect responses and discuss the answers.
Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings - **Suggested Video Lecture** - https://www.youtube.com/watch?v=6CoX9GmDRhU - **Suggested reading** https://www.geeksforgeeks.org/ao-algorithm-artificial-intelligence/ **Suggested References**: 1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig 2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson - Discussion on expected questions. - **Home Assignment:** • Discuss the AO* algorithm • Explain the points of difference between A* and AO* • Describe the structure of an AND-OR graph, emphasizing the distinction between AND nodes and OR nodes. • Explain how AND nodes represent sub-goals that must all be achieved, while OR nodes represent alternative paths to achieve a goal.

Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss. • Responses acquired from Quiz on AO* algorithm Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No. 29	Course Name: Artificial Intelligence Topic: Constraint Satisfaction problem	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand Constraint Satisfaction Problem b) Enlist the popular CSP and the techniques of dealing with them.
Teaching Aids (if any)	a) PowerPoint Presentation
Teaching Development	1. **Introduction** (5 minutes) Ask questions - What is n-Queen Problem? - What do you mean by Sudoku? - How do you solve a Crossword puzzle? 2. **Development** (30 minutes) - Definition/Introduction of Constraint Satisfaction Problem - Algorithm used in Constraint Satisfaction Problem - Discussion on popular Constraint Satisfaction Problems 3. **Exercise** (5 minutes) - Ask students to enlist and briefly describe the various Constraint Satisfaction Problem - Use Nearpod tool to collect responses and discuss the answers.
Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings - **Suggested Video Lecture** **https://www.youtube.com/watch?v=il20Q5tXp-A** 1. **Suggested reading** https://www.geeksforgeeks.org/constraint-satisfaction-problems-csp-in-artificial-intelligence/ - **Suggested References**: 1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig 2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson - Discussion on expected questions. - **Home Assignment:** 1. Write a short note Constraint Satisfaction Problem 2. Explain the popular Constraint Satisfaction Problem and the techniques of dealing with them 3. What is a Constraint Satisfaction Problem (CSP)? 4. Define a CSP as a problem where you have a set of variables, each with a domain of possible values, and a set of constraints that restrict the combinations of values 5. What are constraints in a CSP?

Evaluation	1. Reflective Questions (What, why, Who?). Allow students to answer and discuss.
	2. Responses acquired from Quiz on Constraint Satisfaction Problems
	Spend **5 minutes** to evaluate student assimilation of the lesson contents

Lesson Plan No.30	Course Name: Artificial Intelligence Topic: Multi Agent Systems	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the concept of Multi Agent Systems. b) Learn about the benefits of MAS c) Conclude the MAS challenges. d) Analyse the applications of MAS
Teaching Aids (if any)	a) PowerPoint Presentation
Teaching Development	1. **Introduction (5 minutes)** Ask questions - What is an Agent? - What are Rational Agents? - What are expert systems? 2. **Development (30 minutes)** - Definition/Introduction to MAS - Advantages of MAS - Discussion on its challenges - Discuss the applications of MAS. 3. **Exercise (5 minutes)** - Ask students to briefly describe the importance, applications and issues of MAS. - Use Google form to collect responses and discuss the answers.
Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings - **Suggested Video Lecture** https://www.youtube.com/watch?v=8GOQjDVdMJM - **Suggested reading** https://www.geeksforgeeks.org/what-is-a-multi-agent-system-in-ai/ - Discussion on expected questions. - **Suggested References**: 1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig 2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson - **Home Assignment:** • What are Multi-Agent Systems (MAS)? • Define MAS as a system composed of multiple interacting intelligent agents. • Explain that these agents can be software programs, robots, or other autonomous entities.

Evaluation	1. Reflective Questions (What, why, Who?). Allow students to answer and discuss.
	2. Responses acquired from Google form on Multi Agent Systems
	Spend **5 minutes** to evaluate student assimilation of the lesson contents

Lesson Plan No.31	Course Name: Artificial Intelligence Topic: Multi Agent Systems Organization	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the structure of MAS b) Learn about the different types of structure in MAS
Teaching Aids (if any)	• PowerPoint Presentation

Teaching Development	1. **Introduction (5 minutes)**
	Ask questions
	    - What is MAS?
	    - What is its significance?
	    - How will the agents communicate?
	2. **Development (30 minutes)**
	  - Definition of the MAS organisation
	  - Discussion on each of the type of structure:
	    • Hierarchical
	    • Holonic
	    • Flat
	    • Coalition
	    • Team
	    • Matrix
	    • Congregation
	3. **Exercise (5 minutes)**
	- Ask students to briefly describe the various structures of MAS.
	- Use Google form to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	  https://www.coursera.org/lecture/modeling-simulation-natural-processes/multi-agent-systems-kAKyC
	
	- **Suggested reading**
	  https://www.geeksforgeeks.org/what-is-a-multi-agent-system-in-ai/
	
	- **Suggested References**:
	  1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	  2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	
	- Discussion on expected questions.
	
	- **Homework**
	- What are Multi-Agent Systems (MAS)?
	- Define MAS as a system composed of multiple interacting intelligent

	agents.
	- Explain that these agents can be software programs, robots, or other autonomous entities.
Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss. • Responses acquired from Google form on MAS Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No. 32	Course Name: Artificial Intelligence Topic: Multi Agent Systems communication	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the concept of Multi Agent Systems communication. b) Comprehend the various approaches used for communication in MAS
Teaching Aids (if any)	a) PowerPoint Presentation
Teaching Development	1. **Introduction (5 minutes)** Ask questions - What is an Agent? - What are Rational Agents? - What are expert systems? 2. **Development (30 minutes)** - Definition/Introduction to MAS - Different approaches used in MAS communication. - Discussions on Agent communicate Language and its categories. 3. **Exercise (5 minutes)** - Ask students to enlist different approaches for communication. - Use Google form to collect responses and discuss the answers.
Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings - **Suggested Video Lecture** https://www.coursera.org/lecture/modeling-simulation-natural-processes/multi-agent-systems-kAKyC - **Suggested reading** https://www.geeksforgeeks.org/communication-in-multi-agent-environment-in-ai/ - **Suggested References**: 1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig 2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson - Discussion on expected questions. - **Homework** • What is Agent Communication in Multi-Agent Systems? • Define agent communication as the process by which agents exchange information, coordinate actions, and negotiate solutions in a multi-agent system. • Explain why communication is crucial for collaboration,

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	cooperation, and achieving collective goals in a multi-agent environment.
	• Why is Communication Important in MAS?
	• How does communication enable agents to coordinate their actions and avoid conflicts?
Evaluation	1. Reflective Questions (What, why, Who?). Allow students to answer and discuss.
	2. Responses acquired from Google form on MAS and the approaches used in communication.
	Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No. 33	Course Name: Artificial Intelligence Topic: Semantic Networks	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the Semantic Networks b) Learn about the different types of structure in MAS
Teaching Aids (if any)	• PowerPoint Presentation

Teaching Development	1. **Introduction (5 minutes)**
	   Ask questions
	      - What is Semantics?
	      - What do you mean by networks?
	2. **Development (30 minutes)**
	      - Introduction of Semantic Networks
	      - Construction of Networks
	      - Discussion on various types of Semantic Networks
	      - Advantages & Disadvantages
	      - Few Examples
	3. **Exercise (5 minutes)**
	   Ask students to briefly describe the various types of semantic Networks
	   Use Google form to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	  https://www.coursera.org/lecture/modeling-simulation-natural-processes/multi-agent-systems-kAKyC
	
	- **Suggested reading**
	  https://www.geeksforgeeks.org/semantic-networks-in-artificial-intelligence/
	
	- **Suggested References**:
	  1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	  2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	
	- Discussion on expected questions.
	
	- **Homework:**
	• What are Semantic Networks?

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	• Define semantic networks as a knowledge representation technique in AI that uses a graph-like structure to represent relationships between concepts. • Explain that nodes represent concepts or objects, and links (edges) represent relationships between these concepts. • What do nodes represent in a semantic network?
Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss. • Responses acquired from Google form on Semantic web Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No. 34	Course Name: Artificial Intelligence Topic: Genetic Algorithm	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the concept of Genetic Algorithm b) Perceive and enlist the important terms used in Genetic Algorithm
Teaching Aids (if any)	• PowerPoint Presentation

Teaching Development	1. **Introduction (5 minutes)**
	Ask questions
	- What do you mean by Genetic?
	- How would you mean by chromosomes?
	2. **Development (30 minutes)**
	- Definition/Introduction of Genetic Algorithm
	- Discussion on following terms:
	 • Individual
	 • Population
	 • Phases of GA
	  a. Initial population
	  b. Fitness function
	  c. Selection
	  d. Crossover
	  e. Mutation
	3. **Exercise (5 minutes)**
	- Ask students to explain the terms associated with Genetic Algorithm Use Nearpod tool to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings - **Suggested Video Lecture** https://www.youtube.com/watch?v=Z_8MpZeMdD4 https://www.youtube.com/watch?v=ep3hLUDM7uA **Suggested reading** https://www.geeksforgeeks.org/genetic-algorithms/ - **Suggested References**: 1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig 2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson - Discussion on expected questions. - **Homework:** - What is a population in the context of GAs? - Explain that it represents a set of candidate solutions to the

	problem.
	- Define GA as an evolutionary computation technique inspired by natural selection and genetics.
	- Explain how it iteratively improves a population of candidate solutions by applying genetic operators (crossover and mutation) to evolve better solutions over generations.
Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss.
	• Responses acquired from Quiz on Genetic Algorithm
	Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No. 35	Course Name: Artificial Intelligence Topic: Genetic Algorithm Cycle	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the concept of Genetic Algorithm Cycle b) Perceive the algorithm used in Genetic Algorithm Cycle c) Evaluate the Fitness function
Teaching Aids (if any)	• PowerPoint Presentation
Teaching Development	1. **Introduction (5 minutes)** Ask questions - What do u mean by Genetics? - How would you mean by chromosomes? 2. **Development (30 minutes)** - Definition/Introduction of Genetic Algorithm Cycle - Discussion on Genetic algorithm - Explanation of the GA flowchart - Steps to evaluate the fitness function 3. **Exercise (5 minutes)** - Ask students to explain the GA cycle and steps to find the fitness function - Use Nearpod tool to collect responses and discuss the answers.
Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings - **Suggested Video Lecture** https://www.youtube.com/watch?v=Z_8MpZeMdD4 https://www.youtube.com/watch?v=ep3hLUDM7uA **Suggested reading** - https://www.geeksforgeeks.org/genetic-algorithms/ - **Suggested References**: 1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig 2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson - Discussion on expected questions. - **Homework** • What happens during the initialization phase? • Describe how an initial population of candidate solutions is generated. • Discuss common initialization methods • What happens during the initialization phase?

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	• Describe how an initial population of candidate solutions is generated. • Discuss common initialization methods
Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss. • Responses acquired from Quiz on Genetic Algorithm Cycle Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No. 36	Course Name: Artificial Intelligence Topic: Crossover in Genetic Algorithm	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to:
	   a) Understand the concept of Crossover in GA
	   b) Learn and enlist the various types of crossovers

Teaching Aids (if any)	• PowerPoint Presentation

Teaching Development	1. **Introduction (5 minutes)**
	   Ask questions
	   - What do u mean by Genetics?
	   - How would you mean by chromosomes?
	2. **Development (30 minutes)**
	   - Definition/Introduction of Crossover
	   - Discussion on Different types of crossover
	       - Single point crossover
	       - Multipoint crossover
	       - Uniform crossover
	       - Order based crossover
	       - Mass crossover
	3. **Exercise (5 minutes)**
	   - Ask students to explain the crossover and enlist its types
	   - Use Nearpod tool to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	   https://nptel.ac.in/courses/106/105/106105173/
	
	- **Suggested reading**
	- https://www.geeksforgeeks.org/crossover-in-genetic-algorithm/
	
	- **Suggested References**:
	   1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	   2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	
	- Discussion on expected questions.
	
	- **Homework**
	   • What is Crossover in the context of Genetic Algorithms?
	   • Why is Crossover Important in Genetic Algorithms?
	   • Explain how one-point crossover works
	   • Explain how two-point crossover works

Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss.
	• Responses acquired from Nearpod Quiz on crossover
	Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No. 37	Course Name: Artificial Intelligence Topic: Mutation in Genetic Algorithm	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the concept of Mutation b) Perceive and enlist the types of mutation
Teaching Aids (if any)	a) PowerPoint Presentation

Teaching Development	1. **Introduction (5 minutes)**
	   Ask questions
	   - What do you mean by Genetic Algorithm?
	   - What do you mean by crossover?
	2. **Development (30 minutes)**
	   - Definition/Introduction of Mutation in Genetic Algorithm
	   - Discussion on types of Mutation with examples
	3. **Exercise (5 minutes)**
	   - Ask students to solve and implement a question using Mutation
	   - Use Nearpod tool to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	  https://www.youtube.com/watch?v=UZjAcysZyj8
	
	- **Suggested reading**
	  https://www.tutorialspoint.com/genetic_algorithms/genetic_algorithms_mutation.htm
	
	- **Suggested References**:
	  1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	  2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	
	- Discussion on expected questions.
	  Homework:
	  • What is Mutation in Genetic Algorithms?
	  • Define mutation as a genetic operator that introduces random changes to the offspring's genetic material.
	  • Explain that it mimics the process of random mutations in biological organisms.
	  • Why is Mutation Important in Genetic Algorithms?

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Evaluation	1. Reflective Questions (What, why, Who?). Allow students to answer and discuss.
	2. Responses acquired from Quiz on Mutation in Genetic Algorithm
	Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No. 38	Course Name: Artificial Intelligence Topic: Survivor Selection Policy in Genetic Algorithm	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: a) Understand the concept of Survivor Selection Policy in Genetic Algorithm b) Identify the two criteria for selecting the survivors
Teaching Aids (if any)	a) PowerPoint Presentation
Teaching Development	1. **Introduction (5 minutes)** Ask questions - Can you Suggest a technique of maintaining a balance of population? - Can you Suggest parameters / criteria for selection? 2. **Development (30 minutes)** - Definition/Introduction of Survivor Selection Policy in Genetic Algorithm - Different criteria for selection policy - Discussion of each criterion with examples 3. **Exercise (5 minutes)** - Ask students to explain the concept of survivor selection policy - Ask students to enlist the parameters suggested for selection policy - Use Google Form to collect responses and discuss the answers.
Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings - **Suggested reading** https://www.tutorialspoint.com/genetic_algorithms/genetic_algorithms_survivor_selection.htm - **Suggested References**: 1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig 2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson - Discussion on expected questions. - **Homework** • What is Survivor Selection in Genetic Algorithms? • Explain that it's crucial for maintaining diversity, preventing premature convergence, and guiding the evolutionary process. • Why is Survivor Selection Important? • How does survivor selection influence the direction of the search by favoring individuals with higher fitness and potentially

	discarding less fit individuals?
Evaluation	1. Reflective Questions (What, why, Who?). Allow students to answer and discuss. 2. Responses acquired from Google Form on Survivor Selection Policy in Genetic Algorithm Spend **5 minutes** to evaluate student assimilation of the lesson contents

Lesson Plan No. 39	Course Name: Artificial Intelligence Topic: Natural Language Processing	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to:
	   a) Understand the concept of NLP
	   b) Identify the different components of NLP
	   c) Analyse the significance of NLP in AI

Teaching Aids (if any)	a) PowerPoint Presentation

Teaching Development	1. **Introduction (5 minutes)**
	   Ask questions
	   - What is the full form of NLP?
	   - Why is it required?
	   - Identify the application of NLP
	2. **Development (30 minutes)**
	   - Definition/Introduction of Natural Language Processing
	   - Different components of Natural Language Processing
	   - Difficulties in NLP
	3. **Exercise (5 minutes)**
	   - Ask students to explain the components of NLP
	   - Use Nearpod tool to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	   https://nptel.ac.in/courses/106/101/106101007/
	
	- **Suggested reading**
	   https://www.geeksforgeeks.org/natural-language-processing- overview/
	
	- **Suggested References**:
	   1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	   2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	
	- Discussion on expected questions.
	
	- **Homework**
	   • What is Natural Language Processing (NLP)?
	   • Why is NLP Important?
	   • What are Key Challenges in NLP
	   • Explain the Core NLP Tasks

Evaluation	1. Reflective Questions (What, why, Who?). Allow students to answer and discuss. 2. Responses acquired from Quiz on NLP. Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Lesson Plan No. 40	Course Name: Artificial Intelligence Topic: Parsing Techniques	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to:
	  a) Understand the concept of Parsing
	  b) Articulate the importance of Parsing.
	  c) Classify different approaches used in Parsing

Teaching Aids (if any)	a) PowerPoint Presentation

Teaching Development	1. **Introduction (5 minutes)**
	  Ask questions
	  - What is context free grammar?
	  - When do you call a sentence in valid grammar state?
	  - What do you mean by semantic analysis?
	2. **Development (30 minutes)**
	  - Definition/Introduction of Parsing
	  - Discussion on classification of parsers
	  - Explanation on Top-Down parsing technique
	  - Implementation of Top-Down parsing using few examples
	3. **Exercise (5 minutes)**
	  - Ask students to explain the concept of Parsing and enlist various techniques.
	  - Use Nearpod tool to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	  https://nptel.ac.in/courses/106/101/106101007/
	
	- **Suggested reading**
	  https://intellipaat.com/blog/what-is-parsing-in-nlp/
	
	- **Suggested References**:
	  1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	  2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	
	- Discussion on expected questions.
	- **Homework**
	  • What is Parsing in NLP?
	  • Why is Parsing Important in NLP?
	  • Explain the various Parsing Techniques

Evaluation	1. Reflective Questions (What, why, Who?). Allow students to answer and discuss. 2. Responses acquired from Quiz on Parsing. Spend **5 minutes** to evaluate student assimilation of the lesson contents

Lesson Plan No.41	Course Name: Artificial Intelligence Topic: Transformational Grammar	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: • Understand the concept of Transformational Grammar • Identify its different types with examples • Analyze the significance of Transformational Grammar in NLP
Teaching Aids (if any)	• PowerPoint Presentation

Teaching Development	1. **Introduction (5 minutes)**
	Ask questions
	- What do you mean by Natural Languages?
	- What we mean by active voice and passive voice?
	2. **Development (30 minutes)**
	   • Definition/Introduction of Transformational rule
	   • Discussion on Transformational rule
	   • Its types
	3. **Exercise (5 minutes)**
	Ask students to explain the types of transformational grammar
	Use Nearpod tool to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	- https://nptel.ac.in/courses/106/106/106106049/
	
	- **Suggested reading**
	- https://www.britannica.com/topic/transformational-grammar
	
	- **Suggested References**:
	  1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	  2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	
	- Discussion on expected questions.
	
	- **Homework**
	• What is Transformational Grammar?
	• How does Transformational Grammar Work?
	• Explain Significance of Transformational Grammar

Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss. • Responses acquired from Quiz on Transformational grammar. Spend **5 minutes** to evaluate student assimilation of the lesson contents

Lesson Plan No.42	Course Name: Artificial Intelligence Topic: Transition Nets	Course No.: MCA-205

Objectives	At the end of the lesson the student shall be able to: • Understand the concept of Transition nets • Identify its different types • Analyze the significance of Transition Nets in NLP
Teaching Aids (if any)	• PowerPoint Presentation

Teaching Development	• **Introduction (5 minutes)**
	Ask questions
	• What do you mean by Natural Languages?
	• What we mean by directed graphs?
	• **Development (30 minutes)**
	    • Definition/Introduction of Transition Nets
	    • Discussion on Types of Transition Nets
	    • Examples
	• **Exercise (5 minutes)**
	• Ask students to explain the components of NLP
	• Use Nearpod tool to collect responses and discuss the answers.

Closure	- Summarize the Lesson Learning Outcomes and get affirmation from students on these. Spend **5 minutes** to wrap up and consolidate the learnings
	
	- **Suggested Video Lecture**
	https://nptel.ac.in/courses/106/105/106105158
	
	- **Suggested reading**
	https://www.geeksforgeeks.org/augmented-transition-networks-in-natural-language-processing/
	
	- **Suggested References**:
	  1. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig
	  2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson
	
	- Discussion on expected questions.
	
	- **Homework:**
	  • What are Transition Networks?
	  • Explain types of Transition Networks
	  • How are Transition Networks Used in NLP?
	  • Discuss Limitations of Transition Networks

Evaluation	• Reflective Questions (What, why, Who?). Allow students to answer and discuss. • Responses acquired from Quiz on Transition Nets Spend **5 minutes** to evaluate student assimilation of the lesson contents

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Version 1.1

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