Department of Computer Applications

Details of Lesson Plan

S.No.	Particulars	Details
1.	Course Name	Computer Organization
2.	Course Code	BCAMJ-302
3.	Academic Year	2024-25
4.	Semester	3rd
5.	Number of Lesson plans	41
6.	Faculty Assigned	Ms. Amita Khanna

Faculty Signature

Lesson Plan No. 01	Course Name: Computer Organization Topic: Introduction to Boolean Algebra	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Introduction to Boolean Algebra b. select the appropriate Introduction to Boolean Algebra for different use-case scenarios. c. illustrate different types of Introduction to Boolean Algebra with examples. d. appreciate advantages of Introduction to Boolean Algebra its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Introduction to Boolean Algebra do the students use? where is your Introduction to Boolean Algebra has been stored? do you know the location of your Introduction to Boolean Algebra? - Introduce the concept of Introduction to Boolean Algebra. Show Figure on slide. - Introduce the formal definition of Introduction to Boolean Algebra by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Introduction to Boolean Algebra –Highlight the size of the Introduction to Boolean Algebra in Computer Organization 2. **Development** (30 minutes) Introduction to Boolean Algebra - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Introduction to Boolean Algebra Models - Introduce the concepts of Introduction to Boolean Algebra with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Introduction to Boolean Algebra . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Introduction to Boolean Algebra a. Advantages of Introduction to Boolean Algebra b. Challenges in of Introduction to Boolean Algebra - Security

	- National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Introduction to Boolean Algebra. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Introduction to Boolean Algebra http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Introduction to Boolean Algebra concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Introduction to Boolean Algebra Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 02	Course Name: Computer Organization Topic: Addition and Multiplication in Boolean algebra	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Addition and Multiplication in Boolean Algebra b. select the appropriate Addition and Multiplication in Boolean Algebra for different use-case scenarios. c. illustrate different types of Addition and Multiplication in Boolean Algebra with examples. d. appreciate advantages of Addition and Multiplication in Boolean Algebra its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Addition and Multiplication in Boolean Algebra do the students use? where is your Addition and Multiplication in Boolean Algebra has been stored? do you know the location of your Addition and Multiplication in Boolean Algebra? - Introduce the concept of Addition and Multiplication in Boolean Algebra. Show Figure on slide. - Introduce the formal definition of Addition and Multiplication in Boolean Algebra by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Addition and Multiplication in Boolean Algebra –Highlight the size of the Addition and Multiplication in Boolean Algebra in Computer Organization 2. **Development** (30 minutes) Addition and Multiplication in Boolean Algebra - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Addition and Multiplication in Boolean Algebra Models - Introduce the concepts of Addition and Multiplication in Boolean Algebra with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Addition and Multiplication in Boolean Algebra .

	- Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Addition and Multiplication in Boolean Algebra a. Advantages of Addition and Multiplication in Boolean Algebra b. Challenges in of Addition and Multiplication in Boolean Algebra - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Addition and Multiplication in Boolean Algebra. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Addition and Multiplication in Boolean Algebra http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Addition and Multiplication in Boolean Algebra concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Addition and Multiplication in Boolean Algebra Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 03	Course Name: Computer Organization Topic: Logic gates and Truthtables	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Logic gates and its Truth tables b. select the appropriate Logic gates and its Truth tables for different use-case scenarios. c. illustrate different types of Logic gates and its Truth tables with examples. d. appreciate advantages of Logic gates and its Truth tables its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Logic gates and its Truth tables do the students use? where is your Logic gates and its Truth tables has been stored? do you know the location of your Logic gates and its Truth tables? - Introduce the concept of Logic gates and its Truth tables. Show Figure on slide. - Introduce the formal definition of Logic gates and its Truth tables by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Logic gates and its Truth tables –Highlight the size of the Logic gates and its Truth tables in Computer Organization 2. **Development** (30 minutes) Logic gates and its Truth tables - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Logic gates and its Truth tables Models - Introduce the concepts of Logic gates and its Truth tables with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Logic gates and its Truth tables . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Logic gates and its Truth tables a. Advantages of Logic gates and its Truth tables b. Challenges in of Logic gates and its Truth tables - Security

	- National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Logic gates and its Truth tables. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Logic gates and its Truth tables http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Logic gates and its Truth tables concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Logic gates and its Truth tables Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 04	Course Name: Computer Organization Topic: Boolean Rules and Laws	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Boolean Rules and Laws b. select the appropriate Boolean Rules and Laws for different use-case scenarios. c. illustrate different types of Boolean Rules and Laws with examples. d. appreciate advantages of Boolean Rules and Laws its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Boolean Rules and Laws do the students use? where is your Boolean Rules and Laws has been stored? do you know the location of your Boolean Rules and Laws? - Introduce the concept of Boolean Rules and Laws. Show Figure on slide. - Introduce the formal definition of Boolean Rules and Laws by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Boolean Rules and Laws –Highlight the size of the Boolean Rules and Laws in Computer Organization 2. **Development** (30 minutes) Boolean Rules and Laws - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Boolean Rules and Laws Models - Introduce the concepts of Boolean Rules and Laws with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Boolean Rules and Laws . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Boolean Rules and Laws a. Advantages of Boolean Rules and Laws b. Challenges in of Boolean Rules and Laws - Security - National Laws on Data Storage - Vendor Lock-in

	- Energy Efficiency (Give example of energy consumption in large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Boolean Rules and Laws. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Boolean Rules and Laws http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Boolean Rules and Laws concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Boolean Rules and Laws Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 05	Course Name: Computer Organization Topic: De-Morgan's Theorem	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of De- Morgans Theorem b. select the appropriate De- Morgans Theorem for different use-case scenarios. c. illustrate different types of De- Morgans Theorem with examples. d. appreciate advantages of De- Morgans Theorem its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which De- Morgans Theorem do the students use? where is your De- Morgans Theorem has been stored? do you know the location of your De- Morgans Theorem? - Introduce the concept of De- Morgans Theorem. Show Figure on slide. - Introduce the formal definition of De- Morgans Theorem by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the De- Morgans Theorem –Highlight the size of the De- Morgans Theorem in Computer Organization 2. **Development** (30 minutes) De- Morgans Theorem - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. De- Morgans Theorem Models - Introduce the concepts of De- Morgans Theorem with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of De- Morgans Theorem . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in De- Morgans Theorem a. Advantages of De- Morgans Theorem b. Challenges in of De- Morgans Theorem - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in

	large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate De-Morgans Theorem. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on De- Morgans Theorem http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting De- Morgans Theorem concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on De- Morgans Theorem Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 06	Course Name: Computer Organization Topic: Simplification of Logical Variables	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Simplification of Logical variables b. select the appropriate Simplification of Logical variables for different use-case scenarios. c. illustrate different types of Simplification of Logical variables with examples. d. appreciate advantages of Simplification of Logical variables its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Simplification of Logical variables do the students use? where is your Simplification of Logical variables has been stored? do you know the location of your Simplification of Logical variables? - Introduce the concept of Simplification of Logical variables. Show Figure on slide. - Introduce the formal definition of Simplification of Logical variables by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Simplification of Logical variables –Highlight the size of the Simplification of Logical variables in Computer Organization 2. **Development** (30 minutes) Simplification of Logical variables - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Simplification of Logical variables Models - Introduce the concepts of Simplification of Logical variables with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Simplification of Logical variables . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Simplification of Logical variables a. Advantages of Simplification of Logical variables

	b. Challenges in of Simplification of Logical variables - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Simplification of Logical variables. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Simplification of Logical variables http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Simplification of Logical variables concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Simplification of Logical variables Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 07	Course Name: Computer Organization Topic: Simplification of Logical variables using K-Map SOP Form Using K-Map SOP Form	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Simplification of Logical variables using K-Map SOP Form b. select the appropriate Simplification of Logical variables using K-Map SOP Form for different use-case scenarios. c. illustrate different types of Simplification of Logical variables using K-Map SOP Form with examples. d. appreciate advantages of Simplification of Logical variables using K-Map SOP Form its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Simplification of Logical variables using K-Map SOP Form do the students use? where is your Simplification of Logical variables using K-Map SOP Form has been stored? do you know the location of your Simplification of Logical variables using K-Map SOP Form? - Introduce the concept of Simplification of Logical variables using K-Map SOP Form. Show Figure on slide. - Introduce the formal definition of Simplification of Logical variables using K-Map SOP Form by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Simplification of Logical variables using K-Map SOP Form –Highlight the size of the Simplification of Logical variables using K-Map SOP Form in Computer Organization 2. **Development** (30 minutes) Simplification of Logical variables using K-Map SOP Form - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Simplification of Logical variables using K-Map SOP Form Models - Introduce the concepts of Simplification of Logical variables using K-Map SOP Form with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Simplification of Logical

	variables using K-Map SOP Form . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Simplification of Logical variables using K-Map SOP Form a. Advantages of Simplification of Logical variables using K-Map SOP Form b. Challenges in of Simplification of Logical variables using K-Map SOP Form - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Simplification of Logical variables using K-Map SOP Form. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Simplification of Logical variables using K-Map SOP Form http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Simplification of Logical variables using K-Map SOP Form concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Simplification of Logical variables using K-Map SOP Form Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 08	Course Name: Computer Organization Topic: Simplification of Logical variables using K-Map POS Form Using K-Map POS Form	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Simplification of Logical variables using K-Map POS Form b. select the appropriate Simplification of Logical variables using K-Map POS Form for different use-case scenarios. c. illustrate different types of Simplification of Logical variables using K-Map POS Form with examples. d. appreciate advantages of Simplification of Logical variables using K-Map POS Form its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Simplification of Logical variables using K-Map POS Form do the students use? where is your Simplification of Logical variables using K-Map POS Form has been stored? do you know the location of your Simplification of Logical variables using K-Map POS Form? - Introduce the concept of Simplification of Logical variables using K-Map POS Form. Show Figure on slide. - Introduce the formal definition of Simplification of Logical variables using K-Map POS Form by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Simplification of Logical variables using K-Map POS Form –Highlight the size of the Simplification of Logical variables using K-Map POS Form in Computer Organization 2. **Development** (30 minutes) Simplification of Logical variables using K-Map POS Form - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Simplification of Logical variables using K-Map POS Form Models - Introduce the concepts of Simplification of Logical variables using K-Map POS Form with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Simplification of Logical

	variables using K-Map POS Form . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Simplification of Logical variables using K-Map POS Form a. Advantages of Simplification of Logical variables using K-Map POS Form b. Challenges in of Simplification of Logical variables using K-Map POS Form - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Simplification of Logical variables using K-Map POS Form. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Simplification of Logical variables using K-Map POS Form http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Simplification of Logical variables using K-Map POS Form concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Simplification of Logical variables using K-Map POS Form Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 09	Course Name: Computer Organization Topic: Encoder	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Encoder and its types b. select the appropriate Encoder and its types for different use-case scenarios. c. illustrate different types of Encoder and its types with examples. d. appreciate advantages of Encoder and its types its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Encoder and its types do the students use? where is your Encoder and its types has been stored? do you know the location of your Encoder and its types? - Introduce the concept of Encoder and its types. Show Figure on slide. - Introduce the formal definition of Encoder and its types by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Encoder and its types –Highlight the size of the Encoder and its types in Computer Organization 2. **Development** (30 minutes) Encoder and its types - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Encoder and its types Models - Introduce the concepts of Encoder and its types with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Encoder and its types . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Encoder and its types a. Advantages of Encoder and its types b. Challenges in of Encoder and its types - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in

	large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Encoder and its types. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Encoder and its types http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Encoder and its types concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Encoder and its types Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 10	Course Name: Computer Organization Topic: Encoder	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Decoder and its types b. select the appropriate Decoder and its types for different use-case scenarios. c. illustrate different types of Decoder and its types with examples. d. appreciate advantages of Decoder and its types its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Decoder and its types do the students use? where is your Decoder and its types has been stored? do you know the location of your Decoder and its types? - Introduce the concept of Decoder and its types. Show Figure on slide. - Introduce the formal definition of Decoder and its types by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Decoder and its types –Highlight the size of the Decoder and its types in Computer Organization 2. **Development** (30 minutes) Decoder and its types - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Decoder and its types Models - Introduce the concepts of Decoder and its types with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Decoder and its types . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Decoder and its types a. Advantages of Decoder and its types b. Challenges in of Decoder and its types - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in

	large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Decoder and its types. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Decoder and its types http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Decoder and its types concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Decoder and its types Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 11	Course Name: Computer Organization Topic: Comparator	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Comparator and its types b. select the appropriate Comparator and its types for different use-case scenarios. c. illustrate different types of Comparator and its types with examples. d. appreciate advantages of Comparator and its types its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Comparator and its types do the students use? where is your Comparator and its types has been stored? do you know the location of your Comparator and its types? - Introduce the concept of Comparator and its types. Show Figure on slide. - Introduce the formal definition of Comparator and its types by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Comparator and its types –Highlight the size of the Comparator and its types in Computer Organization 2. **Development** (30 minutes) Comparator and its types - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Comparator and its types Models - Introduce the concepts of Comparator and its types with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Comparator and its types . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Comparator and its types a. Advantages of Comparator and its types b. Challenges in of Comparator and its types - Security - National Laws on Data Storage - Vendor Lock-in

	- Energy Efficiency (Give example of energy consumption in large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Comparator and its types. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Comparator and its types http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Comparator and its types concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Comparator and its types Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 12	Course Name: Computer Organization Topic: Adders	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Adders and its types b. select the appropriate Adders and its types for different use-case scenarios. c. illustrate different types of Adders and its types with examples. d. appreciate advantages of Adders and its types its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Adders and its types do the students use? where is your Adders and its types has been stored? do you know the location of your Adders and its types? - Introduce the concept of Adders and its types. Show Figure on slide. - Introduce the formal definition of Adders and its types by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Adders and its types –Highlight the size of the Adders and its types in Computer Organization 2. **Development** (30 minutes) Adders and its types - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Adders and its types Models - Introduce the concepts of Adders and its types with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Adders and its types . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Adders and its types a. Advantages of Adders and its types b. Challenges in of Adders and its types - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in

	large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Adders and its types. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Adders and its types http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Adders and its types concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Adders and its types Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 13	Course Name: Computer Organization Topic: Subtractors	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Subtractors and its types b. select the appropriate Subtractors and its types for different use-case scenarios. c. illustrate different types of Subtractors and its types with examples. d. appreciate advantages of Subtractors and its types its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Subtractors and its types do the students use? where is your Subtractors and its types has been stored? do you know the location of your Subtractors and its types? - Introduce the concept of Subtractors and its types. Show Figure on slide. - Introduce the formal definition of Subtractors and its types by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Subtractors and its types –Highlight the size of the Subtractors and its types in Computer Organization 2. **Development** (30 minutes) Subtractors and its types - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Subtractors and its types Models - Introduce the concepts of Subtractors and its types with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Subtractors and its types . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Subtractors and its types a. Advantages of Subtractors and its types b. Challenges in of Subtractors and its types - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in

	large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Subtractors and its types. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Subtractors and its types http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Subtractors and its types concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Subtractors and its types Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 14	Course Name: Computer Organization Topic: Multiplexers	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Multiplexers and its types b. select the appropriate Multiplexers and its types for different use-case scenarios. c. illustrate different types of Multiplexers and its types with examples. d. appreciate advantages of Multiplexers and its types its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Multiplexers and its types do the students use? where is your Multiplexers and its types has been stored? do you know the location of your Multiplexers and its types? - Introduce the concept of Multiplexers and its types. Show Figure on slide. - Introduce the formal definition of Multiplexers and its types by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Multiplexers and its types –Highlight the size of the Multiplexers and its types in Computer Organization 2. **Development** (30 minutes) Multiplexers and its types - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Multiplexers and its types Models - Introduce the concepts of Multiplexers and its types with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Multiplexers and its types . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Multiplexers and its types a. Advantages of Multiplexers and its types b. Challenges in of Multiplexers and its types - Security - National Laws on Data Storage - Vendor Lock-in

	- Energy Efficiency (Give example of energy consumption in large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Multiplexers and its types. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Multiplexers and its types http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Multiplexers and its types concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Multiplexers and its types Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 15	Course Name: Computer Organization Topic: De-multiplexers	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of De-multiplexers and its types b. select the appropriate De-multiplexers and its types for different use-case scenarios. c. illustrate different types of De-multiplexers and its types with examples. d. appreciate advantages of De-multiplexers and its types its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which De-multiplexers and its types do the students use? where is your De-multiplexers and its types has been stored? do you know the location of your De-multiplexers and its types? - Introduce the concept of De-multiplexers and its types. Show Figure on slide. - Introduce the formal definition of De-multiplexers and its types by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the De-multiplexers and its types –Highlight the size of the De-multiplexers and its types in Computer Organization 2. **Development** (30 minutes) De-multiplexers and its types - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. De-multiplexers and its types Models - Introduce the concepts of De-multiplexers and its types with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of De-multiplexers and its types . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in De-multiplexers and its types a. Advantages of De-multiplexers and its types b. Challenges in of De-multiplexers and its types - Security

	- National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate De-multiplexers and its types. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on De-multiplexers and its types http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting De-multiplexers and its types concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on De-multiplexers and its types Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 16	Course Name: Computer Organization Topic: D Flip Flop	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of D Flip Flop b. select the appropriate D Flip Flop for different use-case scenarios. c. illustrate different types of D Flip Flop with examples. d. appreciate advantages of D Flip Flop its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which D Flip Flop do the students use? where is your D Flip Flop has been stored? do you know the location of your D Flip Flop? - Introduce the concept of D Flip Flop. Show Figure on slide. - Introduce the formal definition of D Flip Flop by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the D Flip Flop – Highlight the size of the D Flip Flop in Computer Organization 2. **Development** (30 minutes) D Flip Flop - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. D Flip Flop Models - Introduce the concepts of D Flip Flop with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of D Flip Flop . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in D Flip Flop a. Advantages of D Flip Flop b. Challenges in of D Flip Flop - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers) - Resource Utilization 3. Exercise (5 minutes) –

	Give different use-cases and make students select appropriate D Flip Flop. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on D Flip Flop http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting D Flip Flop concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on D Flip Flop Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 17	Course Name: Computer Organization Topic: SR Flip Flop	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of SR Flip Flop b. select the appropriate SR Flip Flop for different use-case scenarios. c. illustrate different types of SR Flip Flop with examples. d. appreciate advantages of SR Flip Flop its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which SR Flip Flop do the students use? where is your SR Flip Flop has been stored? do you know the location of your SR Flip Flop? - Introduce the concept of SR Flip Flop. Show Figure on slide. - Introduce the formal definition of SR Flip Flop by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the SR Flip Flop – Highlight the size of the SR Flip Flop in Computer Organization 2. **Development** (30 minutes) SR Flip Flop - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. SR Flip Flop Models - Introduce the concepts of SR Flip Flop with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of SR Flip Flop . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in SR Flip Flop a. Advantages of SR Flip Flop b. Challenges in of SR Flip Flop - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers) - Resource Utilization

	3. Exercise (5 minutes) – Give different use-cases and make students select appropriate SR Flip Flop. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on SR Flip Flop http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting SR Flip Flop concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on SR Flip Flop Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 18	Course Name: Computer Organization Topic: JK Flip Flop	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of JK Flip Flop b. select the appropriate JK Flip Flop for different use-case scenarios. c. illustrate different types of JK Flip Flop with examples. d. appreciate advantages of JK Flip Flop its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which JK Flip Flop do the students use? where is your JK Flip Flop has been stored? do you know the location of your JK Flip Flop? - Introduce the concept of JK Flip Flop. Show Figure on slide. - Introduce the formal definition of JK Flip Flop by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the JK Flip Flop – Highlight the size of the JK Flip Flop in Computer Organization 2. **Development** (30 minutes) JK Flip Flop - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. JK Flip Flop Models - Introduce the concepts of JK Flip Flop with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of JK Flip Flop . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in JK Flip Flop a. Advantages of JK Flip Flop b. Challenges in of JK Flip Flop - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers) - Resource Utilization

	3. Exercise (5 minutes) – Give different use-cases and make students select appropriate JK Flip Flop. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on JK Flip Flop http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting JK Flip Flop concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on JK Flip Flop Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 19	Course Name: Computer Organization Topic: T Flip Flop	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of T Flip Flop b. select the appropriate T Flip Flop for different use-case scenarios. c. illustrate different types of T Flip Flop with examples. d. appreciate advantages of T Flip Flop its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which T Flip Flop do the students use? where is your T Flip Flop has been stored? do you know the location of your T Flip Flop? - Introduce the concept of T Flip Flop. Show Figure on slide. - Introduce the formal definition of T Flip Flop by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the T Flip Flop – Highlight the size of the T Flip Flop in Computer Organization 2. **Development** (30 minutes) T Flip Flop - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. T Flip Flop Models - Introduce the concepts of T Flip Flop with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of T Flip Flop . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in T Flip Flop a. Advantages of T Flip Flop b. Challenges in of T Flip Flop - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers) - Resource Utilization 3. Exercise (5 minutes) –

	Give different use-cases and make students select appropriate T Flip Flop. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on T Flip Flop http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting T Flip Flop concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on T Flip Flop Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 20	Course Name: Computer Organization Topic: Introduction to Registers	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Introduction to Registers b. select the appropriate Introduction to Registers for different use-case scenarios. c. illustrate different types of Introduction to Registers with examples. d. appreciate advantages of Introduction to Registers its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Introduction to Registers do the students use? where is your Introduction to Registers has been stored? do you know the location of your Introduction to Registers? - Introduce the concept of Introduction to Registers. Show Figure on slide. - Introduce the formal definition of Introduction to Registers by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Introduction to Registers –Highlight the size of the Introduction to Registers in Computer Organization 2. **Development** (30 minutes) Introduction to Registers - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Introduction to Registers Models - Introduce the concepts of Introduction to Registers with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Introduction to Registers . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Introduction to Registers a. Advantages of Introduction to Registers b. Challenges in of Introduction to Registers - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in

	large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Introduction to Registers. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Introduction to Registers http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Introduction to Registers concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Introduction to Registers Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 21	Course Name: Computer Organization Topic: Shift Registers	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Shift Registers b. select the appropriate Shift Registers for different use-case scenarios. c. illustrate different types of Shift Registers with examples. d. appreciate advantages of Shift Registers its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Shift Registers do the students use? where is your Shift Registers has been stored? do you know the location of your Shift Registers? - Introduce the concept of Shift Registers. Show Figure on slide. - Introduce the formal definition of Shift Registers by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Shift Registers – Highlight the size of the Shift Registers in Computer Organization 2. **Development** (30 minutes) Shift Registers - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Shift Registers Models - Introduce the concepts of Shift Registers with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Shift Registers . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Shift Registers a. Advantages of Shift Registers b. Challenges in of Shift Registers - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers) - Resource Utilization

	3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Shift Registers. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Shift Registers http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Shift Registers concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Shift Registers Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 22	Course Name: Computer Organization Topic: Counters	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Counters and its types b. select the appropriate Counters and its types for different use-case scenarios. c. illustrate different types of Counters and its types with examples. d. appreciate advantages of Counters and its types its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Counters and its types do the students use? where is your Counters and its types has been stored? do you know the location of your Counters and its types? - Introduce the concept of Counters and its types. Show Figure on slide. - Introduce the formal definition of Counters and its types by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Counters and its types –Highlight the size of the Counters and its types in Computer Organization 2. **Development** (30 minutes) Counters and its types - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Counters and its types Models - Introduce the concepts of Counters and its types with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Counters and its types . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Counters and its types a. Advantages of Counters and its types b. Challenges in of Counters and its types - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in

	large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Counters and its types. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Counters and its types http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Counters and its types concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Counters and its types Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 23	Course Name: Computer Organization Topic: Instruction Codes	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Instruction Codes b. select the appropriate Instruction Codes for different use-case scenarios. c. illustrate different types of Instruction Codes with examples. d. appreciate advantages of Instruction Codes its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Instruction Codes do the students use? where is your Instruction Codes has been stored? do you know the location of your Instruction Codes? - Introduce the concept of Instruction Codes. Show Figure on slide. - Introduce the formal definition of Instruction Codes by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Instruction Codes –Highlight the size of the Instruction Codes in Computer Organization 2. **Development** (30 minutes) Instruction Codes - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Instruction Codes Models - Introduce the concepts of Instruction Codes with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Instruction Codes . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Instruction Codes a. Advantages of Instruction Codes b. Challenges in of Instruction Codes - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers)

	- Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Instruction Codes. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Instruction Codes http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Instruction Codes concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Instruction Codes Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 24	Course Name: Computer Organization Topic: Stored Program Organization	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Stored Program Organization b. select the appropriate Stored Program Organization for different use-case scenarios. c. illustrate different types of Stored Program Organization with examples. d. appreciate advantages of Stored Program Organization its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Stored Program Organization do the students use? where is your Stored Program Organization has been stored? do you know the location of your Stored Program Organization? - Introduce the concept of Stored Program Organization. Show Figure on slide. - Introduce the formal definition of Stored Program Organization by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Stored Program Organization –Highlight the size of the Stored Program Organization in Computer Organization 2. **Development** (30 minutes) Stored Program Organization - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Stored Program Organization Models - Introduce the concepts of Stored Program Organization with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Stored Program Organization . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Stored Program Organization a. Advantages of Stored Program Organization b. Challenges in of Stored Program Organization - Security

	- National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Stored Program Organization. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Stored Program Organization http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Stored Program Organization concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Stored Program Organization Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 25	Course Name: Computer Organization Topic: Indirect Address	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Indirect Address b. select the appropriate Indirect Address for different use-case scenarios. c. illustrate different types of Indirect Address with examples. d. appreciate advantages of Indirect Address its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Indirect Address do the students use? where is your Indirect Address has been stored? do you know the location of your Indirect Address? - Introduce the concept of Indirect Address. Show Figure on slide. - Introduce the formal definition of Indirect Address by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Indirect Address – Highlight the size of the Indirect Address in Computer Organization 2. **Development** (30 minutes) Indirect Address - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Indirect Address Models - Introduce the concepts of Indirect Address with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Indirect Address . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Indirect Address a. Advantages of Indirect Address b. Challenges in of Indirect Address - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers)

	- Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Indirect Address. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Indirect Address http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Indirect Address concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Indirect Address Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 26	Course Name: Computer Organization Topic: Computer Registers	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Computer Registers b. select the appropriate Computer Registers for different use-case scenarios. c. illustrate different types of Computer Registers with examples. d. appreciate advantages of Computer Registers its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Computer Registers do the students use? where is your Computer Registers has been stored? do you know the location of your Computer Registers? - Introduce the concept of Computer Registers. Show Figure on slide. - Introduce the formal definition of Computer Registers by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Computer Registers –Highlight the size of the Computer Registers in Computer Organization 2. **Development** (30 minutes) Computer Registers - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Computer Registers Models - Introduce the concepts of Computer Registers with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Computer Registers . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Computer Registers a. Advantages of Computer Registers b. Challenges in of Computer Registers - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers)

	- Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Computer Registers. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Computer Registers http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Computer Registers concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Computer Registers Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 27	Course Name: Computer Organization Topic: Common Bus System	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Common Bus System b. select the appropriate Common Bus System for different use-case scenarios. c. illustrate different types of Common Bus System with examples. d. appreciate advantages of Common Bus System its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Common Bus System do the students use? where is your Common Bus System has been stored? do you know the location of your Common Bus System? - Introduce the concept of Common Bus System. Show Figure on slide. - Introduce the formal definition of Common Bus System by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Common Bus System –Highlight the size of the Common Bus System in Computer Organization 2. **Development** (30 minutes) Common Bus System - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Common Bus System Models - Introduce the concepts of Common Bus System with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Common Bus System . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Common Bus System a. Advantages of Common Bus System b. Challenges in of Common Bus System - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in

	large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Common Bus System. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Common Bus System http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Common Bus System concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Common Bus System Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 28	Course Name: Computer Organization Topic: Computer Instruction	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Computer Instruction b. select the appropriate Computer Instruction for different use-case scenarios. c. illustrate different types of Computer Instruction with examples. d. appreciate advantages of Computer Instruction its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Computer Instruction do the students use? where is your Computer Instruction has been stored? do you know the location of your Computer Instruction? - Introduce the concept of Computer Instruction. Show Figure on slide. - Introduce the formal definition of Computer Instruction by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Computer Instruction –Highlight the size of the Computer Instruction in Computer Organization 2. **Development** (30 minutes) Computer Instruction - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Computer Instruction Models - Introduce the concepts of Computer Instruction with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Computer Instruction . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Computer Instruction a. Advantages of Computer Instruction b. Challenges in of Computer Instruction - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in

	large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Computer Instruction. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Computer Instruction http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Computer Instruction concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Computer Instruction Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 29	Course Name: Computer Organization Topic: Timing and Control	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Timing and Control b. select the appropriate Timing and Control for different use-case scenarios. c. illustrate different types of Timing and Control with examples. d. appreciate advantages of Timing and Control its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Timing and Control do the students use? where is your Timing and Control has been stored? do you know the location of your Timing and Control? - Introduce the concept of Timing and Control. Show Figure on slide. - Introduce the formal definition of Timing and Control by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Timing and Control –Highlight the size of the Timing and Control in Computer Organization 2. **Development** (30 minutes) Timing and Control - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Timing and Control Models - Introduce the concepts of Timing and Control with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Timing and Control . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Timing and Control a. Advantages of Timing and Control b. Challenges in of Timing and Control - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers)

	- Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Timing and Control. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Timing and Control http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Timing and Control concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Timing and Control Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 30	Course Name: Computer Organization Topic: Instruction Cycle	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Instruction Cycle b. select the appropriate Instruction Cycle for different use-case scenarios. c. illustrate different types of Instruction Cycle with examples. d. appreciate advantages of Instruction Cycle its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Instruction Cycle do the students use? where is your Instruction Cycle has been stored? do you know the location of your Instruction Cycle? - Introduce the concept of Instruction Cycle. Show Figure on slide. - Introduce the formal definition of Instruction Cycle by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Instruction Cycle –Highlight the size of the Instruction Cycle in Computer Organization 2. **Development** (30 minutes) Instruction Cycle - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Instruction Cycle Models - Introduce the concepts of Instruction Cycle with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Instruction Cycle . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Instruction Cycle a. Advantages of Instruction Cycle b. Challenges in of Instruction Cycle - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers)

	- Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Instruction Cycle. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Instruction Cycle http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Instruction Cycle concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Instruction Cycle Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 31	Course Name: Computer Organization Topic: I/O Interrupt	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of I/O Interrupt b. select the appropriate I/O Interrupt for different use-case scenarios. c. illustrate different types of I/O Interrupt with examples. d. appreciate advantages of I/O Interrupt its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which I/O Interrupt do the students use? where is your I/O Interrupt has been stored? do you know the location of your I/O Interrupt ? - Introduce the concept of I/O Interrupt . Show Figure on slide. - Introduce the formal definition of I/O Interrupt by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the I/O Interrupt – Highlight the size of the I/O Interrupt in Computer Organization 2. **Development** (30 minutes) I/O Interrupt - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. I/O Interrupt Models - Introduce the concepts of I/O Interrupt with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of I/O Interrupt . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in I/O Interrupt a. Advantages of I/O Interrupt b. Challenges in of I/O Interrupt - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers) - Resource Utilization

	3. Exercise (5 minutes) – Give different use-cases and make students select appropriate I/O Interrupt . Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on I/O Interrupt http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting I/O Interrupt concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on I/O Interrupt Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 32	Course Name: Computer Organization Topic: Design of Computer	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Design of Computer b. select the appropriate Design of Computer for different use-case scenarios. c. illustrate different types of Design of Computer with examples. d. appreciate advantages of Design of Computer its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Design of Computer do the students use? where is your Design of Computer has been stored? do you know the location of your Design of Computer ? - Introduce the concept of Design of Computer . Show Figure on slide. - Introduce the formal definition of Design of Computer by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Design of Computer –Highlight the size of the Design of Computer in Computer Organization 2. **Development** (30 minutes) Design of Computer - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Design of Computer Models - Introduce the concepts of Design of Computer with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Design of Computer . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Design of Computer a. Advantages of Design of Computer b. Challenges in of Design of Computer - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in

	large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Design of Computer . Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Design of Computer http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Design of Computer concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Design of Computer Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 33	Course Name: Computer Organization Topic: Memory Hierarchy	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Memory Hierarchy b. select the appropriate Memory Hierarchy for different use-case scenarios. c. illustrate different types of Memory Hierarchy with examples. d. appreciate advantages of Memory Hierarchy its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Memory Hierarchy do the students use? where is your Memory Hierarchy has been stored? do you know the location of your Memory Hierarchy ? - Introduce the concept of Memory Hierarchy . Show Figure on slide. - Introduce the formal definition of Memory Hierarchy by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Memory Hierarchy –Highlight the size of the Memory Hierarchy in Computer Organization 2. **Development** (30 minutes) Memory Hierarchy - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Memory Hierarchy Models - Introduce the concepts of Memory Hierarchy with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Memory Hierarchy . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Memory Hierarchy a. Advantages of Memory Hierarchy b. Challenges in of Memory Hierarchy - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers)

	- Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Memory Hierarchy . Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Memory Hierarchy http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Memory Hierarchy concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Memory Hierarchy Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 34	Course Name: Computer Organization Topic: RAM/ROM Chips	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of RAM/ROM Chips b. select the appropriate RAM/ROM Chips for different use-case scenarios. c. illustrate different types of RAM/ROM Chips with examples. d. appreciate advantages of RAM/ROM Chips its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which RAM/ROM Chips do the students use? where is your RAM/ROM Chips has been stored? do you know the location of your RAM/ROM Chips ? - Introduce the concept of RAM/ROM Chips . Show Figure on slide. - Introduce the formal definition of RAM/ROM Chips by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the RAM/ROM Chips –Highlight the size of the RAM/ROM Chips in Computer Organization 2. **Development** (30 minutes) RAM/ROM Chips - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. RAM/ROM Chips Models - Introduce the concepts of RAM/ROM Chips with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of RAM/ROM Chips . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in RAM/ROM Chips a. Advantages of RAM/ROM Chips b. Challenges in of RAM/ROM Chips - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers)

	- Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate RAM/ROM Chips . Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on RAM/ROM Chips http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting RAM/ROM Chips concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on RAM/ROM Chips Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 35	Course Name: Computer Organization Topic: Memory Address Map	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Memory Address Map b. select the appropriate Memory Address Map for different use-case scenarios. c. illustrate different types of Memory Address Map with examples. d. appreciate advantages of Memory Address Map its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Memory Address Map do the students use? where is your Memory Address Map has been stored? do you know the location of your Memory Address Map ? - Introduce the concept of Memory Address Map . Show Figure on slide. - Introduce the formal definition of Memory Address Map by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Memory Address Map –Highlight the size of the Memory Address Map in Computer Organization 2. **Development** (30 minutes) Memory Address Map - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Memory Address Map Models - Introduce the concepts of Memory Address Map with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Memory Address Map . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Memory Address Map a. Advantages of Memory Address Map b. Challenges in of Memory Address Map - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in

	large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Memory Address Map . Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Memory Address Map http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Memory Address Map concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Memory Address Map Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 36	Course Name: Computer Organization Topic: Organization of RAM	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Organization of RAM b. select the appropriate Organization of RAM for different use-case scenarios. c. illustrate different types of Organization of RAM with examples. d. appreciate advantages of Organization of RAM its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Organization of RAM do the students use? where is your Organization of RAM has been stored? do you know the location of your Organization of RAM ? - Introduce the concept of Organization of RAM . Show Figure on slide. - Introduce the formal definition of Organization of RAM by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Organization of RAM –Highlight the size of the Organization of RAM in Computer Organization 2. **Development** (30 minutes) Organization of RAM - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Organization of RAM Models - Introduce the concepts of Organization of RAM with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Organization of RAM . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Organization of RAM a. Advantages of Organization of RAM b. Challenges in of Organization of RAM - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in

	large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Organization of RAM . Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Organization of RAM http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Organization of RAM concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Organization of RAM Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 37	Course Name: Computer Organization Topic: Read Only Memory	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Read only memory b. select the appropriate Read only memory for different use-case scenarios. c. illustrate different types of Read only memory with examples. d. appreciate advantages of Read only memory its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Read only memory do the students use? where is your Read only memory has been stored? do you know the location of your Read only memory ? - Introduce the concept of Read only memory . Show Figure on slide. - Introduce the formal definition of Read only memory by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Read only memory –Highlight the size of the Read only memory in Computer Organization 2. **Development** (30 minutes) Read only memory - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Read only memory Models - Introduce the concepts of Read only memory with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Read only memory . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Read only memory a. Advantages of Read only memory b. Challenges in of Read only memory - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers)

	- Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Read only memory . Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Read only memory http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Read only memory concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Read only memory Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 38	Course Name: Computer Organization Topic: Auxiliary Memory	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Auxiliary Memory b. select the appropriate Auxiliary Memory for different use-case scenarios. c. illustrate different types of Auxiliary Memory with examples. d. appreciate advantages of Auxiliary Memory its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Auxiliary Memory do the students use? where is your Auxiliary Memory has been stored? do you know the location of your Auxiliary Memory ? - Introduce the concept of Auxiliary Memory . Show Figure on slide. - Introduce the formal definition of Auxiliary Memory by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Auxiliary Memory –Highlight the size of the Auxiliary Memory in Computer Organization 2. **Development** (30 minutes) Auxiliary Memory - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Auxiliary Memory Models - Introduce the concepts of Auxiliary Memory with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Auxiliary Memory . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Auxiliary Memory a. Advantages of Auxiliary Memory b. Challenges in of Auxiliary Memory - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers)

	- Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Auxiliary Memory . Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Auxiliary Memory http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Auxiliary Memory concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Auxiliary Memory Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 39	Course Name: Computer Organization Topic: Associative Memory	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Associative Memory b. select the appropriate Associative Memory for different use-case scenarios. c. illustrate different types of Associative Memory with examples. d. appreciate advantages of Associative Memory its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Associative Memory do the students use? where is your Associative Memory has been stored? do you know the location of your Associative Memory ? - Introduce the concept of Associative Memory . Show Figure on slide. - Introduce the formal definition of Associative Memory by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Associative Memory –Highlight the size of the Associative Memory in Computer Organization 2. **Development** (30 minutes) Associative Memory - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Associative Memory Models - Introduce the concepts of Associative Memory with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Associative Memory . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Associative Memory a. Advantages of Associative Memory b. Challenges in of Associative Memory - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in

	large data centers) - Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Associative Memory . Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Associative Memory http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Associative Memory concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Associative Memory Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 40	Course Name: Computer Organization Topic: Cache Memory	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Cache memory b. select the appropriate Cache memory for different use-case scenarios. c. illustrate different types of Cache memory with examples. d. appreciate advantages of Cache memory its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Cache memory do the students use? where is your Cache memory has been stored? do you know the location of your Cache memory ? - Introduce the concept of Cache memory . Show Figure on slide. - Introduce the formal definition of Cache memory by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Cache memory – Highlight the size of the Cache memory in Computer Organization 2. **Development** (30 minutes) Cache memory - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Cache memory Models - Introduce the concepts of Cache memory with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Cache memory . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Cache memory a. Advantages of Cache memory b. Challenges in of Cache memory - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers)

	- Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Cache memory . Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Cache memory http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Cache memory concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Cache memory Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 41	Course Name: Computer Organization Topic: Virtual Memory	Course No.: BCAMJ-302

Objectives	At the end of the lesson the student shall be able to: a. articulate the concept of Virtual memory b. select the appropriate Virtual memory for different use-case scenarios. c. illustrate different types of Virtual memory with examples. d. appreciate advantages of Virtual memory its types
Teaching Aids (if any)	a. Video of Facebook data center b. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. which Virtual memory do the students use? where is your Virtual memory has been stored? do you know the location of your Virtual memory ? - Introduce the concept of Virtual memory . Show Figure on slide. - Introduce the formal definition of Virtual memory by NIST http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf - Highlight the important characteristics of the Virtual memory –Highlight the size of the Virtual memory in Computer Organization 2. **Development** (30 minutes) Virtual memory - Show video of Facebook Data Center https://www.youtube.com/watch?v=_r97qdyQtIk - Introduce concept of virtualization and improving resource utilization. Virtual memory Models - Introduce the concepts of Virtual memory with examples. - Show figures to illustrate differences in the models and their ability to cater to different needs of Virtual memory . - Give example of a Number system), which can be easily converted on the circuits . Major Number systems in Virtual memory a. Advantages of Virtual memory b. Challenges in of Virtual memory - Security - National Laws on Data Storage - Vendor Lock-in - Energy Efficiency (Give example of energy consumption in large data centers)

	- Resource Utilization 3. Exercise (5 minutes) – Give different use-cases and make students select appropriate Virtual memory . Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading - Original NIST Paper on Virtual memory http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf 3. Homework - Create your video log highlighting Virtual memory concepts and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Virtual memory Spend 5 minutes to evaluate student assimilation of the lesson contents