# HINDUSTAN
## INSTITUTE OF TECHNOLOGY & SCIENCE
### (DEEMED TO BE UNIVERSITY)

**DEPARTMENT OF COMPUTER APPLICATIONS**

**B.C.A-Bachelor of Computer Applications**
**Specialization in**
**Database Systems/Multimedia and Animation**

**(3 YEARS)**

**Under Choice Based Credit system**

**(In line with NEP 2020)**

**CURRICULUM and SYLLABUS**

**Regulation 2023**

**(Applicable for Students admitted from Academic Year 2023-2024)**

**DEPARTMENT OF COMPUTER APPLICATIONS**

**SCHOOL OF COMPUTING SCIENCES**

# HINDUSTAN INSTITUTE OF TECHNOLOGY & SCIENCE
# VISION AND MISSION

**Motto:**

To Make Every Man a Success and No Man a Failure

**Vision:**

To be an International Institute of Excellence, providing a conducive environment for education with a strong emphasis on innovation, quality, research and strategic partnership blended with values and commitment to society.

**Mission:**

- To create an ecosystem that promotes learning and world class research.
- To nurture creativity and innovation.
- To install highest ethical standards and values.
- To pursue activities for the development of the Society.
- To develop national and international collaborations with institutes and industries of eminence.
- To enable graduates to become future leaders and innovators.

**Value Statement:**

Integrity, Innovation, Internationalization.

# DEPARTMENT OF COMPUTER APPLICATIONS

# VISION AND MISSION

**VISION**

The department of Computer Applications aims to transform graduates into software experts with high degree of technical skill and to encourage students towards research.

**MISSION**

- To establish a strong foundation of industrial, R&D and academic collaborations for training andresearch.

- To provide strong theoretical foundation complemented with extensive practicaltraining.

- To design and deliver curriculum to meet the changing the needs ofindustry.

- To promote all round personality development of the students through interaction with alumni, academia andindustry.

# B.C.A(Bachelor of Computer Applications)

## PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

The Program Educational Objectives (PEOs) are defined and developed for each program with the consultation and involvement of various stakeholders such as management, students, industry, regulating authorities, alumni, faculty and parents. Their interests, social relevance and contributions are taken into account in defining and developing thePEOs.

The Program Educational Objectives (**PEOs)** of the **Computer Applications** are listed below:

**PEOI**      To provide students with a strong foundation in the Mathematical, Scientific and Engineering fundamentals necessary to formulate, solve and analyse engineering problems and to prepare them for graduate studies,R&D.

**PEO II** To provide exposure to cutting edge technologies with adequate training and opportunities to work as teams on multidisciplinary projects with effective communication skills, ethics and leadership qualities.

**PEO III**To prepare the students for a successful career in IT and ITES industries with effective Institute-IndustryInteraction.

**PEO IV** To inculcate the desire for lifelong learning and contribute to the society and introduce them the bestpractices.

## PROGRAM OUTCOMES (ALIGNED WITH GRADUATE ATTRIBUTES) (PO)

Upon the completion of the Programme, the graduates will be able to:

**PO1- Critical Thinking:** Make assumptions, validate and appreciate them from different perspectives.

**PO2-Effective Communication**: Develop key communication skills inclusive of electronic mode to participate in diverse areas.

**PO3-Social Interaction:** Invite views of others for a harmonious coexistence.

**PO4-Effective Citizenship:** Sympathize and be sensitive to issues and participate in civic life to show empathy for social concerns.

**PO5-Ethics:** Recognize and appreciate value systems to make appropriate decisions in diverse situations.

**PO6-Environment and sustainability:** Understand environmental issues and work towards sustainable development.

**PO7-Self Directed and Life Long Learning:** Engage in lifelong learning by adopting appropriate technology.

# PROGRAM SPECIFIC OUTCOMES (PSO)

## B.C.A- Bachelor of Computer Applications (General)

At the end of this program, graduates will be able to execute the outcomes defined by Professional body.

**PSO1:** Impart the basic knowledge and conceptual understanding of Computing Systems through mathematical and analytical skills.

**PSO2**: Analyse a problem, identify the computing requirements and using procedures find a solution

**PSO3:** Improve the analytical knowledge of the through innovative system design using modern tools and techniques as a team.

# PROGRAM SPECIFIC OUTCOMES (PSO)

## B.C.A- Bachelor of Computer Applications
## Specialization in Database Systems

At the end of this program, graduates will be able to execute the outcomes defined by Professional body.

**PSO1:** Impart the basic knowledge and conceptual understanding of ComputingSystems through mathematical and analytical skills.

**PSO2**: Associate the learning from the courses related to Databases, Operating Systems, Data Structures, and Programming Languages to arrive at solutions to real world problems

**PSO3:** Design and develop database systems used for storing digital data in real world applications

# PROGRAM SPECIFIC OUTCOMES (PSO)

**B.C.A- Bachelor of Computer Applications**
**Specialization in Multimedia and Animations**

At the end of this program, graduates will be able to execute the outcomes defined by Professional body.

**PSO1:**     Acquire multiple skills that will enhance their employability in different segments of Animation, Gaming and Entertainment industry.

**PSO2:** Develop competence in the fields of Computer Graphics assets creation, Visual Effects, Gaming and Graphic designing

**PSO3:** Apply acquired knowledge in the field of multimedia in practice and independently continue to expand knowledge in this field.

# PROGRAM SPECIFIC OUTCOMES (PSO)

**B.C.A- Bachelor of Computer Applications**
**Specialization in Cyber Security**

At the end of this program, graduates will be able to execute the outcomes defined by Professional body.

**PSO1:**     Assess cyber security risk management policies in order to protect organizations critical information.

**PSO2:**     Ability to formulate, update and communicate short- and long-term organization cyber security strategies and policies

**PSO3**:   Improve the analytical knowledge of the students to design a cyber security model to secure the data using modern tools and techniques.

| BCA General/Multimedia/Database Control Copy  2023-24 | | | | | | 2023 Regulation | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (126 CREDIT STRUCTURE) | | | | | | | | | | | |
| SEMESTER I | | | | | | | | | | | |
| S.No | COURSE CATEGORY | COURSE TYPE | SEM | COURSE CODE | NAME OF THE COURSE | L | T | P | C | S | TCH |
| 1 | CC | TH | I | ACA31002 | Computer Fundamentals and Organization | 2 | 1 | 0 | 3 | 2 | 3 |
| 2 | CC | TP | I | ACA31003 | Problem Solving Techniques | 2 | 0 | 2 | 3 | 2 | 4 |
| 3 | CC | TP | I | ACA31004 | Data Structures | 2 | 1 | 2 | 4 | 2 | 5 |
| 4 | BS | TH | I | GMA31001 | Mathematics for Computer Science | 3 | 1 | 0 | 4 | 2 | 4 |
| 5 | HS | TP | I | GLS51001 | Communication Skills | 2 | 0 | 1 | 2 | 1 | 3 |
| 6 | HS | TP | I | GLS11001 | Tamil Art and Culture | 1 | 0 | 1 | 1 | 2 | 2 |
| 7 | VA | TH | I | GGE51003 | Environmental Science and Sustainable Development | 2 | 0 | 0 | 2 | 2 | 2 |
| 8 | HS | PR | I | GBP01400 | Health and Wellbeing | | | | | | |
| 9 | VA | PR | I | GPE21401 | Yoga | 0 | 0 | 2 | 1 | 2 | 2 |
| | | | | GPE21402 | Sports | | | | | | |
| | | | | GPE21403 | Fitness | | | | | | |
| | | | | AVC31401 | Fine Arts | | | | | | |
| 10 | HS | PR | I | GGE51401 | Outreach (NCC)-Level-I | | | | | | |
| | | | | GGE51402 | Outreach (NSS-Y's men, Rotaract)-Level-I | | | | | | |
| 11 | NC | TP | I | ASS21001 | Community Development | 1 | 0 | 1 | * | 2 | 2 |
| Total | | | | | | 15 | 3 | 9 | 20 | 17 | 27 |

**L – Lecture; T – Tutorial; P – Practical; C – Credit; S- Self Study; TCH- Total Contact Hours ; *- Non Credit Course**

| SEMESTER II | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S.No | COURSE CATEGORY | COURSE TYPE | SEM | COURSE CODE | NAME OF THE COURSE | L | T | P | C | S | TCH |
| 1 | CC | TP | II | ACA31005 | Object Oriented Programming | 2 | 0 | 2 | 3 | 2 | 4 |
| 2 | CC | TP | II | ACA31006 | Database Management Systems | 2 | 0 | 2 | 3 | 2 | 4 |
| 3 | CC | TP | II | ACA31007 | Multimedia Systems | 2 | 0 | 2 | 3 | 2 | 4 |
| 4 | CC | TH | II | ACA31008 | Operating Systems | 2 | 1 | 0 | 3 | 2 | 3 |
| 5 | HS | TP | II | GLS51002 | Personality | 2 | 0 | 1 | 2 | 1 | 3 |

| S.No | COURSE CATEGORY | COURSE TYPE | SEM | COURSE CODE | NAME OF THE COURSE | L | T | P | C | S | TCH |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Development and Soft Skills | | | | | | |
| 6 | AE | TP | II | ACA31001 | Digital Technological Solutions | 2 | 0 | 2 | 3 | 2 | 4 |
| 7 | HS | TH | II | GLS51008 | Tamil | 2 | 0 | 0 | 2 | 2 | 2 |
| | | | | GLS51009 | Hindi | | | | | | |
| | | | | GLS51010 | Telugu | | | | | | |
| | | | | GLS11002 | Advanced Tamil | | | | | | |
| 8 | HS | PR | II | GBP01400 | Health and Wellbeing | 0 | 0 | 2 | 1 | 2 | 2 |
| 9 | VA | PR | II | GPE21401 | Yoga | | | | | | |
| | | | | GPE21402 | Sports | | | | | | |
| | | | | GPE21403 | Fitness | | | | | | |
| | | | | AVC31401 | Fine Arts | | | | | | |
| 10 | HS | PR | II | GGE51401 | Outreach (NCC)-Level-I | | | | | | |
| | | | | GGE51402 | Outreach (NSS-Y's men, Rotaract)-Level-I | | | | | | |
| | | | | | **Total** | **14** | **1** | **11** | **20** | **15** | **26** |

**L – Lecture; T – Tutorial; P – Practical; C – Credit; S- Self Study; TCH- Total Contact Hours**

| SEMESTER III | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S.No | COURSE CATEGORY | COURSE TYPE | SEM | COURSE CODE | NAME OF THE COURSE | L | T | P | C | S | TCH |
| 1 | CC | TP | III | ACA31010 | Computer Networks | 3 | 1 | 0 | 4 | 2 | 4 |
| 2 | CC | TP | III | ACA31009 | Full Stack WEB Development | 3 | 0 | 2 | 4 | 2 | 5 |
| 3 | DE | TP | III | ** | Department Elective-1 | 2 | 0 | 2 | 3 | 2 | 4 |
| 4 | NE | TP | III | *** | Non-Department Elective | 2 | 0 | 2 | 3 | 2 | 4 |
| 5 | HS | TH | III | GLS51011 | French | 2 | 0 | 0 | 2 | 2 | 2 |
| | | | | GLS51012 | German | | | | | | |
| | | | | GLS51013 | Spanish | | | | | | |
| | | | | GLS51014 | Korean | | | | | | |
| | | | | GLS51015 | Mandarin | | | | | | |
| | | | | GLS51016 | Japanese | | | | | | |
| 6 | HS | TP | III | GLS51005 | Public Speaking | 1 | 0 | 1 | 1 | 1 | 2 |
| 7 | HS | TP | III | GLS51006 | English for Competitive Examinations | 1 | 0 | 1 | 1 | 1 | 2 |
| 8 | NC | TH | III | GGE51015 | Indian Knowledge System | 3 | 0 | 0 | * | 2 | 3 |
| 9 | NC | TP | III | ABB31001 | CSR & SDG | 1 | 0 | 2 | * | 2 | 3 |
| 10 | SI | IN | III | ACA31800 | Internship# | # | # | # | 4 | # | # |

| | | | | Total | 18 | 1 | 10 | 22 | 16 | 29 |
|---|---|---|---|---|---|---|---|---|---|---|

**L – Lecture; T – Tutorial; P – Practical; C – Credit; S- Self Study; TCH- Total Contact Hours;**
**\*\* - Department Elective; \*\*\*- Non Department Elective**

**#15 days of Internship carrried out in the end of SEM II and evaluated in the SEM III**

| SEMESTER IV | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S.No | COURSE CATEGORY | COURSE TYPE | SEM | COURSE CODE | NAME OF THE COURSE | L | T | P | C | S | TCH |
| 1 | CC | TP | IV | ACA31011 | Software Engineering | 2 | 1 | 2 | 4 | 2 | 5 |
| 2 | CC | TH | IV | ACA31015 | E-Commerce Technologies | 3 | 0 | 0 | 3 | 2 | 3 |
| 3 | CC | TP | IV | ACA31012 | Mobile Application Development | 2 | 0 | 2 | 3 | 2 | 4 |
| 4 | CC | TH | IV | ACA31014 | Digtial Marketing | 3 | 0 | 0 | 3 | 2 | 3 |
| 5 | SE | TP | IV | ACM31001 | Accounting Tools | 1 | 0 | 2 | 2 | 2 | 3 |
| 6 | DE | TP | IV | \*\* | Department Elective-2 | 2 | 0 | 2 | 3 | 2 | 4 |
| 7 | HS | TH | IV | GLS11003 | French Intermediate | 2 | 0 | 0 | 2 | 2 | 2 |
| | | | | GLS11004 | German Intermediate | | | | | | |
| | | | | GLS11005 | Spanish Intermediate | | | | | | |
| | | | | GLS11006 | Korean Intermediate | | | | | | |
| | | | | GLS11007 | Mandarin Intermediate | | | | | | |
| | | | | GLS11008 | Japanese Intermediate | | | | | | |
| | | | | | Total | 15 | 1 | 8 | 20 | 14 | 24 |

**L – Lecture; T – Tutorial; P – Practical; C – Credit; S- Self Study; TCH- Total Contact Hours ;\*\*- Department Elective-2**

| SEMESTER V | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S.No | COURSE CATEGORY | COURSE TYPE | SEM | COURSE CODE | NAME OF THE COURSE | L | T | P | C | S | TCH |
| 1 | CC | TP | V | ACA31016 | Fundamentals of Dataware Housing and Data Mining | 3 | 0 | 2 | 4 | 2 | 5 |
| 2 | CC | TH | V | ACS11011 | Artificial Intelligence | 3 | 1 | 0 | 4 | 2 | 4 |
| 3 | CC | TP | V | ACA31013 | Cyber Security | 3 | 0 | 2 | 4 | 2 | 5 |
| 4 | CC | TP | V | AGE21001 | Fundamentals of Research Methodology | 3 | 0 | 2 | 4 | 2 | 5 |
| 5 | DE | TP | V | \*\* | Department Elective-3 | 2 | 0 | 2 | 3 | 2 | 4 |
| 6 | HS | TP | V | GLS51007 | Verbal Reasoning and Interview Skills | 1 | 0 | 1 | 1 | 1 | 2 |
| 7 | NC | TH | V | AGE31001 | Methodology for Writing a Professional & Scientific Article | 1 | 0 | 0 | \* | 2 | 1 |
| | | | | | Total | 16 | 1 | 9 | 20 | 13 | 26 |

**L – Lecture; T – Tutorial; P – Practical; C – Credit; S- Self Study; TCH- Total Contact Hours ; \*\*- Department Elective-3**

| | | | | SEMESTER VI | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| S.No | COURSE CATEGORY | COURSE TYPE | SEM | COURSE CODE | NAME OF THE COURSE | L | T | P | C | S | TCH |
| 1 | CC | TH | VI | ACA31017 | IoT Applications | 3 | 1 | 0 | 4 | 2 | 4 |
| 2 | CC | TH | VI | ACA31018 | Web Services in Cloud Computing | 3 | 1 | 0 | 4 | 2 | 4 |
| 3 | CC | TH | VI | ACA31019 | Data Analytics and Visualization | 3 | 1 | 0 | 4 | 2 | 4 |
| 4 | DE | TP | VI | ** | Department Elective-4 | 2 | 0 | 2 | 3 | 2 | 4 |
| 5 | NC | TH | VI | GGE51011 | Introduction to Women and Gender Studies | 3 | 0 | 0 | * | 2 | 3 |
| 6 | HS | TH | VI | GGE51001 | Universal Human Values | 2 | 0 | 0 | 2 | 2 | 2 |
| 7 | RP | PJ | VI | ACA31801 | Project | 0 | 0 | 14 | 7 | 4 | 14 |
| | | | | | **Total** | **16** | **3** | **16** | **24** | **16** | **35** |

**L – Lecture; T – Tutorial; P – Practical; C – Credit; S- Self Study; TCH- Total Contact Hours;\*\*- Department Elective-4**

| LIST OF DEPARTMENT ELECTIVES | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **DEPARTMENT ELECTIVE-1** | | | | | | | | | | |
| S.No. | COURSE CATEGORY | COURSE TYPE | SEM | COURSE CODE | NAME OF THE COURSE | L | T | P | C | S | TCH |
| 1 | DE | TP | III | ACA31500 | MATLAB Programming | 2 | 0 | 2 | 3 | 2 | 4 |
| 2 | DE | TP | III | ACA31501 | User Interface Design | 2 | 0 | 2 | 3 | 2 | 4 |
| 3 | DE | TP | III | ACA31502 | Graphic Design | 2 | 0 | 2 | 3 | 2 | 4 |
| 4 | DE | TP | III | ACA31503 | Digital Media and Visual Effects | 2 | 0 | 2 | 3 | 2 | 4 |
| 5 | DE | TP | III | ACA31504 | Advanced Database Technologies | 2 | 0 | 2 | 3 | 2 | 4 |
| 6 | DE | TP | III | ACA31505 | Data Science Tools | 2 | 0 | 2 | 3 | 2 | 4 |

| **DEPARTMENT ELECTIVE-2** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | DE | TP | IV | ACA31508 | Software Modeling Architecture | 2 | 0 | 2 | 3 | 2 | 4 |
| 2 | DE | TP | IV | ACA31509 | Information Security | 2 | 0 | 2 | 3 | 2 | 4 |
| 3 | DE | TP | IV | ACA31510 | 2-D Animation & Editing | 2 | 0 | 2 | 3 | 2 | 4 |
| 4 | DE | TP | IV | ACA31511 | 3-D Architectural Visualization & Visual FX | 2 | 0 | 2 | 3 | 2 | 4 |

| 5 | DE | TP | IV | ACA31512 | Data Modelling & Integration | 2 | 0 | 2 | 3 | 2 | 4 |
| 6 | DE | TP | IV | ACA31513 | Databases in R Programming | 2 | 0 | 2 | 3 | 2 | 4 |

| | | | | **DEPARTMENT ELECTIVE-3** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | DE | TP | V | ACA31516 | Agile Software Development | 2 | 0 | 2 | 3 | 2 | 4 |
| 2 | DE | TP | V | ACA31517 | Computer vision | 2 | 0 | 2 | 3 | 2 | 4 |
| 3 | DE | TP | V | ACA31518 | Advanced 3-D Animation | 2 | 0 | 2 | 3 | 2 | 4 |
| 4 | DE | TP | V | ACA31519 | Game Programming | 2 | 0 | 2 | 3 | 2 | 4 |
| 5 | DE | TP | V | ACA31520 | Applied Data Science | 2 | 0 | 2 | 3 | 2 | 4 |
| 6 | DE | TP | V | ACA31521 | Data Engineering Foundations | 2 | 0 | 2 | 3 | 2 | 4 |

| | | | | **DEPARTMENT ELECTIVE-4** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | DE | TP | VI | ACA31522 | Software Quality Management | 2 | 0 | 2 | 3 | 2 | 4 |
| 2 | DE | TP | VI | ACA31523 | Block Chain Technology | 2 | 0 | 2 | 3 | 2 | 4 |
| 3 | DE | TP | VI | ACA31524 | Augmented and Virtual Reality | 2 | 0 | 2 | 3 | 2 | 4 |
| 4 | DE | TP | VI | ACA31525 | Cartoon Animation and Special Effects | 2 | 0 | 2 | 3 | 2 | 4 |
| 5 | DE | TP | VI | ACA31526 | Data Analysis | 2 | 0 | 2 | 3 | 2 | 4 |
| 6 | DE | TP | VI | ACA31527 | Data Vizualization | 2 | 0 | 2 | 3 | 2 | 4 |
| L – Lecture; T – Tutorial; P – Practical; C – Credit; S- Self Study; TCH- Total Contact Hours | | | | | | | | | | | |

| | | | | **NON-DEPARTMENT ELECTIVES** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **S.No.** | **COURSE CATEGORY** | **COURSE TYPE** | **SEMESTER** | **COURSE CODE** | **NAME OF THE COURSE** | | **T** | **P** | **C** | **S** | **TCH** |
| 1 | NE | TP | III | ACA31700 | Digital Marketing | 2 | 0 | 2 | 3 | 2 | 4 |