

Faculty of Engineering  
School of Information, Security and Data Science  
Department of Information Technology

Degree: B. Tech. Computer Science and Engineering (Cyber Security)

Total Credits: 160

Annexure II

| Third Semester   |                                                      |          |   |   |    | Fourth Semester |                                                      |          |   |    |    |
|------------------|------------------------------------------------------|----------|---|---|----|-----------------|------------------------------------------------------|----------|---|----|----|
| Code             | Subject Name                                         | L        | T | P | C  | Code            | Subject Name                                         | L        | T | P  | C  |
| MEE22XX          | Engineering Economics                                | 3        | 0 | 0 | 3  | MAS21XX         | Statistics & Probability                             | 3        | 0 | 0  | 3  |
| MBB21XX          | Management of Technology                             | 3        | 0 | 0 | 3  | ICS2201         | Operating Systems                                    | 3        | 1 | 0  | 4  |
| ICS2101          | Computer System Architecture                         | 3        | 0 | 0 | 3  | ICS2202         | Relational Database Management Systems               | 3        | 0 | 0  | 3  |
| ICS2102          | Data Structures and Algorithms                       | 3        | 1 | 0 | 4  | ICS2240         | Number Theory and Cryptography                       | 3        | 1 | 0  | 4  |
| ICS2103          | Cyber Security Essentials                            | 3        | 1 | 0 | 4  | ICS2220         | Data Communication and Networks                      | 3        | 1 | 0  | 4  |
| ICS2120          | Object-Oriented Programming                          | 3        | 0 | 0 | 3  | XXXXX           | Open Elective 1                                      | 3        | 0 | 0  | 3  |
| ICS2130          | Data Structures and Algorithms Lab                   | 0        | 0 | 2 | 1  | ICS2230         | Relational Database Management Systems Lab           | 0        | 0 | 2  | 1  |
| ICS2131          | Object-Oriented Programming Lab                      | 0        | 0 | 2 | 1  | ICS2231         | Operating Systems Lab                                | 0        | 0 | 2  | 1  |
| ICS 2132         | Cyber Security Essentials Lab                        | 0        | 0 | 2 | 1  | ICS2232         | Data Communication and Networks Lab                  | 0        | 0 | 2  | 1  |
| ICS2170          | Project-based Learning 1                             | 0        | 0 | 2 | 1  | ICS2270         | Project-based Learning 2                             | 0        | 0 | 2  | 1  |
|                  | Total                                                | 18       | 3 | 6 | 24 |                 | Total                                                | 18       | 3 | 8  | 25 |
|                  | Total Contact Hours (L+T+P)                          | 27 Hours |   |   |    |                 | Total Contact Hours (L+T+P)                          | 29 Hours |   |    |    |
| Fifth Semester   |                                                      |          |   |   |    | Sixth Semester  |                                                      |          |   |    |    |
| Code             | Subject Name                                         | L        | T | P | C  | Code            | Subject Name                                         | L        | T | P  | C  |
| ICS3101          | Design and Analysis of Algorithms                    | 3        | 1 | 0 | 4  | ICS3201         | Information and Network Security                     | 3        | 1 | 0  | 4  |
| ICS3102          | Vulnerability Assessment and Penetration Testing     | 3        | 1 | 0 | 4  | ICS3240         | Machine Learning for Cyber Security [PE4]            | 3        | 0 | 0  | 3  |
| ICS3120          | Artificial Intelligence for Cyber Security           | 3        | 1 | 0 | 4  | XXXXXX          | Program Elective 5                                   | 3        | 0 | 0  | 3  |
| XXXXXX           | Program Elective 2                                   | 3        | 0 | 0 | 3  | XXXXXX          | Program Elective 6                                   | 3        | 0 | 0  | 3  |
| XXXXXX           | Program Elective 3                                   | 3        | 0 | 0 | 3  | XXXXXX          | Open Elective 3                                      | 3        | 0 | 0  | 3  |
| XXXXXX           | Open Elective 2                                      | 3        | 0 | 0 | 3  | ICS3210         | Professional Practice                                | 0        | 0 | 0  | 1  |
| ICS3130          | Design and Analysis of Algorithms Lab                | 0        | 0 | 2 | 1  | ICS3230         | Information and Network Security Lab                 | 0        | 0 | 2  | 1  |
| ICS3131          | Vulnerability Assessment and Penetration Testing Lab | 0        | 0 | 2 | 1  | ICS3231/ICS3232 | Digital Forensics Lab / Web Application Security Lab | 0        | 0 | 2  | 1  |
| ICS3170          | Project-based Learning 3                             | 0        | 0 | 2 | 1  | ICS3270         | Project-based Learning 4                             | 0        | 0 | 6  | 3  |
|                  | Total                                                | 18       | 3 | 6 | 24 |                 | Total                                                | 15       | 1 | 10 | 22 |
|                  | Total Contact Hours (L+T+P)                          | 27 Hours |   |   |    |                 | Total Contact Hours (L+T+P)                          | 26 Hours |   |    |    |
| Seventh Semester |                                                      |          |   |   |    | Eighth Semester |                                                      |          |   |    |    |
| Code             | Subject Name                                         | L        | T | P | C  | Code            | Subject Name                                         | L        | T | P  | C  |
| XXXXXX           | Program Elective 7                                   | 3        | 0 | 0 | 3  | ICS4270         | Major Project                                        | 0        | 0 | 0  | 12 |
| XXXXXX           | Program Elective 8                                   | 3        | 0 | 0 | 3  |                 |                                                      |          |   |    |    |
| XXXXXX           | Open Elective 4                                      | 3        | 0 | 0 | 3  |                 |                                                      |          |   |    |    |
| XXXXXX           | Open Elective 5                                      | 3        | 0 | 0 | 3  |                 |                                                      |          |   |    |    |
| ICS4170          | Internship (Industry or Research)                    | 0        | 0 | 0 | 1  |                 |                                                      |          |   |    |    |
|                  | Total                                                | 12       | 0 | 0 | 13 |                 | Total                                                | 0        | 0 | 0  | 12 |
|                  | Total Contact Hours (L+T+P)                          | 12 Hours |   |   |    |                 | Total Contact Hours (L+T+P)                          |          |   |    |    |

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**A. Core Courses**

- |                                                                |                |
|----------------------------------------------------------------|----------------|
| 1. ICS 2101 : Computer System Architecture                     | (Semester III) |
| 2. ICS 2102 : Data Structures and Algorithms                   | (Semester III) |
| 3. ICS 2103 : Cyber Security Essentials                        | (Semester III) |
| 4. ICS 2201 : Operating Systems                                | (Semester IV)  |
| 5. ICS 2202 : Relational Database Management Systems           | (Semester IV)  |
| 6. ICS 3101 : Design and Analysis of Algorithms                | (Semester V)   |
| 7. ICS 3102 : Vulnerability Assessment and Penetration Testing | (Semester V)   |
| 8. ICS 3201 : Information and Network Security                 | (Semester VI)  |

**B. Flexible Core Courses**

- |                                                                            |                |
|----------------------------------------------------------------------------|----------------|
| 1. Flexible Core 1 : ICS 2120 : Object-Oriented Programming                | (Semester III) |
| 2. Flexible Core 2 : ICS 2220 : Data Communications and networks           | (Semester IV)  |
| 3. Flexible Core 3 : ICS 3120 : Artificial Intelligence for Cyber Security | (Semester IV)  |

**C. Program Electives**

| Program Electives                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Semester IV                                                                                                              | Semester V                                                                                                                                                                                                                                                                                                                                                                        | Semester VI                                                                                                                                                                                                                                                                                                                                                                                                                             | Semester VII                                                                                                                                                                                                                                                                                                                                                  |
| <b>Program Elective 1</b><br><ul style="list-style-type: none"> <li>ICS 2240 : Number Theory and Cryptography</li> </ul> | <b>Program Elective 2</b><br><ul style="list-style-type: none"> <li>ICS 3140 : IoT Security</li> <li>ICS 3141 : Block Chain Technologies</li> <li>ICS 3142 : Theory of Computation</li> </ul> <b>Program Elective 3</b><br><ul style="list-style-type: none"> <li>ICS 3143 : Secure Coding</li> <li>ICS 3144 : Cloud Security</li> <li>ICS 3145 : Software Engineering</li> </ul> | <b>Program Elective 4</b><br><ul style="list-style-type: none"> <li>ICS 3240 : Machine Learning for Cyber Security</li> </ul> <b>Program Elective 5</b><br><ul style="list-style-type: none"> <li>ICS 3242 : Digital Forensics</li> <li>ICS 3243 : Web Application Security</li> </ul> <b>Program Elective 6</b><br><ul style="list-style-type: none"> <li>ICS 3244 : Database Security</li> <li>ICS 3245 : Android Security</li> </ul> | <b>Program Elective 7</b><br><ul style="list-style-type: none"> <li>ICS 4140 : Quantum Computing and Security</li> <li>ICS 4141 : Cyber Laws and Polices</li> </ul> <b>Program Elective 8</b><br><ul style="list-style-type: none"> <li>ICS 4142 : Deep Learning</li> <li>ICS 4143 : Soft Computing Techniques</li> <li>ICS 4144 : Compiler Design</li> </ul> |

<sup>i</sup> Statistics & Probability: CSE, AIML, SEEC students will take in 3<sup>rd</sup> semester. Engineering Economics: SIT, SCCE, All Core (-) SEEC will take in 3<sup>rd</sup> semester. In 4<sup>th</sup> semester, these courses are switched.