# UNIVERSITY SCHOOL
# OF
# INFORMATION AND COMMUNICATION TECHNOLOGY

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

## PROGRAMME STRUCTURE

## B.TECH. COMPUTER SCIENCE AND ENGINEERING

## SPECIALIZATION : CYBER SECURITY
## 2024-2028



# GAUTAM BUDDHA UNIVERSITY
# GAUTAM BUDH NAGAR, GREATER NOIDA, UP, INDIA

## SEMESTER I

| S.No. | Course Code | Course Name | L | T | P | Credits | Types |
|-------|-------------|-------------|---|---|---|---------|-------|
| 1 | MA101 | Engineering Mathematics-I | 3 | 1 | 0 | 4 | GE1 |
| 2 | PH102 | Engineering Physics | 3 | 1 | 0 | 4 | GE2 |
| 3 | CS101 | Fundamentals of Computer Programming | 3 | 1 | 0 | 4 | CC1 / FC |
| 4 | CC102 | Introduction to Cyber Security | 2 | 0 | 0 | 2 | CC2 / FC |
| 5 | EC101 | Basic Electronics Engineering | 3 | 1 | 0 | 4 | GE3/FC |
| 6 | EN101 | English Proficiency | 2 | 0 | 0 | 2 | OE1 / AECC |
| 7 | CE103 | Engineering Graphics Lab | 1 | 0 | 2 | 2 | GE-L1 |
| 8 | PH104 | Engineering Physics Lab | 0 | 0 | 2 | 1 | GE-L2 |
| 9 | CS181 | Computer Programming Lab | 0 | 0 | 2 | 1 | CC-L1 / SEC |
| 10 | EC181 | Basic Electronics Engineering Lab | 0 | 0 | 2 | 1 | GE-L3 |
| 11 | GP | General Proficiency | Non Credit | | | | |
| | | **Total Hours and Credits** | **17** | **4** | **8** | **25** | |

## SEMESTER II

| S.No. | Course Code | Course Name | L | T | P | Credits | Types |
|-------|-------------|-------------|---|---|---|---------|-------|
| 1 | MA102 | Engineering Mathematics-II | 3 | 1 | 0 | 4 | GE4 |
| 2 | EE102 | Basic Electrical Engineering | 3 | 1 | 0 | 4 | GE5 |
| 3 | ME101 | Engineering Mechanics | 3 | 1 | 0 | 4 | GE6 |
| 4 | ES101 | Environmental Studies | 3 | 1 | 0 | 4 | OE2 / AECC |
| 5 | CS102 | Computer Organistaion and Architecture | 3 | 1 | 0 | 4 | CC3 |
| 6 | EE104 | Basic Electrical Engineering Lab | 0 | 0 | 2 | 1 | GE-L4 |
| 7 | EN151 | Language Lab | 0 | 0 | 2 | 1 | OE-L1 / SEC |
| 8 | ME102 | Workshop Practice | 1 | 0 | 2 | 2 | GE-L5 |
| 9 | CC182 | Cyber Security Lab | 0 | 0 | 2 | 1 | CC-L2/SEC |
| 10 | GP | General Proficiency | Non Credit | | | | |
| | | **Total Hours and Credits** | **16** | **5** | **8** | **25** | |

## SEMESTER III

| S.No. | Course Code | Course Name | L | T | P | Credits | Types |
|-------|-------------|-------------|---|---|---|---------|-------|
| 1 | CC201 | Internet Technology | 3 | 0 | 0 | 3 | CC4 / SEC |
| 2 | CC203 | Operating Systems | 3 | 0 | 0 | 3 | CC5 |
| 3 | CC205 | Data Structure & Algorithms | 3 | 0 | 0 | 3 | CC6 / SEC |
| 4 | CC207 | Introduction to Python | 3 | 0 | 0 | 3 | CC7 |
| 5 | CC209 | Cyber Security Law and Standards | 3 | 0 | 0 | 3 | CC8 |
| 6 | MA201 | Engineering Mathematics-III | 3 | 1 | 0 | 4 | GE7 |
| 7 | CC281 | Internet Technology Lab | 0 | 0 | 3 | 2 | CC-L3 |
| 8 | CC283 | Data Structure & Algorithms Lab | 0 | 0 | 3 | 2 | CC-L4 / SEC |
| 9 | CC285 | Python Programming Lab | 0 | 0 | 3 | 2 | CC-L5 / SEC |
| 10 | GP | General Proficiency | Non Credit | | | | |
| | | **Total Hours and Credits** | **18** | **1** | **9** | **25** | |

## SEMESTER IV

| S.No. | Course Code | Course Name | L | T | P | Credits | Types |
|-------|-------------|-------------|---|---|---|---------|-------|
| 1 | CC202 | Software Engineering | 3 | 0 | 0 | 3 | CC9 |
| 2 | CC204 | Database Management System | 3 | 0 | 0 | 3 | CC10 / SEC |
| 3 | CC206 | Java Programming | 3 | 0 | 0 | 3 | CC11 |
| 4 | CC208 | Artificial Intelligence | 3 | 0 | 0 | 3 | CC12 |
| 5 | CC210 | Theory of Automata | 3 | 0 | 0 | 3 | CC13 |
| 6 | CC212 | Biometric Security | 3 | 1 | 0 | 4 | CC14 / SEC |
| 7 | CC282 | Database Management System Lab | 0 | 0 | 3 | 2 | CC-L6 / SEC |
| 8 | CC284 | Java Programming Lab | 0 | 0 | 3 | 2 | CC-L7 / SEC |
| 9 | CC286 | Biometric Security Lab | 0 | 0 | 3 | 2 | CC-L8 / SEC |
| 10 | GP | General Proficiency | Non Credit | | | | |
| | | **Total Hours and Credits** | **18** | **1** | **9** | **25** | |

## SEMESTER V

| S.No. | Course Code | Course Name | L | T | P | Credits | Types |
|-------|-------------|-------------|---|---|---|---------|-------|
| 1 | CC301 | Compiler Design | 3 | 1 | 0 | 4 | CC15 / AECC |
| 2 | CC303 | Soft Computing Techniques | 3 | 0 | 0 | 3 | CC16 |
| 3 | CC305 | Analysis and Design of Algorithms | 3 | 0 | 0 | 3 | CC17 / SEC |
| 4 | CC307 | Cryptography and Data Privacy | 3 | 0 | 0 | 3 | CC18 |
| 5 | CC309 | Machine Learning | 3 | 1 | 0 | 4 | CC19 / SEC |
| 6 | | Elective 1 | 3 | 0 | 0 | 3 | E1 / DSE |
| 7 | CC381 | Analysis and Design of Algorithms Lab | 0 | 0 | 3 | 2 | CC-L9 / SEC |
| 8 | CC383 | Cryptography and Data Privacy Lab | 0 | 0 | 3 | 2 | CC-L10 / SEC |
| 9 | CC385 | Machine Learning Lab | 0 | 0 | 3 | 2 | CC-L11 / SEC |
| 10 | GP | General Proficiency | Non Credit | | | | |
| | | **Total Hours and Credits** | **18** | **2** | **9** | **26** | |

## SEMESTER VI

| S.No. | Course Code | Course Name | L | T | P | Credits | Types |
|-------|-------------|-------------|---|---|---|---------|-------|
| 1 | CC302 | Web Development using PHP | 3 | 0 | 0 | 3 | CC20 |
| 2 | CC304 | Computer Networks | 3 | 0 | 0 | 3 | CC21 |
| 3 | CC306 | Cloud Computing | 3 | 1 | 0 | 4 | CC22 |
| 4 | CC308 | Digital Forensic, Audit and Investigations | 3 | 0 | 0 | 3 | CC23 |
| 5 | CC310 | Data Privacy and Database Security | 3 | 0 | 0 | 3 | CC24 / SEC |
| 6 | | Elective 2 | 3 | 0 | 0 | 3 | E2 / DSE |
| 7 | CC382 | Web Development using PHP Lab | 0 | 0 | 3 | 2 | CC-L12 / SEC |
| 8 | CC384 | Computer Networks lab | 0 | 0 | 3 | 2 | CC-L13 |
| 9 | CC386 | Data Privacy and Database Security Lab | 0 | 0 | 3 | 2 | CC-L14 |
| 10 | GP | General Proficiency | Non Credit | | | | |
| | | **Total Hours and Credits** | **18** | **1** | **9** | **25** | |

**Industrial Training** will be done by candidate individually after third year during the summer break and it will be of minimum 4 weeks. It will be evaluated as per University Examination in VII semester.

## SEMESTER VII

| S.No. | Course Code | Course Name | L | T | P | Credits | Types |
|---|---|---|---|---|---|---|---|
| 1 | CC401 | Parallel Processing and CUDA Programming | 3 | 1 | 0 | 4 | CC25 |
| 2 | CC403 | Blockchain Technology | 3 | 0 | 0 | 3 | CC26 |
| 3 | CC405 | AI Enabled Cyber Security | 2 | 0 | 0 | 2 | CC27 / SEC |
| 4 | | Elective 3 | 3 | 0 | 0 | 3 | E3 / DSE |
| 5 | | Elective 4 | 3 | 0 | 0 | 3 | E4 / DSE |
| 6 | CC481 | AI Enabled Cyber Security Lab | 0 | 0 | 3 | 2 | CC-L15 |
| 7 | CC491 | Minor Project | 0 | 0 | 10 | 5 | MP1 / E |
| 8 | CC493 | Industrial Traning | 0 | 0 | 6 | 3 | IT1 / E |
| 9 | GP | General Proficiency | Non Credit | | | | |
| | | **Total Hours and Credits** | 14 | 1 | 19 | 25 | |

## SEMESTER VIII

| S.No. | Course Code | Course Name | L | T | P | Credits | Types |
|---|---|---|---|---|---|---|---|
| 1 | CC490 | Seminar | 0 | 0 | 3 | 2 | S / E |
| 2 | CC492 | Major Project | 0 | 0 | 16 | 8 | MP2 / E |
| 3 | CC494 | Internship | 0 | 0 | 30 | 15 | I / E |
| 4 | GP | General Proficiency | Non Credit | | | | |
| | | **Total Hours and Credits** | 0 | 0 | 49 | 25 | |

### GRAND  TOTAL OF CREDITS    =    201

In the **Seminar**, student need to study and present individually, on latest research paper of their specialized area and It will be evaluated as per University Examination Rules.

The **Internship** in Industry will be done  by candidate individually during the 8th semester and it will be for a minimum of 4 to 6  months. It will be evaluated as per University Examination Rules.

**Minor and Major Project** will be in a group and It will be evaluated as per University Examination Rules.

USICT will provide a mentor/supervisor for industrial training, seminar, internship, minor and major projects.

**ELECTIVES FROM DCSE**

| S.No. | Course Code | Course Name | L | T | P | Credits | Types |
|---|---|---|---|---|---|---|---|
| 1 | CC311 | Security Information & Event Management | 3 | 0 | 0 | 3 | E1 |
| 2 | CC313 | Intrusion Detection and Prevention System | 3 | 0 | 0 | 3 | E1 |
| 3 | CC315 | Cryptography | 3 | 0 | 0 | 3 | E1 |
| 4 | CC317 | Biometric System and Security | 3 | 0 | 0 | 3 | E1 |
| 5 | CC319 | Ethical Hacking | 3 | 0 | 0 | 3 | E1 |
| 6 | CC312 | Mobile Security | 3 | 0 | 0 | 3 | E2 |
| 7 | CC314 | Cloud Architecture and Security | 3 | 0 | 0 | 3 | E2 |
| 8 | CC316 | Principle of Secure Coding | 3 | 0 | 0 | 3 | E2 |
| 9 | CC318 | Information Warfare | 3 | 0 | 0 | 3 | E2 |
| 10 | CC320 | Social Network Security | 3 | 0 | 0 | 3 | E2 |
| 11 | CC407 | Physical Security of IT Infrastructure | 3 | 0 | 0 | 3 | E3 |
| 12 | CC409 | NISTA 800-53 (Security Control) | 3 | 0 | 0 | 3 | E3 |
| 13 | CC411 | Operating Systems Security | 3 | 0 | 0 | 3 | E3 |
| 14 | CC413 | Mobile and Wireless Network Security | 3 | 0 | 0 | 3 | E3 |
| 15 | CC415 | Enterprise Security and Management | 3 | 0 | 0 | 3 | E3 |
| 16 | CC417 | Malware Analysis | 3 | 0 | 0 | 3 | E4 |
| 17 | CC419 | Android Security Design and Internals | 3 | 0 | 0 | 3 | E4 |
| 18 | CC421 | Data and Database Management Security | 3 | 0 | 0 | 3 | E4 |
| 19 | CC423 | Web Application and Penetration Testing | 3 | 0 | 0 | 3 | E4 |
| 20 | CC425 | Access Control and Identity Management Systems | 3 | 0 | 0 | 3 | E4 |

| | | | |
|---|---|---|---|
| **CC** | Computer Science & Engineering / Cyber Security for Course Code | **SEC** | Skill Enhancement Course |
| **CC** | Core Course from USICT for Type of Course | **E** | Elective from USICT |
| **GE** | General Elective from related discipline of other Deptt./School | **CC-L** | Core Course Lab from USICT |
| **GE L** | General Elective Lab from related discipline of other Deptt./School | **IT1** | Industrial Training |
| **OE** | Open Elective  from other discipline of other Deptt./School | **MP** | Minor / Major Project |
| **AECC** | Ability Enhancement Compulsary Course | **S** | Seminar |
| **DSE** | Discipline Specific Course | **I** | Internship |