



# Department of Computer Science

## Outcome-Based Education (OBE)



The Department of Computer Science is following Outcome-Based Education (OBE) in accordance with the guidelines provided by the Higher Education Commission (HEC) and National Computing Education Accreditation Council (NCEAC) for all its undergraduate degree programs.

### Vision and Mission statements

The vision and mission statement of Air University, along with the mission of the Department of Computer Science, are presented below:

#### Vision of Air University

Air University aspires to be recognized globally in innovative research, transformative education, and sustainable development. It aims to foster a culture of creativity, inclusivity, and collaboration, preparing graduates to become ethical leaders and change-makers in a rapidly evolving world.

#### Mission of Air University

Air University's mission is to deliver world-class education and research that addresses global challenges and drives societal progress. It nurtures intellectual growth, ethical values, and prepares graduates to excel professionally, become self-sustained entrepreneurs, and lead with integrity and compassion. Through interdisciplinary research and collaboration with industry, government, and international partners, the university aims to contribute towards economic, technological, and social development while promoting diversity, equity, and inclusion.

#### Mission of the Department of Computer Science

The Department of Computer Science is committed to excellence in computing and interdisciplinary research, addressing emerging technological challenges. Through strong industry and research collaborations, the department develops sound professional graduates having ethical values who contribute to sustainable technological and societal advancements.

Key Values:

1. Sound Professionals
2. Excellence in computing
3. Interdisciplinary research
4. Industry Collaboration

#### Program Objectives (POs)

The objectives of the programs offered by the Department of Computer Science are as follows:

*Handwritten signature and date: 6/09/26*

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- **BS Computer Science (BSCS)**

Following are the POs for the students pursuing their BS degree in the BS Computer Science program:

| Sr. # | Description                                                                                                                                                                                                         |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PO 1  | <b>Designing Solutions for Complex Problem</b><br>Apply computing knowledge and analytical skills to design innovative solutions for complex and emerging technological challenges                                  |
| PO 2  | <b>Ethical, Professional and Effective Communicator</b><br>Demonstrate professionalism, effective communication skills, ethical values, and the ability to collaborate in multidisciplinary industrial environments |
| PO 3  | <b>Teamwork and Lifelong Learning</b><br>Engage in continuous learning and collaborative teamwork to contribute to technological and societal advancement in alignment with the Sustainable Development Goals       |

### Graduate Attributes (GAs)

Department of Computer Science inherits Graduate Attributes from HEC and NCEAC guidelines that are adopted from the Seoul Accord. Following are the graduate attributes for the students pursuing their BS degree at the Department of Computer Science:

| Sr. # | Statement                                                                                                                                                                                                                                                                                                                             |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GA 1  | <b>Academic Education</b><br>To prepare graduates as computing professionals.                                                                                                                                                                                                                                                         |
| GA 2  | <b>Knowledge for Solving Computing Problems</b><br>Apply knowledge of computing fundamentals, knowledge of computing specialization, and mathematics, science, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements. |
| GA 3  | <b>Problem Analysis</b><br>Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.                                                                                        |
| GA 4  | <b>Design/ Development of Solutions</b><br>Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.                       |
| GA 5  | <b>Modern Tool Usage</b><br>Create, select, adapt, and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.                                                                                                                                 |
| GA 6  | <b>Individual and Teamwork</b><br>Function effectively as an individual and as a member or leader in diverse teams and in multi-disciplinary settings.                                                                                                                                                                                |

|              |                                                                                                                                                                                                                                                                                                   |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>GA 7</b>  | <b>Communication</b><br>Communicate effectively with the computing community and with society at large about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions |
| <b>GA 8</b>  | <b>Computing Professionalism and Society</b><br>Understand and assess societal, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice                                                   |
| <b>GA 9</b>  | <b>Ethics</b><br>Understand and commit to professional ethics, responsibilities, and norms of professional computing practice                                                                                                                                                                     |
| <b>GA 10</b> | <b>Life-long Learning</b><br>Recognize the need and have the ability to engage in independent learning for continual development as a computing professional.                                                                                                                                     |

### Mapping of POs to GAs

The mapping of POs for both BS programs with GAs is as follows:

- BS Computer Science**

| Sr. #       | POs Description                                                                                                                                                                                                     | GAs           |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| <b>PO 1</b> | <b>Designing Solutions for Complex Problem</b><br>Apply computing knowledge and analytical skills to design innovative solutions for complex and emerging technological challenges                                  | 1, 2, 3, 4, 5 |
| <b>PO 2</b> | <b>Ethical, Professional and Effective Communicator</b><br>Demonstrate professionalism, effective communication skills, ethical values, and the ability to collaborate in multidisciplinary industrial environments | 7, 8, 9       |
| <b>PO 3</b> | <b>Teamwork and Lifelong Learning</b><br>Engage in continuous learning and collaborative teamwork to contribute to technological and societal advancement in alignment with the Sustainable Development Goals       | 6, 10         |

\*The minimum attainment criteria for the KPI are 50%, which is mapped and obtained automatically from the AU CMS.

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*(Signature)*  
(SALMA SARFRAZ)  
Deputy Director, Academic  
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# Scheme of Studies (SoS)

## BS Computer Science

Department of Computer Science  
Faculty of Computing and Artificial Intelligence (FCAI)  
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# BS Computer Science

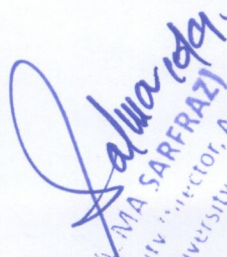
## Revised Curriculum 2026

This document will be implemented w.e.f. Fall-26 and onward batches.

### Generic Structure for Computing Disciplines:

| Area                                | Credit Hours | Courses   |
|-------------------------------------|--------------|-----------|
| General Education Courses (GE)      | 34           | 15        |
| Computer Science Core Courses (CSC) | 48           | 14        |
| Specialization Electives (SE)       | 24           | 08        |
| Professional Certification          | 03           | 01        |
| Internship                          | 03           | 01        |
| Interdisciplinary Courses (IC)      | 12           | 04        |
| Final Year Project (FYP)            | 06           | 03 *      |
| <b>Total</b>                        | <b>130</b>   | <b>46</b> |

\* FYP has 6 Credit Hours and is divided into three semesters.

  
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# Program Structure for BS Computer Science as per HEC revised Computer Science Curriculum 2026

| Computer Science Core Courses (CSC): 48 Credit Hours (14 Courses) |             |                                                                   |                 |           |
|-------------------------------------------------------------------|-------------|-------------------------------------------------------------------|-----------------|-----------|
| Sr. #                                                             | Course Code | Course Title                                                      | Pre-Req         | Cr. Hrs.  |
| 1.                                                                | CS111       | Programming Fundamentals                                          | -               | 3-0-3     |
|                                                                   | CS111L      | Programming Fundamentals Lab                                      | -               | 0-1-1     |
| 2.                                                                | CS112       | Object Oriented Programming                                       | CS111<br>CS111L | 3-0-3     |
|                                                                   | CS112L      | Object Oriented Programming Lab                                   | CS111<br>CS111L | 0-1-1     |
| 3.                                                                | EE223       | Digital Logic Design                                              | -               | 3-0-3     |
|                                                                   | EE223L      | Digital Logic Design Lab                                          | -               | 0-1-1     |
| 4.                                                                | CS230       | Database Systems                                                  | -               | 3-0-3     |
|                                                                   | CS230L      | Database Systems Lab                                              | -               | 0-1-1     |
| 5.                                                                | CS216       | Data Structures                                                   | CS112<br>CS112L | 3-0-3     |
|                                                                   | CS216L      | Data Structures Lab                                               | CS112<br>CS112L | 0-1-1     |
| 6.                                                                | CS415       | Information Security                                              | -               | 3-0-3     |
| 7.                                                                | CS365       | Computer Networks                                                 | -               | 2-0-2     |
|                                                                   | CS365L      | Computer Networks Lab                                             | -               | 0-1-1     |
| 8.                                                                | CS229       | Computer Organization & Architecture                              | EE223<br>EE223L | 2-0-2     |
|                                                                   | CS229L      | Computer Organization & Architecture Lab                          | EE223<br>EE223L | 0-1-1     |
| 9.                                                                | CS225       | Operating Systems                                                 | -               | 3-0-3     |
|                                                                   | CS225L      | Operating Systems Lab                                             | -               | 0-1-1     |
| 10.                                                               | CS332       | Design and Analysis of Algorithms                                 | CS216<br>CS216L | 3-0-3     |
| 11.                                                               | CS344       | Artificial Intelligence                                           | -               | 2-0-2     |
|                                                                   | CS344L      | Artificial Intelligence Lab                                       | -               | 0-1-1     |
| 12.                                                               | CS305       | Software Engineering                                              | -               | 3-0-3     |
| 13.                                                               | CS333       | Theory of Automata                                                | -               | 3-0-3     |
| 14.                                                               | CS481       | Cloud Computing                                                   | -               | 2-0-2     |
|                                                                   | CS481L      | Cloud Computing Lab                                               | -               | 0-1-1     |
|                                                                   |             |                                                                   |                 | <b>48</b> |
| General Education Courses: 34 Credits (15 Courses)                |             |                                                                   |                 |           |
| 1.                                                                | CS181       | Applications of Information and Communication Technologies        | -               | 2-0-2     |
|                                                                   | CS181L      | Applications of Information and Communication Technologies Lab    | -               | 0-1-1     |
| 2.                                                                | EL170       | Functional English                                                | -               | 3-0-3     |
| 3.                                                                | EL271       | Expository Writing                                                | EL170           | 3-0-3     |
| 4.                                                                | MA216       | Quantitative Reasoning (QR-I)<br>i.e. Discrete Structures         | -               | 3-0-3     |
| 5.                                                                | MA301       | Quantitative Reasoning (QR-II)<br>i.e. Probability and Statistics | -               | 3-0-3     |

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|     |        |                                                 |       |           |
|-----|--------|-------------------------------------------------|-------|-----------|
| 6.  | HU124  | Islamic Studies & Ethics                        | -     | 2-0-2     |
| 7.  | HU405  | Ideology and Constitution of Pakistan           | -     | 2-0-2     |
| 8.  | BAXXX  | Arts & Humanities (AH-I)                        | -     | 2-0-2     |
| 9.  | PH111  | Natural Sciences (NS-I) Applied Physics         | -     | 2-0-2     |
|     | PH111L | Natural Sciences (NS-I Lab) Applied Physics Lab | -     | 0-1-1     |
| 10. | XXXXX  | Social Sciences (SS-I)                          | -     | 2-0-2     |
| 11. | HU411  | Civics and Community Engagement                 | -     | 2-0-2     |
| 12. | BA353  | Entrepreneurship                                | -     | 2-0-2     |
| 13. | HU115  | Pakistan Studies                                | -     | 2-0-2     |
| 14. | FQ100  | Fehm-e-Quran I                                  | -     | 0-1-1     |
| 15. | FQ101  | Fehm-e-Quran II                                 | FQ100 | 0-1-1     |
|     |        |                                                 |       | <b>34</b> |

**Interdisciplinary Courses (IC): 12 Credits (4 Courses)**

|    |       |                                              |   |       |
|----|-------|----------------------------------------------|---|-------|
| 1. | MA110 | Calculus and Analytical Geometry (Mandatory) | - | 3-0-3 |
| 2. | MA201 | Linear Algebra (Mandatory)                   | - | 3-0-3 |
| 3. | HU401 | Technical and Business Writing               | - | 3-0-3 |
| 4. | BA235 | Principles of Economics                      | - | 3-0-3 |
| 5. | BA252 | Organizational Behavior                      | - | 3-0-3 |
| 6. | BA406 | E-Commerce & Digital Marketing               | - | 3-0-3 |
| 7. | BM435 | Bioinformatics                               | - | 3-0-3 |
| 8. | PM311 | Project Management                           | - | 3-0-3 |

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| Electives: 24 Credits (08 Courses) |         |                                           |   |       |
|------------------------------------|---------|-------------------------------------------|---|-------|
| 1.                                 | CS284   | Visual Programming                        | - | 2-0-2 |
|                                    | CS284L  | Visual Programming Lab                    | - | 0-1-1 |
| 2.                                 | CS281   | Mobile Computing                          | - | 2-0-2 |
|                                    | CS281L  | Mobile Computing Lab                      | - | 0-1-1 |
| 3.                                 | CS301   | Full stack web development                | - | 2-0-2 |
|                                    | CS301L  | Full stack web development Lab            | - | 0-1-1 |
| 4.                                 | CS485   | Fundamentals of Quantum Communication     | - | 2-0-2 |
|                                    | CS485L  | Fundamentals of Quantum Communication Lab | - | 0-1-1 |
| 5.                                 | CS384   | Quantum Computing                         | - | 2-0-2 |
|                                    | CS384L  | Quantum Computing Lab                     | - | 0-1-1 |
| 6.                                 | CS345   | Digital Image Processing                  | - | 2-0-2 |
|                                    | CS345L  | Digital Image Processing Lab              | - | 0-1-1 |
| 7.                                 | CS402   | Data Science                              | - | 2-0-2 |
|                                    | CS402L  | Data Science Lab                          | - | 0-1-1 |
| 8.                                 | CS323   | Big Data Analytics                        | - | 2-0-2 |
|                                    | CS323L  | Big Data Analytics Lab                    | - | 0-1-1 |
| 9.                                 | CS456   | Natural Language Processing               | - | 2-0-2 |
|                                    | CS456L  | Natural Language Processing Lab           | - | 0-1-1 |
| 10.                                | CS457   | Computer Vision                           | - | 2-0-2 |
|                                    | CS457L  | Computer Vision Lab                       | - | 0-1-1 |
| 11.                                | CS409   | Data Mining                               | - | 2-0-2 |
|                                    | CS409L  | Data Mining Lab                           | - | 0-1-1 |
| 12.                                | CS455   | Deep Learning                             | - | 2-0-2 |
|                                    | CS455L  | Deep Learning Lab                         | - | 0-1-1 |
| 13.                                | CS432   | Distributed Databases                     | - | 2-0-2 |
|                                    | CS432L  | Distributed Databases Lab                 | - | 0-1-1 |
| 14.                                | CS351   | Machine Learning                          | - | 2-0-2 |
|                                    | CS351L  | Machine Learning Lab                      | - | 0-1-1 |
| 15.                                | CS364   | Blockchain                                | - | 2-0-2 |
|                                    | CS364L  | Blockchain Lab                            | - | 0-1-1 |
| 16.                                | CS352   | MLOps                                     | - | 2-0-2 |
|                                    | CS352L  | MLOps Lab                                 | - | 0-1-1 |
| 17.                                | CS426   | Parallel and Distributed Computing        | - | 2-0-2 |
|                                    | CS426L  | Parallel and Distributed Computing Lab    | - | 0-1-1 |
| 18.                                | CSXXX   | Introduction to Data Science              | - | 2-0-2 |
|                                    | CSXXXL  | Introduction to Data Science              | - | 0-1-1 |
| 19.                                | CS271   | Web Technologies                          | - | 2-0-2 |
|                                    | CS271 L | Web Technologies                          | - | 0-1-1 |
| 20.                                | CSXXX   | Human Computer Interface                  | - | 2-0-2 |
|                                    | CSXXXL  | Human Computer Interface                  | - | 0-1-1 |
| 21.                                | CSXXX   | Data Visualization                        | - | 2-0-2 |
|                                    | CSXXXL  | Data Visualization Lab                    | - | 0-1-1 |

\* More specialization courses may be added as per the faculty availability and industry requirement

\* Specialization elective could be offered as (3-0-3) or (2-0-2+0-1-1)

*CS271  
271L*

| Quantitative Reasoning (QR): 6 Credits (2 Courses)                                            |       |                            |   |       |
|-----------------------------------------------------------------------------------------------|-------|----------------------------|---|-------|
| 1.                                                                                            | MA216 | Discrete Structures        | - | 3-0-3 |
| 2.                                                                                            | MA301 | Probability and Statistics | - | 3-0-3 |
| 3.                                                                                            | MA105 | Multivariable Calculus     | - | 3-0-3 |
| 4.                                                                                            | MA421 | Numerical Analysis         | - | 3-0-3 |
| * More QR courses may be added as per the faculty availability or suggested by domain experts |       |                            |   |       |
| Arts & Humanities (AH): 2 Credits (1 Course)                                                  |       |                            |   |       |
| 1.                                                                                            | BA152 | Introduction to Management | - | 2-0-2 |
| 2.                                                                                            | XXXXX | Financial Management       | - | 2-0-2 |
| 3.                                                                                            | PY115 | Introduction to Psychology | - | 2-0-2 |
| Industry Internship                                                                           |       |                            |   |       |
| 1.                                                                                            | CS490 | Internship                 | - | 3-0-3 |

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**Scheme of Studies**  
**BS Computer Science**  
**Applicable from Fall-2026 Intake & Onwards**

**SEMESTER-I**

| Sr. # | Course Code | Course Title                                                   | Pre-Req        | Cr. Hrs.       |
|-------|-------------|----------------------------------------------------------------|----------------|----------------|
| 1.    | EL170       | Functional English                                             | -              | 3-0-3          |
| 2.    | PH111       | Applied Physics                                                | -              | 2-0-2          |
| 3.    | PH111L      | Applied Physics Lab                                            | -              | 0-1-1          |
| 4.    | HU115       | Pakistan Studies                                               | -              | 2-0-2          |
| 5.    | CS181       | Applications of Information and Communication Technologies     | -              | 2-0-2          |
| 6.    | CS181L      | Applications of Information and Communication Technologies Lab | -              | 0-1-1          |
| 7.    | CS111       | Programming Fundamentals                                       | -              | 3-0-3          |
| 8.    | CS111L      | Programming Fundamentals Lab                                   | -              | 0-1-1          |
| 9.    | FQ100       | Fehm-e-Quran I                                                 | -              | 0-1-1          |
| 10.   | MA 114      | * Foundational Mathematics (non-credit)                        | -              | 3-0-3          |
|       |             |                                                                | <b>Cr.Hrs.</b> | <b>12-4-16</b> |
|       |             | *Intermediate without Math Students Only                       |                |                |

**SEMESTER-II**

| Sr. # | Course Code | Course Title                              | Pre-Req         | Cr. Hrs.       |
|-------|-------------|-------------------------------------------|-----------------|----------------|
| 1.    | EL271       | Expository Writing                        | EL170           | 3-0-3          |
| 2.    | CS112       | Object Oriented Programming               | CS111<br>CS111L | 3-0-3          |
| 3.    | CS112L      | Object Oriented Programming Lab           | CS111<br>CS111L | 0-1-1          |
| 4.    | HU411       | Civics and Community Engagement           | -               | 2-0-2          |
| 5.    | EE223       | Digital Logic Design                      | -               | 3-0-3          |
| 6.    | EE223L      | Digital Logic Design Lab                  | -               | 0-1-1          |
| 7.    | XXXXX       | Arts & Humanities (AH-I)                  | -               | 2-0-2          |
| 8.    | FQ101       | Fehm-e-Quran II                           | FQ100           | 0-1-1          |
| 9.    | HU405       | Ideology and Constitution of Pakistan     | -               | 2-0-2          |
| 10.   | MA118       | * Pre-Calculus (non-credit)               | -               | 3-0-3          |
|       |             |                                           | <b>Cr.Hrs.</b>  | <b>15-3-18</b> |
|       |             | * Intermediate without Math Students only |                 |                |

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### SEMESTER-III

| Sr. # | Course Code | Course Title                             | Pre-Req           | Cr. Hrs.       |
|-------|-------------|------------------------------------------|-------------------|----------------|
| 1.    | MA216       | Discrete Structures                      | -                 | 3-0-3          |
| 2.    | CS216       | Data Structures                          | CS112<br>CS112L   | 3-0-3          |
| 3.    | CS216L      | Data Structures Lab                      | CS112<br>CS112L   | 0-1-1          |
| 4.    | CSXXX       | Elective - I                             | -                 | 2-0-2          |
| 5.    | CSXXXL      | Elective Lab - I                         | -                 | 0-1-1          |
| 6.    | MA110       | Calculus and Analytical Geometry         | -                 | 3-0-3          |
| 7.    | CS229       | Computer Organization & Architecture     | EE 223<br>EE223L  | 2-0-2          |
| 8.    | CS229L      | Computer Organization & Architecture Lab | EE 223<br>EE 223L | 0-1-1          |
| 9.    | HU124       | Islamic Studies & Ethics                 | -                 | 2-0-2          |
|       |             |                                          | <b>Cr.Hrs.</b>    | <b>16-2-18</b> |

### SEMESTER-IV

| Sr. # | Course Code | Course Title               | Pre-Req        | Cr. Hrs.       |
|-------|-------------|----------------------------|----------------|----------------|
| 1.    | MA301       | Probability and Statistics | -              | 3-0-3          |
| 2.    | CS230       | Database Systems           | -              | 3-0-3          |
| 3.    | CS230L      | Database Systems Lab       | -              | 0-1-1          |
| 4.    | CS225       | Operating Systems          | -              | 3-0-3          |
| 5.    | CS225L      | Operating Systems Lab      | -              | 0-1-1          |
| 6.    | CSXXX       | Elective - II              | -              | 2-0-2          |
| 7.    | CSXXXL      | Elective Lab - II          | -              | 0-1-1          |
| 8.    | CS305       | Software Engineering       | -              | 3-0-3          |
|       |             |                            | <b>Cr.Hrs.</b> | <b>14-3-17</b> |

### SEMESTER-SUMMER\*

| Sr. # | Course Code | Course Title | Pre-Req | Cr. Hrs. |
|-------|-------------|--------------|---------|----------|
| 1.    | CS490       | Internship   | -       | 3-0-3    |

\* Students can apply for 6-8 weeks supervised internship course

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## SEMESTER-V

| Sr. # | Course Code | Course Title                        | Pre-Req         | Cr. Hrs.       |
|-------|-------------|-------------------------------------|-----------------|----------------|
| 1.    | CS365       | Computer Networks                   | -               | 2-0-2          |
| 2.    | CS365L      | Computer Networks Lab               | -               | 0-1-1          |
| 3.    | CS344       | Artificial Intelligence * Mandatory | -               | 2-0-2          |
| 4.    | CS344L      | Artificial Intelligence Lab         | -               | 0-1-1          |
| 5.    | CSXXX       | Elective-III                        | -               | 2-0-2          |
| 6.    | CSXXXL      | Elective Lab-III                    | -               | 0-1-1          |
| 7.    | CS332       | Design and Analysis of Algorithms   | CS216<br>CS216L | 3-0-3          |
| 8.    | XXXXX       | Social Sciences (SS)                | -               | 2-0-2          |
| 9.    | BA353       | Entrepreneurship                    | -               | 2-0-2          |
|       |             |                                     | <b>Cr.Hrs.</b>  | <b>13-3-16</b> |

## SEMESTER-VI

| Sr. # | Course Code | Course Title               | Pre-Req        | Cr. Hrs.       |
|-------|-------------|----------------------------|----------------|----------------|
| 1.    | MA201       | Linear Algebra             | -              | 3-0-3          |
| 2.    | CS333       | Theory of Automata         | -              | 3-0-3          |
| 3.    | CSXXX       | Elective - IV              | -              | 2-0-2          |
| 4.    | CSXXXL      | Elective Lab - IV          | -              | 0-1-1          |
| 5.    | CSXXX       | Elective -V                | -              | 2-0-2          |
| 6.    | CSXXX       | Elective Lab-V             | -              | 0-1-1          |
| 7.    | XXXXX       | Professional Certification | -              | 3-0-3          |
| 8.    | CS491       | Final Year Project - I     | List A         | 0-1-1          |
|       |             |                            | <b>Cr.Hrs.</b> | <b>13-3-16</b> |

## SEMESTER-SUMMER\*

| Sr. # | Course Code | Course Title | Pre-Req | Cr. Hrs. |
|-------|-------------|--------------|---------|----------|
| 1.    | CS490       | Internship   |         | 3-0-3    |

\* Student who did not avail internship **must** apply for 6-8 weeks supervised internship course

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**SEMESTER-VII**

| Sr. # | Course Code | Course Title                          | Pre-Req        | Cr. Hrs.       |
|-------|-------------|---------------------------------------|----------------|----------------|
| 1.    | XXXXX       | Interdisciplinary Course-III (IC-III) | -              | 3-0-3          |
| 2.    | CSXXX       | Elective -VI                          | -              | 2-0-2          |
| 3.    | CSXXXL      | Elective Lab -VI                      | -              | 0-1-1          |
| 4.    | CSXXX       | Elective-VII                          | -              | 2-0-2          |
| 5.    | CSXXXL      | Elective Lab -VII                     | -              | 0-1-1          |
| 6.    | CS415       | Information Security                  | -              | 3-0-3          |
| 7.    | CS492       | Final Year Project - II               | CS491          | 0-2-2          |
|       |             |                                       | <b>Cr.Hrs.</b> | <b>10-4-14</b> |

**SEMESTER-VIII**

| Sr. # | Course Code | Course Title                        | Pre-Req        | Cr. Hrs.      |
|-------|-------------|-------------------------------------|----------------|---------------|
| 1.    | XXXXX       | Interdisciplinary Course-IV (IC-IV) | -              | 3-0-3         |
| 2.    | CSXXX       | Elective - VIII                     | -              | 2-0-2         |
| 3.    | CSXXXL      | Elective Lab - VIII                 | -              | 0-1-1         |
| 4.    | CS481       | Cloud Computing                     | -              | 2-0-2         |
| 5.    | CS481L      | Cloud Computing Lab                 | -              | 0-1-1         |
| 6.    | CS493       | Final Year Project - III            | CS492          | 0-3-3         |
|       |             |                                     | <b>Cr.Hrs.</b> | <b>7-5-12</b> |
|       |             | <b>Grand Total</b>                  |                | <b>130</b>    |

**List A (Pre-requisites for FYP-I registration)**

| S# | Course Code | Course Title                    | Credit Hours |
|----|-------------|---------------------------------|--------------|
| 1. | CS111       | Programming Fundamentals        | 3-0-3        |
|    | CS111L      | Programming Fundamentals Lab    | 0-1-1        |
| 2. | CS112       | Object Oriented Programming     | 3-0-3        |
|    | CS112L      | Object Oriented Programming Lab | 0-1-1        |
| 3. | CS216       | Data Structures                 | 3-0-3        |
|    | CS216L      | Data Structures Lab             | 0-1-1        |
| 4. | CS230       | Database Systems                | 3-0-3        |
|    | CS230L      | Database Systems Lab            | 0-1-1        |
| 5. | CS305       | Software Engineering            | 3-0-3        |
| 6. | CS225       | Operating Systems               | 3-0-3        |
|    | CS225L      | Operating Systems Lab           | 0-1-1        |

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