KANNUR UNIVERSITY
കണ്ണൂർ സർവകലാശാല

**(Abstract)**

FYUG B.Sc. Data Analytics Programme - Scheme (full) and syllabus (1-2 semesters) -Approved & Implemented 2025 admission - Orders Issued

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**ACADEMIC C SECTION**

ACAD C/ACAD C3/8508/2019 (I) Dated: 24.12.2025

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Read:-1. U.O. No. ACAD A/ ACADA2/13731/2024 dated: 18/06/2025

2. U.O No. ACAD/ACAD C3/8508/2019 dated: 04/07/2025

3. Email dated, 27.10.2025 of Dr .N.S. Sreekanth, Convenor of the Expert Committee

4. Email dated, 05.11.2025 of Dean, Faculty of Technology

5.Minutes of the meeting of the Standing Committee of Academic Council held on 05/12/2025

6..Orders of Vice Chancellor in the even file dated 24.12.2025

**ORDER**

1. As per paper read (1) above, Provisional Affiliation was granted to the B.Sc. Data Analytics Programme at Don Bosco Arts and Science College, Angadikadavu, during the academic year 2024–25, with permission to admit students in the academic year 2025–26.

2. As per paper read (2) above, an Expert Committee was constituted for the preparation of syllabi and fixing the eligibility criteria for the FYUG B.Sc. Cyber Security and B.Sc.Data Analytics Programmes.

3.Vide paper read 3 above, Dr.N.S. Sreekanth, Convenor of the Expert Committee constituted for the preparation of syllabi and fixing the eligibility criteria for the FYUG B.Sc. Cyber Security and B.Sc. Data Analytics Programmes submitted the scheme (full) and Syllabus (1-2 semesters) of the FYUG B.Sc. Data Analytics Programme for approval and implementation 2025 admission .

4. The submitted Scheme and Syllabi were forwarded to the Dean, Faculty of Technology for remarks and the Dean vide paper read (4) recommended to approve the same.

5. Considering the matter, the Vice Chancellor has ordered to place the scheme (full) and Syllabus (1-2 semesters) of the FYUG B.Sc. Data Analytics Programme (2025 admission), submitted by the Convenor of the Expert Committee constituted for the preparation of syllabi and fixing the eligibility criteria for the FYUG B.Sc. Cyber Security and B.Sc.Data Analytics Programmes before the Standing Committee of the Academic Council for consideration .

6.The meeting of the Standing Committee of the Academic Council held on 05/12/2025 recommended to approve the above Scheme and Syllabi of the FYUG B.Sc. Data Analytics

Programme.

7.The Vice Chancellor after considering the recommendation of the Standing Committee of the Academic Council and in exercise of the powers of the Academic Council conferred under Section 11(1) Chapter III of the Kannur University Act, 1996 and all other enabling provisions read together with has approved the scheme (full) and Syllabus (1-2 semesters) of the FYUG B.Sc. Data Analytics Programme for implementation w.e.f 2025 admission), subject to reporting to the Academic Council.

8.The approved Scheme and Syllabus are appended with this U.O. and uploaded in the University site

Orders are issued accordingly.

*Sd/-*

**Bindu K P G**

**DEPUTY REGISTRAR (ACADEMIC)**

For REGISTRAR

To: 1. The Controller of Examinations (Through PA)
2. The Principals of Affiliated colleges offering the FYUG B.Sc.Data Analytics Programme
3.The Convenor, Expert Committee
4. The Chairperson, Board of Studies in Computer Science (UG)

Copy To: 1. PA to CE (to circulate the same among the sections concerned under Examination Branch)
2. PS to VC/PA to R
3. JR II /EXC I/ EG I/ AR VII (Exam)
4. DR/AR (Academic)
5. Web Manager (to upload on the website)
6. Computer Programmer
7. SF/DF/FC

Forwarded / By Order

SECTION OFFICER

KANNUR UNIVERSITY
CIVIL STATION P.O.
KANNUR
Pin-670 002
THAVAKKARA

**Kannur University**

# CURRICULUM

# SYLLABUS

# OF

# FOUR YEARS UNDER GRADUATE PROGRAMME(FYUGP)

# B. Sc. DATA ANALYTICS

## CURRICULUM & SYLLABUS

**Effective from 2025 Admission onwards**

**Prepared By**

# PROGRAMME OUTCOME

| | |
|---|---|
| **PO1** | **Critical Thinking and Problem-Solving**-Apply critical thinking skills to analyze information and develop effective problem-solving strategies for tackling complex challenges. |
| **PO2** | **Effective Communication and Social Interaction**-Proficiently express ideas and engage in collaborative practices, fostering effective interpersonal connections. |
| **PO3** | **Holistic Understanding**-Demonstrate a multidisciplinary approach by integrating knowledge across various domains for a comprehensive understanding of complex issues. |
| **PO4** | **Citizenship and Leadership**-Exhibit a sense of responsibility, actively contribute to the community, and showcase leadership qualities to shape a just and inclusive society |
| **PO5** | **Global Perspective**-Develop a broad awareness of global issues and an understanding of diverse perspectives, preparing for active participation in a globalized world. |
| **PO6** | **Ethics, Integrity and Environmental Sustainability**-Uphold high ethical standards in academic and professional endeavours, demonstrating integrity and ethical decision-making. Also acquire an understanding of environmental issues and sustainable practices, promoting responsibility towards ecological well-being |

# PROGRAMME SPECIFIC OUTCOMES

| | |
|---|---|
| **PSO1** | **Abstract Thinking-** Develop the ability to understand and apply abstract concepts in Computer Science and Data Analytics that form the foundation of various data-driven theories and technologies. |
| **PSO2** | **Problem Solving Approach -** Develop the skill to identify the problem, formulate a hypothesis and draw conclusions involving large, diverse data sets from different application domains. |
| **PSO3** | **Analytical and Design Ability -** Perform data analysis using the concepts and interpret them to design them |
| **PSO4** | **Computational & Programming Proficiency-** Demonstrate proficiency in programming languages (C, Python, R, Java) and tools for database management, web technologies, cloud, and big data platforms to solve real-world problems. |
| **PSO5** | **Domain-Specific Analytics**: Apply data analytics techniques in specialized domains such as IoT, social media, business, marketing, recommender systems, and network analysis to provide practical solutions. |

**Eligibility for Admission:**

Basic qualifications: Candidate must possess

1) Pass with 50% marks or equivalent grade at 10+2 level or equivalent

AND

2) Mathematics / Statistics / Computer Science / Computer Application / Informatics Practices as one of the subjects at 10+2 level.

## STRUCTURE OF THE PROGRAMME

The Programme of instruction will consist of Lecture courses, Practical courses, comprehensive Viva-voce, Seminar, internship/ industrial visit, and Project work.

1. **Lecture courses:** Courses involving lectures relating to a field or discipline by a faculty member.

2. **Tutorial courses:** Courses involving problem-solving and discussions relating to a field or discipline under the guidance of qualified personnel in a field of learning.

3. **Laboratory work:** A course requiring students to participate in a project or practical or lab activity that applies previously learned/studied principles/theory related to the chosen field of learning, work/vocation, or professional practice under the supervision of an instructor.

4. **Comprehensive Viva-voce:** This is an essential assessment included in the Programme to evaluate the student's grasp of the subject matter and their ability to apply their knowledge as defined in the course outcomes. It also provides an opportunity for the student to engage in academic discussions and receive valuable feedback from experts in the field.

5. **Seminar:** A course requiring students to participate in structured discussion/conversation or debate focused on assigned tasks/readings, current or historical events, or shared experiences guided or led by an expert or qualified personnel in a field of learning

6. **Internship/ Industrial/ Institutional Visit**: All students shall undergo a Field Trip/Summer Internship/Apprenticeship in a Firm, Industry or Organization; or Training in labs with faculty and researchers or other Higher Education Institutions (HEIs) or research institutions.
   Departments can actively promote internships that can eventually lead to research project work. Institutional visit Incorporating institutional or industrial visits in the Programme brings immense value to the students, making their learning journey more enriching and preparing them for successful careers in Computer science-related fields.

7. **Research Project:** These students who have opted for the honours with research should complete a research project under the guidance of the mentor and should submit a research report for evaluation. They need to successfully defend the research project to obtain 12 credits under a faculty member of the University/College. The research shall be in the Major discipline

# Kannur University
# B.Sc. Data Analytics

| Sl.No. | Categorization of Courses for all Programs | Minimum Number of Credit required | |
|---|---|---|---|
| | | 3Year UG | 4Year UG |
| 1 | Major (Core) | 68 | 88* |
| 2 | Minor | 24 | 36 |
| 3 | Multi-Disciplinary | 9 | 9 |
| 4 | Skill Enhancement Courses (SEC) | 9 | 9 |
| 5 | Ability Enhancement Course (AEC) | 12 | 12 |
| 6 | Value Added Courses Common for all UG | 9 | 9 |
| 7 | Summer Internship, Field Based. Learning etc. | 2 | 2 |
| 8 | Research Project/Dissertation | | 12 |
| | **Total Credits** | **133** | **177** |
| | | | |

| **COURSES** | **CREDITS** | **SEMESTERS** |
|---|---|---|
| Major / Minor Stream (DSC/DSE) | 92 (4 Credit Courses) | Within all Six Semesters |
| Multidisciplinary Courses (MDC) | 9 (3 Credit Three Courses) | Semester 1 to 6 |
| Skill Enhancement Courses (SEC) | 9 (3 Credits Three Courses) | Semester 1 to 6 |
| Value Addition Courses (VAC) | 9 (3 Credits Three Courses) | Semester 1 to 6 |
| Ability Enhancement Courses (AEC) | 12 (3 Credits 4 Courses) | Semester 1and 2 |
| Internship / Field Visit | 2 (2 Credit Courses) | Semester 1 to 6 |
| **Total credits for first six semesters** | **133** | |

| **COURSES** | **CREDITS** | **SEMESTERS** |
|---|---|---|
| Major / Minor Stream (DSC/DSE) | 24 (4 Credit Courses) | Semester 7 |
| Additional DSC / DSE for Honours (in Major discipline) | 12 Credits (2 DSC and 1 DSE in the Major) | Semester 8 |
| Project | 12 Credits | Semester 8 |
| MOOC / ONLINE COURSES (Blended Mode) | 8 (4 Credits 2 Courses) | Semester 7 and 8 |
| **Total Credits for Semester 7 and 8** | **44*** | |

*For Honours with Research 12 Credits Project in Semester 8 and for Honours additional 12 credits DSC / DSE in Semester 8 which should include Capstone level courses

*AEC- Ability Enhancement Course, DSC- Discipline Specific Course, SEC- Skill Enhancement Course, VAC- Value Added Course, DSE- Discipline Specific Elective

# COURSE STRUCTURE

## SEMESTER: I

| Course Code | Title of the Course | Credit | Hours/ Week | Hour Distribution /Week | | | | Marks |
|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | O | |
| **DISCIPLINE SPECIFIC COURSES(DSC)** | | | | | | | | |
| KU1DSCDAS101 | Fundamentals of IT and Computers | 4 | 4 | 4 | | 0 | | 100 |
| KU1DSCDAS102 | Emerging Technologies in Information Technology | 4 | 4 | 4 | | 0 | | 100 |
| KU1DSCDAS103 | Multimedia and Software Applications | 4 | 5 | 3 | | 2 | | 100 |
| **MULTI DISCIPLINARY COURSE(MDC)** | | | | | | | | |
| KU1MDCDAS101 | Computer Fundamentals | 3 | 3 | 3 | | 0 | | 75 |

L — Lecture, T — Tutorial, P — Practical / Practicum, O — Others

AEC- Ability Enhancement Course, DSC- Discipline Specific Course, SEC- Skill Enhancement Course, VAC- Value Added Course, DSE- Discipline Specific Elective

## SEMESTER: II

| Course Code | Title of the Course | Credit | Hours / Week | Hour Distribution / Week | | | | Marks |
|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | O | |
| **DISCIPLINE SPECIFIC COURSES(DSC)** | | | | | | | | |
| KU2DSCDAS104 | Python Programming | 4 | 5 | 3 | | 2 | | 100 |
| KU2DSCDAS105 | Fundamentals of Web Programming | 4 | 5 | 3 | | 2 | | 100 |
| KU2DSCDAS106 | Content Management System and WordPress | 4 | 5 | 3 | | 2 | | 100 |
| KU2DSCDAS107 | Internet Technology | 4 | 4 | 4 | | 0 | | 100 |
| **MULTI DISCIPLINARY COURSES(MDC)** | | | | | | | | |
| KU2MDCDAS102 | Data Analysis Using Excel | 3 | 3 | 3 | | 0 | | 75 |
| KU2MDCDAS103 | Introduction to Digital Marketing | 3 | 3 | 3 | | 0 | | 75 |

## SEMESTER: III

| Course Code | Title of the Course | Credit | Hours/ Week | Hour Distribution / Week | | | | Marks |
|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | O | |
| **DISCIPLINE SPECIFIC COURSES(DSC)** | | | | | | | | |
| KU3DSCDAS201 | Object Oriented Programming Through Java | 4 | 5 | 3 | | 2 | | 100 |
| KU3DSCDAS202 | Fundamentals of Data Analytics | 4 | 4 | 4 | | 0 | | 100 |
| KU3DSCDAS203 | Basics of Artificial Intelligence | 4 | 4 | 4 | | 0 | | 100 |
| KU3DSCDAS204 | E-Commerce | 4 | 4 | 4 | | 0 | | 100 |
| KU3DSCDAS205 | Web Designing Using HTML5 | 4 | 5 | 3 | | 2 | | 100 |
| **VALUE ADDED COURSES(VAC)** | | | | | | | | |
| KU3VACDAS201 | Professional Skill Development for IT Career Excellence | 3 | 3 | 3 | | 0 | | 75 |
| KU3VACDAS202 | Free and Open-Source Softwares | 3 | 3 | 3 | | 0 | | 75 |

## SEMESTER: IV

| Course Code | Title of the Course | Credit | Hours/ Week | Hour Distribution / Week | | | | Marks |
|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | O | |
| **DISCIPLINE SPECIFIC COURSES(DSC)** | | | | | | | | |
| KU4DSCDAS207 | Data Structures using Python | 4 | 5 | 3 | | 2 | | 100 |
| KU4DSCDAS208 | Database Management System | 4 | 5 | 3 | | 2 | | 100 |
| KU4DSCDAS209 | Operating System | 4 | 4 | 4 | | 0 | | 100 |
| KU4INTDAS211 | Internship (Credit will be added in the 6$^{th}$ semester) | 0 | | | | | | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **SKILL ENHANCEMENT COURSES(SEC)** | | | | | | | | |
| KU4SECDAS201 | Introduction to Git | 3 | 3 | 2 | | 1 | | 75 |
| KU4SECDAS202 | Programming in C | 3 | 3 | 2 | | 1 | | 75 |
| **VALUE ADDED COURSES(VAC)** | | | | | | | | |
| KU4VACDAS203 | Web Scraping and Text Mining | 3 | 3 | 3 | | 0 | | 75 |
| KU4VACDAS204 | Advanced Excel for Data Analytics | 3 | 4 | 3 | | 1 | | 75 |
| KU4VACDAS205 | Linux Operating System and Shell Programming | 3 | 4 | 3 | | 1 | | 75 |
| KU4VACDAS206 | Introduction to Google Tools | 3 | 3 | 3 | | 0 | | 75 |

## SEMESTER: V

| **Course Code** | **Title of the Course** | **Credit** | **Hours/ Week** | **Hour Distribution / Week** | | | | **Marks** |
|---|---|---|---|---|---|---|---|---|
| | | | | **L** | **T** | **P** | **O** | |
| **DISCIPLINE SPECIFIC COURSES(DSC)** | | | | | | | | |
| KU5DSCDAS301 | Fundamentals of Internet of Things | 4 | 4 | 4 | | 0 | | 100 |
| KU5DSCDAS302 | Data Mining and Warehousing | 4 | 4 | 4 | | 0 | | 100 |
| KU5DSCDAS303 | Advanced Python Programming | 4 | 5 | 3 | | 2 | | 100 |
| KU5DSCDAS304 | Software Engineering | 4 | 4 | 4 | | 0 | | 100 |
| **DISCIPLINE SPECIFIC ELECTIVES(DSE)** | | | | | | | | |
| KU5DSEDAS301 | Big Data Analytics | 4 | 4 | 4 | | 0 | | 100 |
| KU5DSEDAS302 | Fundamentals of Machine Learning | 4 | 4 | 4 | | 0 | | 100 |
| KU5DSEDAS303 | Data Visualization | 4 | 4 | 4 | | 0 | | 100 |
| KU5DSEDAS304 | Computer Networks | 4 | 4 | 4 | | 0 | | 100 |
| **SKILL ENHANCEMENT COURSES(SEC)** | | | | | | | | |
| KU5SECDAS301 | Data Visualization Using Tableau and Power BI | 3 | 3 | 2 | | 1 | | 75 |
| KU5SECDAS302 | Introduction to NO-SQL Database | 3 | 3 | 2 | | 1 | | 75 |

**Any two DSE Courses in Semester V.**

## SEMESTER: VI

| Course Code | Title of the Course | Credit | Hours/ Week | Hour Distribution / Week | | | | Marks |
|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | O | |
| **DISCIPLINE SPECIFIC COURSES(DSC)** | | | | | | | | |
| KU6DSCDAS305 | Text Mining and Natural Language Processing | 4 | 4 | 4 | | 0 | | 100 |
| KU6DSCDAS306 | R Programming | 4 | 5 | 3 | | 2 | | 100 |
| KU6DSCDAS307 | Software Design and Implementation | 4 | 5 | 3 | | 2 | | 100 |
| **DISCIPLINE SPECIFIC ELECTIVES(DSE)** | | | | | | | | |
| KU6DSEDAS305 | Deep Learning | 4 | 4 | 4 | | 0 | | 100 |
| KU6DSEDAS306 | Machine Learning Algorithms | 4 | 4 | 4 | | 0 | | 100 |
| KU6DSEDAS307 | Text and Speech Analytics | 4 | 4 | 4 | | 0 | | 100 |
| KU6DSEDAS308 | Digital Image Processing | 4 | 4 | 4 | | 0 | | 100 |
| **INTERNSHIP** | | | | | | | | |
| KU4INTDAS211 | Internship | 2 | | | | | | 50 |
| **SKILL ENHANCEMENT COURSES(SEC)** | | | | | | | | |
| KU6SECDAS303 | Python Frameworks with Django | 3 | 4 | 3 | | 1 | | 75 |
| KU6SECDAS304 | Big Data Technologies using Hadoop | 3 | 4 | 3 | | 1 | | 75 |

**Any two DSE Courses in Semester VI.**

## SEMESTER: VII

| Course Code | Title of the Course | Credit | Hours/ Week | Hour Distribution /Week | | | | Marks |
|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | O | |
| **DISCIPLINE SPECIFIC COURSES(DSC)** | | | | | | | | |
| KU7DSCDAS401 | IoT Analytics | 4 | 4 | 4 | | 0 | | 100 |
| KU7DSCDAS402 | Cloud Computing | 4 | 4 | 4 | | 0 | | 100 |
| KU7DSCDAS403 | Business Analytics | 4 | 5 | 3 | | 2 | | 100 |
| KU7DSCDAS404 | Complex Network Analysis | 4 | 5 | 5 | | 0 | | 100 |
| KU7DSCDAS405 | Soft Computing | 4 | 5 | 5 | | 0 | | 100 |
| KU7DSCDAS406 | Recommender Systems | 4 | 5 | 3 | | 2 | | 100 |
| KU7DSCDAS407 | Seminar / Paper Presentation | 4 | 4 | 4 | | 0 | | 100 |

**Any 5 DSC Courses in Semester 7**

## SEMESTER: VIII

# DEGREE WITH RESEARCH

| Course Code | Title of the Course | Credit | Hour/ week | Hour Distribution/Week | | | | Marks |
|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | O | |
| **DISCIPLINE SPECIFIC COURSES(DSC)** | | | | | | | | |
| KU8DSCDAS408 | Research Methodology | 4 | 4 | 4 | | 0 | | 100 |
| KU8DSCDAS409 | Research Publication and Ethics | 4 | 4 | 4 | | 0 | | 100 |
| KU8DSCDAS410 | Paper Presentation in National or International Conferences | 4 | 4 | 4 | | 0 | | 100 |
| KU8DSCDAS411 | Research Project | 12 | 12 | | | | | 300 |

## SEMESTER: VIII

# DEGREE WITH HONOUR

| Course Code | Title of the Course | Credit | Hours/ week | Hour Distribution /Week | | | | Marks |
|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | O | |
| **DISCIPLINE SPECIFIC COURSES(DSC)** | | | | | | | | |
| KU8DSCDAS412 | SEMINAR | 4 | 4 | | | | | 100 |
| KU8DSCDAS413 | RESEARCH PROJECT(OPTIONAL) | 8 | 4 | | | | | 200 |
| | Total Credit | **12** | | | | | | |
| Three Courses from Any Discipline Major, Minor, DSC, DSE or any discipline of Credit 4(Capstone Level Courses) | | | | | | | | |
| KU8DSCDAS414 | Social Media Analytics | 4 | 4 | 4 | | 0 | | 100 |
| KU8DSCDAS415 | Marketing Analytics | 4 | 4 | 4 | | 0 | | 100 |
| KU8DSCDAS416 | Predictive Analytics | 4 | 4 | 4 | | 0 | | 100 |
| **DISCIPLINE SPECIFIC ELECTIVES(DSE)** | | | | | | | | |
| KU8DSEDAS417 | Cloud Computing for Data Analytics | 4 | 4 | 4 | | 0 | | 100 |
| KU8DSEDAS418 | MOOC/ ONLINE COURSE | | | 4 | | | | |
| | | | | | | | | |
| Total Credit for Semester 8 | | 24 | | | | | | |
| Total Credit for Semester 1 to 6 | | 133 | | | | | | |
| Total Credit for Semester 7 and Semester 8 | | 44 | | | | | | |
| Total Credits from Semester 1 To Semester 8 | | 177 (133+44) | | | | | | |

## ASSESSMENT AND EVALUATION

- The assessment shall be a combination of Continuous Comprehensive Assessment (CCA) and an End Semester Evaluation (ESE).
- As per the regulation of Kannur University, one credit corresponds to 25 marks. Hence a 3-credit course must be evaluated for 75 marks and 4 credit courses for 100 marks. The ratio of continuous comprehensive assessment (CCA) to End semester examination (ESE) for theory/lecture courses is 30:70 and for the practical courses, it is 40:60.
- The 4-credit courses (Major and Minor courses) and 3 credit (Foundational Courses) are of two types:

(i) courses with only theory

(ii) courses with 3-credit theory and 1-credit practical.

- In 4-credit courses with only theory component, out of the total 5 modules of the syllabus, one teacher specific module with 20% content is designed by the faculty member teaching that course, and it is internally evaluated.
- In 4-credit courses with 3-credit theory and 1-credit practical components, out of the total 5 modules of the syllabus, 4 modules are for theory and the fifth module is for practical.
- The 3 credit courses (Foundational Courses) are of two types:
  (i) courses with only theory

  (ii) courses with 2-credit theory and 1-credit practical.

- In 3-credit courses with only theory component, out of the total 5 modules of the syllabus, one teacher specific module with 20% content is designed by the faculty member teaching that course, and it is internally evaluated.
- In 3-credit courses with 2-credit theory and 1-credit practical components, out of the total 5 modules of the syllabus, 4 modules are for theory and the fifth module is for practical.
- Continuous Evaluation includes assignments, seminars, periodic written examinations, or other measures as proposed in the syllabus and approved by the university.

**Practical exams**

- The end-semester practical examination and viva-voce, and the evaluation of practical records shall be conducted by the course in-charge and an internal examiner appointed by the Department Council. Duration of ESE may be 2 to 2.5 Hrs.

- There shall be a Continuous Evaluation of practical courses conducted by the Course- In-Charge.
- The process of continuous evaluation of practical courses shall be completed before 10 days from the commencement of the end-semester examination.
- Those who passed in continuous evaluation alone will be permitted to appear for the end semester examination and viva-voce.

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**Mark Distribution for Discipline Specific Courses and Foundation Courses**

| COURSE CREDIT | CREDIT | | MARK | | L | | P | | |
|---|---|---|---|---|---|---|---|---|---|
| 4 | L | P | L | P | CCA (30%) | ESE (70%) | CCA (40%) | ESE (60%) | TOTAL MARK |
| | 4 | 0 | 100 | 0 | 30 | 70 | 0 | 0 | 100 |
| | 3 | 1 | 75 | 25 | 25 | 50 | 10 | 15 | 100 |
| 3 | L | P | L | P | CCA (30%) | ESE (70%) | CCA (40%) | ESE (60%) | TOTAL MARK |
| | 3 | 0 | 75 | 0 | 25 | 50 | 0 | 0 | 75 |
| | 2 | 1 | 50 | 25 | 15 | 35 | 15 | 10 | 75 |

L – Lecture/Theory, P – Practical/Practicum components, CCA – Continuous Comprehensive Assessment, ESE – End Semester Evaluation.

## The detailed distribution table with the components

- **4 Credit Course (Theory only)**

| EVALUATION TYPE | | MARKS |
|---|---|---|
| **ESE** | | **70** |
| **CCA** | | **30** |
| a) | *Test Paper | 10 |
| b) | **Assignment/Book Article Review | 10 |
| C) | Seminar/Viva-Voce | 10 |
| **TOTAL** | | 100 |

- **4 Credit Course (3 credit theory + 1 credit practical)**

| EVALUATION TYPE | | | MARKS | EVALUATION TYPE | | | MARKS | TOTAL |
|---|---|---|---|---|---|---|---|---|
| **LECTURE** | | | **75** | **PRACTICAL** | | | **25** | **100** |
| **a)** | **ESE** | | **50** | **a)** | **ESE** | | **15** | |
| **b)** | **CCA** | | **25** | **b)** | **CCA** | | **10** | |
| | i | *Test Paper | 10 | | i | Punctuality | 3 | |
| | ii | **Assignment/Book Article Review | 10 | | ii | Model Exam | 4 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | iii | Seminar/Viva-Voce | 5 | | iii | Record | 3 | |

**• 3 Credit Course (Theory only)**

| **EVALUATION TYPE** | | **MARKS** |
|---|---|---|
| ESE | | 50 |
| CCA | | 25 |
| a) | *Test Paper | 10 |
| b) | **Assignment/Book Article Review | 5 |
| C) | Seminar/Viva-Voce | 10 |
| **TOTAL** | | 75 |

- **3 Credit Course (2 credit theory + 1 credit practical)**

| **EVALUATION TYPE** | | | **MARKS** | **EVALUATION TYPE** | | | **MARKS** | TOTAL |
|---|---|---|---|---|---|---|---|---|
| **LECTURE** | | | **50** | **PRACTICAL** | | | **25** | |
| a) | ESE | | 35 | a) | ESE | | 15 | |
| b) | CCA | | 15 | b) | CCA | | 10 | |
| | I | *Test Paper | 8 | | i | Punctuality | 3 | 100 |
| | ii | **Assignment/Book Article Review | 2 | | ii | Model Exam | 4 | |
| | iii | Seminar/Viva-Voce | 5 | | iii | Record | 3 | |

* Best out of two test papers

** Or any other evaluation technique like quiz, open book exam, group activity.

# INTERNSHIP

- All students should undergo Internship of 2-credits during the first six semesters in a firm, industry or organization, or training in labs with faculty and researchers of their own institution or other Higher Educational Institutions (HEIs) or research institutions.
- Internship can be for enhancing the employability of the student or for developing the research aptitude.
- Internship can involve hands-on training on a particular skill/ equipment/ software. It can be a short project on a specific problem or area. Attending seminars or workshops related to an area of learning or skill can be a component of Internship.
- A faculty member/ scientist/ instructor of the respective institution, where the student does the Internship, should be the supervisor of the Internship.

## Guidelines for Internship

- Internship can be in Data Analytics or related disciplines.
- There should be minimum 60 hrs. of engagement from the student in the Internship.
- Summer vacations and other holidays can be used for completing the Internship.
- In B.Sc. Data Analytics Honours program, institute/ industry visit or study tour can be part of Internship. Visit to national research institute, research laboratory and place of scientific importance should be part of the study tour. A brief report of the study tour has to be submitted with photos.
- The students should make regular and detailed entries in to a personal log book through the period of Internship. The log book will be a record of the progress of the Internship and the time spent on the work, and it will be useful in writing the final report. It may contain experimental conditions and results, ideas, mathematical expressions, rough work and calculation, computer file names etc. All entries should be dated. The Internship supervisor should periodically examine and countersign the log book.
- The log book and the report must be submitted at the end of the Internship.
- The institution at which the Internship will be carried out should be prior-approved by the Department Council of the College where the student has enrolled for the UG Honours program.

## Evaluation of Internship

- The evaluation of Internship shall be done internally through continuous assessment mode by a committee internally constituted by the Department Council of the college where the student has enrolled for the UG Honours program.
- The credits and marks for the Internship will be awarded only at the end of semester 6.

### The scheme of CCA and ESE is given below:

| Components of Evaluation of Internship | Weightage | Marks for Internship 2 Credit/50 Marks |
|---|---|---|
| Continuous Comprehensive Assessment (CCA) | 30% | 15 |
| End Semester Evaluation | 70% | 35 |

### The detailed distribution table with the components

| EVALUATION TYPE | | MARKS |
|---|---|---|
| **ESE** | | **35** |
| a) | Acquisitions of skill | 20 |
| b) | Report | 15 |
| **CCA** | | 15 |
| a) | Punctuality | 5 |
| b) | Logbook | 10 |
| **TOTAL** | | **75** |

# PROJECT IN HONOURS PROGRAMME

- In Honours programme, the student has the option to do a Project of 12-credits in Major instead of three major Courses or Project of 8-credits in Major and one major course in semester 8.
- The Project can be done in the same institution/ any other higher educational institution (HEI) / research centre/ training centre.
- The Project in Honours programme can be a short research work or an extended internship or a skill-based training programme.

- A faculty member of the respective institution, where the student does the Project, should be the supervisor of the Project.

## PROJECT IN HONOURS WITH RESEARCH PROGRAMME

- Students who secure 75% marks and above (equivalently, CGPA 7.5 and above) cumulatively in the first six semesters are eligible to get selected to Honours with Research stream in the fourth year.
- In Honours with Research programme, the student has to do a mandatory Research Project of 12-credits instead of three Core Courses in Major in semester 8.
- The number of seats for the Honours with research shall be determined as per the availability of eligible faculty.
- The selection criteria for Honours with research stream shall be in accordance with the guidelines of UGC or as approved by Kannur University.
- Students who have chosen the honours with research stream shall be mentored by a faculty with a PhD.
- The mentor shall prescribe suitable advanced-level courses for a minimum of 20 credits to be taken within the institutions along with the papers on research methodology, research ethics, and research topic-specific courses for a minimum of 12 credits which may be obtained either within the institution or from other recognized institutions, including online and blended modes.
- These students who have opted for the honours with research should complete a research project under the guidance of the mentor and should submit a research report for evaluation. They need to successfully defend the research project to obtain 12 credits under a faculty member of the University/College within the University.
- The research outcomes of their project work may be published in peer-reviewed journals or presented at conferences or seminars or patented.

## GUIDELINES FOR THE PROJECT IN HONOURS PROGRAMME AND HONOURS WITH RESEARCH PROGRAMME

- Project can be in Data Analytics or allied disciplines.
- Project should be done individually.
- Project work can be of experimental/ theoretical/ computational in nature.

- There should be minimum 360 hrs. of engagement from the student in the Project work in Honours programme as well as in Honours with Research programme.
- There should be minimum 13 hrs./week of engagement (the hours corresponding to the three core courses in Major in semester 8) from the teacher in the guidance of the Project(s) in Honours programme and Honours with Research programme.
- The various steps in project works are the following:
    - Review
    - Investigation on a problem in systematic way.
    - Systematic recording.
    - Reporting the results with interpretation in a standard documented form.
    - Presentation of the results before the examiners.
- The report must be submitted at the end of the Project. A copy of the report should be kept for reference at the department. A soft copy of the report too should be submitted, to be sent to the external examiner in advance.
- The project report shall have an undertaking from the student and a certificate from the research supervisor for originality of the work, stating that there is no plagiarism, and that the work has not been submitted for the award of any other degree/ diploma in the same institution or any other institution.

## Evaluation of Project

- The evaluation of Project will be conducted at the end of the eighth semester by both internal and external modes.
- The internal evaluation of the Project work shall be done through continuous assessment mode by a committee internally constituted by the Department Council of the college where the student has enrolled for the UG Honours programme. 30% of the weightage shall be given through this mode.
- The remaining 70% shall be awarded by the external examiner appointed by the University.

**The scheme of evaluation of the Project is given below:**

| **Project type** | **Maximum Marks** | **CCA (30%)** | **ESE (70%)** |
|---|---|---|---|
| Research Project of 12 Credits (UG Honours with research, mandatory | 300 | 90 | 210 |
| Research Project of 12 Credits (UG Honours, optional) | 300 | 90 | 210 |

| | | | |
|---|---|---|---|
| Research Project of 8 Credits (UG Honours, optional) | 200 | 60 | 140 |

**The detailed distribution table with the components**

| CCA | | | |
|---|---|---|---|
| **Sl. No** | **Components of Evaluation of Project** | **Marks for the Project (Honours/Honours with Research) 12 credits** | **Marks for the Project (Honours/Honours with Research) 8 credits** |
| 1 | Skill in doing project work | 30 | 20 |
| 2 | Internal Presentation and Viva-Voce | 20 | 15 |
| 3 | Punctuality and Attendance* | 20 | 15 |
| 4 | Organization of Project Report | 20 | 10 |
| | **Total Marks** | **90** | **60** |

*Attendance certificate should be produced by the students who have done their projects in any higher educational institution (HEI)/ research centre/ training centre.

| ESE | | | |
|---|---|---|---|
| **Sl. No.** | **Components of Evaluation of Project** | **Marks for the Project (Honours/Honours with Research) 12 credits** | **Marks for the Project (Honours/Honours with Research) 8 credits** |
| 1 | Content and relevance of the Project, Methodology, Quality of analysis, and Innovations of Research | 50 | 40 |
| 2 | Presentation of the Project | 50 | 30 |
| 3 | Project Report | 40 | 20 |
| 4 | Viva-Voce | 70 | 50 |
| | **Total Marks** | **210** | **140** |

## EXTERNAL EVALUATION

- Examinations will be conducted at the end of each semester. The students can write the external examinations in Data Analytics in both English and Malayalam languages.
- Individual questions are evaluated in marks and the total marks are converted into grades by the University based on 10-point grading system.

| Letter Grade | Grade Point(P) |
|---|---|
| O (Outstanding | 10 |
| A+ (Excellent) | 9 |
| A (Very Good) | 8 |
| B+ (Good) | 7 |
| B (Above Average) | 6 |
| C (Average) | 5 |
| P (Pass) | 4 |
| F (Fail) | 0 |
| Ab (Absent) | 0 |

- A minimum of grade point 4 (Grade P) is needed for the successful completion of a Course.
- A student who has failed in a Course can reappear for the End Semester Examination of the same Course along with the next batch without taking re-admission or choose another Course in the subsequent Semesters of the same programme to acquire the minimum credits needed for the completion of the Programme.
- There shall not be provision for improvement of CE and ESE.
- A student who has successfully completed the CE requirements in a subsequent semester can also appear for the ESE subject to the maximum duration permitted.

### Computation of SGPA and CGPA

The following method is recommended to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA):

- The SGPA is the ratio of the sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e. **SGPA** (Si) = Σ(Ci x Gi) / ΣCi, where Ci is the number of credits of the course and Gi is the grade point scored by the student in the course.

**Example:**

| Semester | Course | Credit | Letter Grade | Grade Point | Credit Point (Credit x Grade) |
|---|---|---|---|---|---|
| I | Course 1 | 3 | A | 8 | 3 x 8= 24 |
| I | Course 2 | 4 | B+ | 7 | 4 x 7= 28 |
| I | Course 3 | 3 | B | 6 | 3 x 6= 18 |
| I | Course 4 | 3 | O | 10 | 3 x 10= 30 |
| I | Course 5 | 3 | C | 5 | 3 x 5= 15 |
| I | Course 6 | 4 | B | 6 | 4 x 6= 24 |
| | | 20 | | | 139 |
| **SGPA** | | | | | **139/20=6.95** |

- The Cumulative Grade Point Average (CGPA) is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme, i.e. CGPA = Σ (Ci x Si) / Σ Ci Where Si is the SGPA of the semester and Ci is the total number of credits in that semester.
- The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts. Transcript (Format): Based on the above recommendations on Letter grades, grade points and SGPA and CCPA, the HEIs may issue the transcript for each semester and a consolidated transcript indicating the performance in all semesters

**Example:**

| Semester I | Semester II | Semester III | Semester IV | Semester V | Semester VI |
|---|---|---|---|---|---|
| Credit: 21<br>SGPA: 6.9 | Credit: 21<br>SGPA: 7.8 | Credit: 22<br>SGPA: 5.6 | Credit: 24<br>SGPA: 6.0 | Credit: 23<br>SGPA: 6.3 | Credit: 22<br>SGPA: 8.0 |
| CGPA=(21 x 6.9 + 21 x 7.8 + 22 x 5.6 + 24 x 6.0 + 23 x 6.3 + 22 x 8.0) / 133 = 6.74 | | | | | |

- The SGPA is the ratio of the sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e. **SGPA** (Si) = Σ (Ci x Gi) / ΣCi. Where Ci is the number of credits of the course and Gi is the grade point scored by the student in the course.

| CGPA | Overall letter Grade |
|---|---|
| 9.5 and above O | O |
| 8.5 and above but less than 9.5 | A+ |
| 7.5 and above but less than 8.5 | A |
| 6.5 and above but less than 7.5 | B+ |
| 5.5 and above but less than 6.5 | B |
| 4.5 and above but less than 5.5 | C |
| 4.0 and above but less than 4.5 | D |
| Less than 4.0 | F |

Appearance for Continuous Evaluation (CE) and End Semester Examination (ESE) are compulsory, and no Grade shall be awarded to a candidate if the candidate is absent for CE or ESE or both.

# SYLLABUS

## SEMESTER: I

## DISCIPLINE SPECIFIC COURSES

### KU1DSCDAS101: FUNDAMENTALS OF IT AND COMPUTERS

| Semester | Course Type | Course Level | Course Code | Credits | Total Hours |
|---|---|---|---|---|---|
| 1 | DSC | 100-199 | KU1DSCDAS101 | 4 | 60 |

| Learning Approach (Hours/ Week) | | | Marks Distribution | | | Duration of ESE (Hours) |
|---|---|---|---|---|---|---|
| Lecture | Practical/ Internship | Tutorial | CE | ESE | Total | |
| 4 | - | - | 30 | 70 | 100 | 2 Hrs. |

**Course Description:**

This course covers the fundamentals of computers, data representation, software, and networks, along with an introduction to emerging technologies like AI, ML, Cloud Computing, Quantum Computing, and IoT.

**Course Prerequisite: NIL**

**Course Outcomes:**

| CO No. | Expected Outcome | Learning Domains |
|---|---|---|
| CO1 | Understand the basic components of computers and data representation techniques. | R, U |
| CO2 | Identify different types of software, programming languages, and language processors. | U, A |
| CO3 | Explain computer networks, topologies, and common internet services. | R, U |
| CO4 | Gain awareness of emerging IT trends such as AI, Cloud Computing, Quantum Computing, and IoT. | U |

***Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)***

## Mapping of Course Outcomes to PSOs

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| CO1 | 3 | | | | 2 |
| CO2 | 3 | | | | 2 |
| CO3 | 2 | | | | 2 |
| CO4 | 3 | | | | 2 |

## COURSE CONTENTS

**Contents for Classroom Transaction:**

| MODULE | UNIT | DESCRIPTION | HOURS |
|---|---|---|---|
| 1 | **MODULE TITLE: Basic Components of Computer and Data Representation** | | |
| | 1 | **Introduction to Computers**: Definition and Characteristics of Computers, Brief History and Evolution of Computers. | 12 |
| | 2 | **Basic Components of a Computer System** - Input, Output, Memory and CPU. | |
| | 3 | **Memory Classification:** Cache memory, Primary Memory - RAM (Random Access Memory) and ROM (Read Only Memory), Secondary Memory - Hard Drives, SSDs, USB Drives, Memory hierarchy. | |
| 2 | **MODULE TITLE: Introduction to Data Representation and Softwares** | | |
| | 1 | **Data Representation:** Decimal, Binary, Hexadecimal and Octal Number Systems, Conversion Between Number Systems. | 12 |
| | 2 | **Binary Arithmetic and Complements:** Binary addition, subtraction, 2 Complements of Binary Numbers (1's Complement and 2's Complement). | |
| | 3 | **Introduction to Software:** Types of Software - Application software, System Software. | |
| | 4 | **Programming Languages:** Machine, Assembly, High-Level and 4GL. Source code and Object code. | |
| | 5 | **Language Processors:** Assembler, Compiler, Interpreter, Linker and Loader (Concepts Only). | |

| | | | |
|---|---|---|---|
| **3** | **MODULE TITLE: Basics of Networks** | | |
| | **1** | **Classification of Networks:** LAN, WAN, MAN, Internet. Network devices. | **12** |
| | **2** | **Network Topologies-**Bus, Star, Ring and Mesh. | |
| | **3** | **Internet:** Definition, Features, Internet architecture, Internet Connections. | |
| | **4** | **Internet Services –** WWW, Email, File transfer, Chat, Video conferencing, Search engines, Web browsing and Web publishing. | |
| **4** | **MODULE TITLE: Emerging Trends in IT** | | |
| | **1** | **Artificial Intelligence:** Definition, Examples of AI, Importance of AI, Types of AI- Based on capabilities and Functionalities, Applications of AI. | **12** |
| | **2** | **Cloud Computing:** Introduction to cloud computing and architecture, Types of Cloud Services (IaaS, PaaS, SaaS- Concepts only), Deployment models (Public, Private, Hybrid and Community Cloud- Concepts only). | |
| | **3** | **Quantum Computing:** Definition, Core Principles, and Applications. | |
| | **4** | **Internet of Things (IoT):** Overview of IoT, Key features, Advantages, Disadvantages**,** Architecture of IoT. | |
| **5** | **Teacher Specific Module** | | **12** |
| | ***Directions*** | | |
| | ***Concerned teacher can adopt proper methodologies and evaluation metrics to understand the topics.*** | | |

**Essential Readings:**


1. Goel, Anita, Computer Fundamentals. Pearson Education India, 2010.
2. Floyd, Thomas L, "Digital fundamentals", 10th Edition. Pearson Education India, 2011.
3. ITL Education Solutions Ltd, "Introduction to Information Technology", Pearson Education India, 2005.
4. Pradeep. K. Sinha, Priti Sinha, Information Technology: Theory and Practice, Kindle Edition, 2016.


**Suggested Readings:**


**1.** Stuart Russell and Peter Norvig, "Artificial Intelligence: A Modern Approach", Third Edition.

2. V.K. Pachghare, "Cloud Computing" –PHI Delhi Learning Private Limited, 2016.

4. Ethem Alpaydin, "Introduction to Machine Learning", Third Edition, The MIT press, 2014.

5. Arshdeep Bahga and Vijay Madisetti, “Internet of Things – A Hands-On Approach”, Universities Press, 2015.

6. Seema Acharya, Subhasini Chellappan, "Big Data Analytics" Wiley, 2015.

## ASSESSMENT RUBRICS

| **Evaluation Type** | | **Marks** |
|---|---|---|
| End Semester Evaluation | | 70 |
| Continuous Evaluation | | 30 |
| **a)** | Test Paper- 1 | 5 |
| **b)** | Model Examination | 10 |
| **c)** | Assignment (2 numbers) | 10 |
| **d)** | Seminar | 5 |
| **e)** | Book/ Article Review | |
| **f)** | Viva-Voce | |
| **g)** | Field Report | |
| **Total** | | **100** |

# KU1DSCDAS102 EMERGING TECHNOLOGIES IN INFORMATION TECHNOLOGY

| Semester | Course Type | Course Level | Course Code | Credits | Total Hours |
|---|---|---|---|---|---|
| 1 | DSC | 100-199 | KU1DSCDAS102 | 4 | 60 |

| Learning Approach (Hours/ Week) | | | Marks Distribution | | | Duration of ESE (Hours) |
|---|---|---|---|---|---|---|
| Lecture | Practical/ Internship | Tutorial | CE | ESE | Total | |
| 4 | - | - | 30 | 70 | 100 | 2 Hrs |

**Course Description:**

This course introduces key emerging technologies in IT, including Edge Computing, 5G, AI, ML, IoT, Blockchain, Cloud Computing, and Big Data Analytics. It focuses on core concepts, applications, benefits, and challenges, highlighting their real-world impact on IT infrastructure, industries, and society.

**Course Prerequisite: NIL**

**Course Outcomes:**

| CO No. | Expected Outcome | Learning Domains |
|---|---|---|
| CO1 | Identify the impact of emerging technologies in the field of IT and real life. | U |
| CO2 | Analyze the applications and impact of these technologies on IT infrastructure, industries, and society. | U, An |
| CO3 | Differentiate between various models, types, and architectures related to AI, ML, IoT, Blockchain, Cloud, and Big Data. | E |
| CO4 | Apply conceptual knowledge to identify opportunities and challenges of adopting emerging technologies in real-world scenarios. | U, A |

***Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)***

## Mapping of Course Outcomes to PSOs

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| **CO1** | **3** | | | **2** | **2** |
| **CO2** | **3** | | | **2** | **2** |

| | | | | | |
|---|---|---|---|---|---|
| **CO3** | **3** | | | **2** | **2** |
| **CO4** | **3** | | | **2** | **2** |

## COURSE CONTENTS

**Contents for Classroom Transaction:**

| M O D U LE | U N I T | DESCRIPTION | HOURS |
|---|---|---|---|
| **1** | **MODULE TITLE: Introduction to Emerging Technologies** | | |
| | 1 | Overview of current trends in IT, the importance of staying updated with technology. | **12** |
| | 2 | Edge computing: Definition, advantages, Examples of edge computing applications. | |
| | 3 | 5G Technology: The impact of 5G technology on IT infrastructure, Key features, advantages, Applications. | |
| **2** | **MODULE TITLE: Artificial Intelligence and Machine Learning** | | |
| | 1 | Artificial Intelligence: Basic concept of AI, Scope of AI, Components of AI, Types of AI, Applications in various industries, Advantages and disadvantages. | **12** |
| | 2 | Introduction to machine learning, Types of machine learning (Supervised, Unsupervised, Reinforcement-concepts only), Applications of machine learning. | |
| **3** | **MODULE TITLE: Internet of Things and Blockchain Technology** | | |
| | 1 | Introduction to IoT: Definition, Characteristics, Feature and Applications of IoT, Advantages and Disadvantages. | **12** |
| | 2 | Physical design of IoT: Things in IoT, IoT protocols. | |
| | 3 | Introduction to Blockchain, Centralized versus Decentralized System, Types of blockchains: Public, Private, Consortium. | |
| | 4 | Layers of Blockchain, Importance of Blockchain. | |
| **4** | **MODULE TITLE: Cloud Computing and Big Data Analytics** | | |
| | 1 | Cloud Computing: Introduction, characteristics, advantages, disadvantages, Cloud computing architecture Types of cloud services (IaaS, PaaS, Saas). | **12** |
| | 2 | Deployment models: Public, Private, Hybrid, Community. | |
| | 3 | Big Data Analytics: Classification of Digital data-Structured, Semi-structured and Unstructured. | |

| | | | |
|---|---|---|---|
| | | Introduction to Big Data: Characteristics of data, Evolution of big data. Definition of big data and big data analytics. | |
| **5** | **Teacher Specific Module** | | **12** |
| | ***Directions*** | | |
| | ***Concerned teacher can adopt proper methodologies and evaluation metrics to understand the topics.*** | | |

**Essential Readings:**


1. Stuart Russell and Peter Norvig, "Artificial Intelligence: A Modern Approach", Third Edition.
2. Saikat Dutt, Subramanian Chandramouli, Amit Kumar Das, ―Machine Learning, Pearson Education.
3. V.K. Pachghare, "Cloud Computing" –PHI Delhi Learning Private Limited, 2016.
4. Ethem Alpaydin, "Introduction to Machine Learning", Third Edition, The MIT press, 2014.
5. Arshdeep Bahga and Vijay Madisetti, "Internet of Things – A Hands-On Approach", Universities Press, 2015.
6. Seema Acharya, Subhasini Chellappan, "Big Data Analytics", Wiley, 2015.


## ASSESSMENT RUBRICS

| **Evaluation Type** | | **Marks** |
|---|---|---|
| End Semester Evaluation | | 70 |
| Continuous Evaluation | | 30 |
| **a)** | Test Paper- 1 | 5 |
| **b)** | Model Examination | 10 |
| **c)** | Assignment (2 numbers) | 10 |
| **d)** | Seminar | 5 |
| **e)** | Book/ Article Review | |
| **f)** | Viva-Voce | |
| **g)** | Field Report | |
| **Total** | | **100** |

# KU1DSCDAS103 MULTIMEDIA AND SOFTWARE APPLICATIONS

| Semester | Course Type | Course Level | Course Code | Credits | Total Hours |
|---|---|---|---|---|---|
| 1 | DSC | 100-199 | KU1DSCDAS103 | 4 | 75 |

| Learning Approach (Hours/ Week) | | | Marks Distribution | | | Duration of ESE (Hours) |
|---|---|---|---|---|---|---|
| Lecture | Practical/ Internship | Tutorial | CE | ESE | Total | |
| 3 | 2 | - | 35 | 65 | 100 | 1.5 Hrs |

**Course Description:** This course covers the basics of multimedia, including text, audio, video, graphics, and animation, with hands-on training in open-source tools for photo, video, audio editing, and simple animation creation.

**Course Prerequisite: NIL**

**Course Outcomes:**

| CO No. | Expected Outcome | Learning Domains |
|---|---|---|
| CO1 | Understand the fundamentals of multimedia, its components, and applications including virtual reality. | U |
| CO2 | Apply basic image editing techniques using photo editing software to manipulate layers, text, and color formats. | U, A |
| CO3 | Develop simple video projects using video editing software by adding clips, transitions, effects, and exporting final output. | A, C |
| CO4 | Edit audio tracks and create basic animations using audio and animation software tools. | A, C |

***Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)***

## Mapping of Course Outcomes to PSOs

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| **CO1** | **2** | **2** | | | |
| **CO2** | **2** | **2** | | | |
| **CO3** | **2** | **2** | | | |
| **CO4** | **2** | **2** | | | |

# COURSE CONTENTS

**Contents for Classroom Transaction:**

| M O D U LE | U N I T | DESCRIPTION | HOURS |
|---|---|---|---|
| **1** | **MODULE TITLE: Basics of Multimedia** | | |
| | **1** | Definition of Multimedia, Multimedia system characteristics, Desirable features of a multimedia system. | **15** |
| | **2** | Building blocks of multimedia (Text, Graphics, Audio, Video, Animation). | |
| | **3** | Multimedia System, Desirable Features of Multimedia System. | |
| | **4** | Multimedia Applications, Virtual reality. | |
| | **5** | Definitions of System Software and Application Software Introduction to Media Software Application. | |
| **2** | **MODULE TITLE: Photo Editing Software Applications** | | |
| | **1** | Installation and interface overview of any open-source tool (e.g., GIMP), Basic image and layer manipulation. | **15** |
| | **2** | Adding Text to image, layers-masking technique. | |
| | **3** | Overview of image formats (JPEG, PNG, TIFF, etc.), Basic colour correction using curves. | |
| | **4** | Advanced Photo Editing -Black & White (B&W) conversion, Luminosity masks, Tone mapping techniques. | |
| **3** | **MODULE TITLE: Video Editing Software Applications** | | |
| | 1 | Introduction to video editing software (e.g., OpenShot), Features, System requirements, and Installation. | **15** |
| | 2 | Basic terms - Project, Timeline, Track, Clip and Transition. | |
| | 3 | Introduction to software interface overview, creating first simple project - add photo, music, timeline, preview and export the video. | |
| | 4 | Clips, transition, Effects and animation. | |
| **4** | **MODULE TITLE: Audio and Animation** | | |
| | 1 | Software for Audio: Audacity, software interface, Stereo Audio Track control panel, Splitting and Joining Tracks, Changing the track display. | **15** |
| | 2 | Applying audio effects, effect adjustments-Volume, fading, pitch, noise removal, delay, distortion. | |

| | | | |
|---|---|---|---|
| | 3 | Software for Basic Animation: An Introduction to Synfig - Importing your artwork, Tools, Layers. | |
| | 4 | Parameters, Converters, Configuration, Canvas, Interface, Export. | |
| **5** | **Teacher Specific Module** | | **15** |
| | ***Directions: The following exercises may be used as references for conducting lab experiments. This is not the final list of experiments for the practical examination. Additional experiments may be added to further enhance the practical skills of students*** | | |
| | 1. Create/Import an image and apply various effects on it.<br>2. Mixing Audio by importing music files.<br>3. A simple project - add photo, music, timeline, preview and export the video.<br>4. Create a 30 secs animation video. | | |

NB: In case the tools mentioned here are unavailable you may use relevant tools (preferably open source.)

**Essential Readings:**


1. ITL Education Solutions Limited, "Introduction to Information Technology" Second Edition, Pearson Education.
2. Oilver Lecarme & Karine Delvare, "The Book of GIMP – A Complete Guide to Nearly Everything", Kindle Edition, 2013.


**Suggested Readings:**


1. https://librearts.org/2022/08/audio-editors-for-linux-that-are-not-audacity/
2. https://www.gimp.org/tutorials/
3. https://www.gimp.org/tutorials/The_Basics/
4. https://synfig.readthedocs.io/en/latest/quick_start.html
3. https://www.openshot.org/user-guide/
4. https://support.audacityteam.org/
5. https://synfig.readthedocs.io/en/latest/index.html


## ASSESSMENT RUBRICS

| **Evaluation Type** | | **Marks** | **Evaluation Type** | | **Marks** | **Total** |
|---|---|---|---|---|---|---|
| **Lecture** | | **75** | **Practical** | | **25** | **100** |
| a) | ESE | 50 | a) | ESE | 15 | |
| | | | | Program code and execution | 8 | |
| | | | | Output | 3 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Viva | | 2 | |
| | | | | | Modification | | 2 | |
| b) | CCA | | 25 | b) | CCA | | 10 | |
| | i | Test Paper | 5 | | i | Punctuality | 3 | |
| | | Model exam | 10 | | | | | |
| | ii | Assignment/ Book-<br>Article review /field report | 5 | | ii | Model Exam | 4 | |
| | iii | Seminar/ Viva-Voce | 5 | | iii | Record | 3 | |

## MULTI DISCIPLINARY COURSE(MDC)

### KU1MDCDAS101 COMPUTER FUNDAMENTALS

| Semester | Course Type | Course Level | Course Code | Credits | Total Hours |
|---|---|---|---|---|---|
| 1 | MDC | 100-199 | KU1MDCDAS101 | 3 | 45 |

| Learning Approach (Hours/ Week) | | | Marks Distribution | | | Duration of ESE (Hours) |
|---|---|---|---|---|---|---|
| Lecture | Practical/ Internship | Tutorial | CE | ESE | Total | |
| 3 | - | - | 25 | 50 | 75 | 1.5 Hrs |

**Course Description:**

This course provides an introduction to computers, covering their basics, hardware, software, networks, and internet fundamentals, along with essential concepts of computer security.

**Course Prerequisite: NIL**

**Course Outcomes:**

| CO No. | Expected Outcome | Learning Domains |
|---|---|---|
| CO1 | Understand the basic concepts and history of computers. | U |
| CO2 | Identify hardware components and their functions. | U |
| CO3 | Differentiate between types of software and operating systems. | An |
| CO4 | Understand basics of networking, internet, and computer security. | U |

***Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)***

## Mapping of Course Outcomes to PSOs

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| **CO1** | **2** | | | | **2** |
| **CO2** | **2** | | | | **2** |
| **CO3** | **2** | | | | **2** |
| **CO4** | **2** | | | | **2** |

# COURSE CONTENTS

**Contents for Classroom Transaction:**

| M O D U LE | U N I T | DESCRIPTION | HOURS |
|---|---|---|---|
| **1** | **MODULE TITLE: Basics of Computers** | | |
| | 1 | Definition, Characteristics of computers, History of computer. | **9** |
| | 2 | Functions of computer system, Classification of computers, Block diagram of a computer. | |
| | 3 | Problem solving using computers- Steps to solve a problem. | |
| **2** | **MODULE TITLE: Computer Hardware** | | |
| | 1 | Basic Components: Input, Output, Storage, and Processing devices. | **9** |
| | 2 | Central Processing Unit (CPU): Control Unit, ALU, Registers. | |
| | 3 | Memory types: Primary (RAM, ROM, Cache), Secondary (Hard Disk, SSD), Portable storage (USB, CD/DVD). | |
| **3** | **MODULE TITLE: Computer Software** | | |
| | 1 | Definition of Software. | **9** |
| | 2 | Types of Software: System Software, Application Software, Utility Software. | |
| | 3 | Operating System: Functions and Examples (Windows, Linux, macOS). | |
| | 4 | Programming Languages: Machine language, Assembly, High-level languages (basic idea). | |
| **4** | **MODULE TITLE: Computer Networks and Internet** | | |
| | 1 | Basics of Data Communication. | **9** |
| | 2 | Types of Networks: LAN, MAN, WAN. | |
| | 3 | Internet basics: Web browsers, Search engines, Email. | |
| | 4 | Computer Security basics: Viruses, Firewalls, Antivirus software, Safe practices. | |
| **5** | **Teacher Specific Module** | | **9** |
| | ***Directions*** | | |

| | | |
|---|---|---|
| | *Concerned teacher can adopt proper methodologies and evaluation metrics to understand the topics.* | |

**Essential Readings:**


1. P.K. Sinha & P. Sinha, "Computer Fundamentals", Eight Edition, BPB Publications, 2020.
2. Rajaraman V. & Adabala N, "Fundamentals of Computers", Sixth Edition, PHI Learning, 2015.
3. Alexis Leon & Mathews Leon, "Fundamentals of Information Technology", Second Edition, Vikas Publishing House, 2009.


**Suggested Readings:**


1. Peter Norton, "Introduction to Computers", 6th Edition, McGraw Hill.


## ASSESSMENT RUBRICS

| **Evaluation Type** | | **Marks** |
|---|---|---|
| End Semester Evaluation | | 50 |
| Continuous Evaluation | | 25 |
| **a)** | Test Paper- 1 | 5 |
| **b)** | Model Examination | 10 |
| **c)** | Assignment | 5 |
| **d)** | Seminar | 5 |
| **e)** | Book/ Article Review | |
| **f)** | Viva-Voce | |
| **g)** | Field Report | |
| **Total** | | **75** |

# SEMESTER II

## DISCIPLINE SPECIFIC COURSES(DSC)

## KU2DSCDAS104 PYTHON PROGRAMMING

| Semester | Course Type | Course Level | Course Code | Credits | Total Hours |
|---|---|---|---|---|---|
| 2 | DSC | 100-199 | KU2DSCDAS104 | 4 | 75 |

| Learning Approach (Hours/ Week) | | | Marks Distribution | | | Duration of ESE (Hours) |
|---|---|---|---|---|---|---|
| Lecture | Practical/ Internship | Tutorial | CE | ESE | Total | |
| 3 | 2 | - | 35 | 65 | 100 | 2 Hrs |

**Course Description:** This course provides an introduction to Python programming, covering basic syntax, control flow, functions, and exception handling. It emphasizes the use of data structures, string manipulation, and file handling, along with libraries such as NumPy and Pandas. Students will also learn to design simple GUI applications using Tkinter.

**Course Prerequisite: NIL**

**Course Outcomes:**

| CO No. | Expected Outcome | Learning Domains |
|---|---|---|
| CO1 | Understand Python basics, syntax, and control flow. | U |
| CO2 | Apply data structures, string handling, and exception handling for problem-solving. | A |
| CO3 | Work with files, CSV data, and Python libraries like NumPy and Pandas for data management. | A |
| CO4 | Create an application with the support of graphics in Python. | C |

***Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)***

## Mapping of Course Outcomes to PSOs

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| **CO1** | **3** | **3** | | **3** | |
| **CO2** | **3** | **2** | | **2** | |

| | | | | | |
|---|---|---|---|---|---|
| **CO3** | **3** | **2** | | **2** | |
| **CO4** | **3** | **2** | | **2** | |

# COURSE CONTENTS

**Contents for Classroom Transaction:**

| M O D U LE | U N I T | DESCRIPTION | HOURS |
|---|---|---|---|
| **1** | **MODULE TITLE: Introduction to Python** | | |
| | 1 | History of Python Programming, Thrust Areas of Python, Installing Anaconda Python Distribution, PyCharm IDE and Jupyter Notebook, Creating and Running First Python. | 15 |
| | 2 | Identifiers, Keywords, Statements and expressions, Variables, Operators, Precedence and Associativity, Data Types, Indentation, Comments. | |
| | 3 | Reading Input, Print Output, Type Conversions, the type () function and Is operator. | |
| **2** | **MODULE TITLE: Control Flow Statement and Functions** | | |
| | 1 | Decision control flow statement (if, if …else, if…elif…, nested if). | 15 |
| | 2 | Loops (while, for, range (), enumerate () function), Nested loops, Control statements (break, continue, pass statements). | |
| | 3 | Catching Exception Using try and except Statement. | |
| | 4 | Functions- Built-In Functions Commonly Used Modules, Function definition and calling the function, The return statement and void function, scope and life time of variables, Command line arguments. | |
| **3** | **MODULE TITLE: Lists, Dictionaries, Tuple, Set and String Handling** | | |
| | 1 | Lists- Creating List, Basic List Operations, Indexing and Slicing in Lists, Built-In Functions used on lists, List Methods. | **15** |
| | 2 | Dictionaries- Creating Dictionary, Accessing and Modifying key: value Pairs in Dictionaries, Built-In Functions used on Dictionaries, Dictionary Methods, The del statement. | |
| | 3 | Tuples: Creating Tuples, Basic Tuple Operations, Indexing and Slicing in Tuples, Built-In Functions used on Tuples, Relation between Tuples and Lists, Relation between Tuples and Dictionaries, Tuple Methods, Using zip () function. | |
| | 4 | Sets, Set methods, Frozenset. | |

| | | | |
|---|---|---|---|
| | 5 | Strings- Creating and Storing Strings, Basic String Operations, Accessing Characters in String by Index Number, String Slicing and Joining, String Methods, Formatting Strings. | |
| **4** | **MODULE TITLE: Files and GUI in Python** | | |
| | 1 | Files- Types of Files, Creating and Reading Text Data, File Methods to Read and Write Data, Reading and Writing Binary files, Reading and Writing CSV Files, Introduction to NumPy and Pandas. | **15** |
| | 2 | GUIs in Python: Root Window-Fonts and colors- Working with containers and canvas, Frames, Widgets, Button widgets, Arranging widgets in the Frame. | |
| | 3 | Label Widget, Message Widget, Text widget, Scrollbar widgets, Check button widget, Radio button widget, Entry Widget, Spin box Widget, List Box Widget, Menu Widget. | |
| **5** | **Teacher Specific Module** | | **15** |
| | ***Directions: The following exercises may be used as references for conducting lab experiments. This is not the final list of experiments for the practical examination. Additional experiments may be added to further enhance the practical skills of students.*** | | |
| | **1.** Write a program to perform basic arithmetic operations (addition, subtraction, multiplication, division) on two numbers.<br>**2.** Write a program that reverses a number and calculates the sum of its digits.<br>**3.** Write a Python program to get the largest number from a list.<br>**4.** Write a Python script to sort (ascending and descending) a dictionary by value.<br>**5.** Write a Python program to create a set.<br>**6.** Write a Python program to create a union of sets.<br>**7.** Write a Python program to read a given CSV file as a list.<br>**8.** Develop a function to check if a given string is a palindrome.<br>**9.** Perform operations like removing duplicates, finding the second largest element, and reversing a list without using the reverse () method.<br>**10.** Write programs to perform linear and binary search on a list of numbers.<br>**11.** Write a program to read from and write to text files.<br>**12.** Write a Python program to create a root window with a custom background color, set the window title, and display a label in a different font and color. | | |

**Essential Readings:**

1. Gowrishankar S, Veena A, ―Introduction to Python Programming, 1st Edition, CRC Press/Taylor & Francis, 2018. ISBN-13: 978-0815394372

2. Alberto Fernandez Villan, Mastering OpenCV 4 with Python, Packt Publishing Ltd, 2019, ISBN-13 978-1789344912.
3. Dr. R Nageswara Rao, Core Python Programming, 2nd edition, Dreamtech Publisher, 2019

**Suggested Readings:**

1. Wesley J. Chun, Core Python Programming, Second Edition, Publisher: Prentice Hall Pub, 2006.

## ASSESSMENT RUBRICS

<table>
<tr><th colspan="3">Evaluation Type</th><th>Marks</th><th colspan="3">Evaluation Type</th><th>Marks</th><th>Total</th></tr>
<tr><td colspan="3">Lecture</td><td>75</td><td colspan="3">Practical</td><td>25</td><td rowspan="11">100</td></tr>
<tr><td>a)</td><td colspan="2">ESE</td><td>50</td><td>a)</td><td colspan="2">ESE</td><td>15</td></tr>
<tr><td colspan="4" rowspan="4"></td><td></td><td colspan="2">Program code and execution</td><td>8</td></tr>
<tr><td></td><td colspan="2">Output</td><td>3</td></tr>
<tr><td></td><td colspan="2">Viva</td><td>2</td></tr>
<tr><td></td><td colspan="2">Modification</td><td>2</td></tr>
<tr><td>b)</td><td colspan="2">CCA</td><td>25</td><td>b)</td><td colspan="2">CCA</td><td>10</td></tr>
<tr><td></td><td>i</td><td>Test Paper</td><td>5</td><td></td><td>i</td><td>Punctuality</td><td>3</td></tr>
<tr><td></td><td></td><td>Model exam</td><td>10</td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>ii</td><td>Assignment/ Book-<br>Article review /field report</td><td>5</td><td></td><td>ii</td><td>Model Exam</td><td>4</td></tr>
<tr><td></td><td>iii</td><td>Seminar/ Viva-Voce</td><td>5</td><td></td><td>iii</td><td>Record</td><td>3</td></tr>
</table>

# KU2DSCDAS105 FUNDAMENTALS OF WEB PROGRAMMING

| Semester | Course Type | Course Level | Course Code | Credits | Total Hours |
|---|---|---|---|---|---|
| 2 | DSC | 100-199 | KU2DSCDAS105 | 4 | 75 |

| Learning Approach (Hours/ Week) | | | Marks Distribution | | | Duration of ESE (Hours) |
|---|---|---|---|---|---|---|
| Lecture | Practical/ Internship | Tutorial | CE | ESE | Total | |
| 3 | 2 | - | 30 | 70 | 100 | 1.5 Hrs |

**Course Description:** The course helps to design and practice real-world homepage programs and earn adequate experience with current web design techniques such as HTML5 and cascading style sheets

**Course Prerequisite: NIL**

**Course Outcomes:**

| CO No. | Expected Outcome | Learning Domains |
|---|---|---|
| CO1 | Identify different components in web technology and WWW | U, A |
| CO2 | Apply HTML Forms and CSS Styling to design web pages. U, A | U, A |
| CO3 | Design webpages using HTML Forms. | U, A |
| CO4 | Design interactive Web pages | U, A |

***Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)***

## Mapping of Course Outcomes to PSOs

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| **CO1** | **3** | **2** | | **2** | |
| **CO2** | **3** | **2** | | | |
| **CO3** | **3** | **2** | **2** | | |
| **CO4** | **3** | **2** | **2** | **2** | |

# COURSE CONTENTS

**Contents for Classroom Transaction:**

| M O D U LE | U N I T | DESCRIPTION | HOURS |
|---|---|---|---|
| **1** | **MODULE TITLE: Introduction to Internet and WWW** | | |
| | 1 | Introduction to Internet: Evolution of the Internet, World Wide Web, Web Browsers, URL, http. | **15** |
| | 2 | Web Basics: Static Vs Dynamic web pages, Client-Side Scripting versus Server-Side Scripting. | |
| | 3 | W3C & Web Hosting: World Wide Web Consortium (W3C), Web hosting, Types of web hosting, Free hosting. | |
| | 4 | Domain Name Registration: Concept, Importance, and Steps for Registering a Domain Name. | |
| **2** | **MODULE TITLE: HTML** | | |
| | 1 | Introduction to HTML: Creating HTML document, Tags & attributes, syntax of tag, Starting and ending tag, tag without end, building a webpage. | **15** |
| | 2 | Text formatting: Division, Paragraphs, Heading, Physical style tags, Text alignment, Fonts. | |
| | 3 | Hyperlink and loading images: Linking to other web pages, Images and <img> tag, Line breaks, comments. | |
| | 4 | List: Types of lists (Ordered, Unordered, Definition), Nested lists. | |
| **3** | **MODULE TITLE: HTML Tables and Forms** | | |
| | 1 | HTML Tables: Creating a table, Table tags and attributes, Formatting the table: width, height, alignment, border, padding & spacing, colspan & rowspan. | **15** |
| | 2 | HTML Forms: Form elements (input, select, textarea, button, datalist), Input types (text, password, submit, radio, checkbox, date, email, number). | |
| | 3 | Input type attributes (value, readonly, disabled, maxlength, autocomplete, list, min, max, placeholder). | |
| | 4 | HTML5 form validation (required and pattern attribute of input type). | |
| **4** | **MODULE TITLE: CSS (Cascading Style Sheets)** | | |
| | 1 | CSS -Advantages, types of CSS- Inline, internal and external CSS. | **15** |
| | 2 | Applying style to HTML using CSS. | |

| | | | |
|---|---|---|---|
| | 3 | CSS Properties: CSS Colours, Fonts, Borders, Padding. | |
| | 4 | Applying style using class and ID attribute. | |
| **5** | **Teacher Specific Module** | | **15** |
| | ***Directions: The following exercises may be used as references for conducting lab experiments. This is not the final list of experiments for the practical examination. Additional experiments may be added to further enhance the practical skills of students.*** | | |
| | 1. HTML program to implement basic HTML tags.<br>2. HTML program to implement various heading formatting Tags.<br>3. HTML program to implement IMG tag.<br>4. HTML program to implement various types of listing tax.<br>5. HTML program to design a table to represent the mark list<br>6. HTML program to implement various form elements and. attributes. | | |

**Essential Readings:**


1. Laura Lemay, Rafe Colburn & Jennifer Kyrnin, "Mastering HTML, CSS & JavaScript Web Publishing", Paperback, BPB Publications, 2016.
2. Thomas a Powell, "HTML & CSS: The Complete Reference", Fifth Edition, Tata McGraw Hill.
3. P.J. Deitel & H.M. Deitel Pearson, "Internet and World Wide Web How to program", 2nd Edition, 2001.
4. Paul Wang & Sanda Katila, "An Introduction to WEB Design and Programming", Course Technology Inc, 2003.
5. Julie C. Meloni, "HTML and CSS in 24 Hours, Sams Teach Yourself (Updated for HTML5 and CSS3)", Ninth Edition, 2013.


## ASSESSMENT RUBRICS

| **Evaluation Type** | | | **Marks** | **Evaluation Type** | | | **Marks** | **Total** |
|---|---|---|---|---|---|---|---|---|
| Lecture | | | 75 | Practical | | | 25 | **100** |
| a) | ESE | | 50 | a) | ESE | | 15 | |
| | | | | | Program code and execution | | 8 | |
| | | | | | Output | | 3 | |
| | | | | | Viva | | 2 | |
| | | | | | Modification | | 2 | |
| b) | CCA | | 25 | b) | CCA | | 10 | |
| | i | Test Paper | 5 | | i | Punctuality | 3 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Model exam | 10 | | | | | |
| | ii | Assignment/ Book-<br>Article review /field report | 5 | | ii | Model Exam | 4 | |
| | iii | Seminar/ Viva-Voce | 5 | | iii | Record | 3 | |

# KU2DSCDAS106 CONTENT MANAGEMENT SYSTEM AND WORDPRESS

| Semester | Course Type | Course Level | Course Code | Credits | Total Hours |
|---|---|---|---|---|---|
| 2 | DSC | 100-199 | KU2DSCDAS106 | 4 | 75 |

| Learning Approach (Hours/ Week) | | | Marks Distribution | | | Duration of ESE (Hours) |
|---|---|---|---|---|---|---|
| Lecture | Practical/ Internship | Tutorial | CE | ESE | Total | |
| 3 | 2 | - | 35 | 65 | 100 | 1.5 Hrs |

**Course Description:**

This course introduces the fundamentals of Content Management Systems (CMS) and their applications, with hands-on practice in WordPress. Students will learn CMS concepts, architecture, and features, and gain practical skills in installing WordPress, creating and managing content, customizing themes, and designing simple websites.

**Course Prerequisite:**

Basic knowledge of computers, internet usage, and web concepts.

Familiarity with HTML and CSS is desirable but not mandatory.

**Course Outcomes:**

| CO No. | Expected Outcome | Learning Domains |
|---|---|---|
| CO1 | Understand the fundamentals, types, features, and applications of Content Management Systems. | U |
| CO2 | Explain the architecture, components, and functioning of CMS with emphasis on security and performance. | U, A |
| CO3 | Analyze the use of CMS across domains and explore modern trends such as cloud, mobile, and headless CMS. | U |
| CO4 | Develop, customize, and manage content using WordPress for practical web applications. | A |

***Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)***

## Mapping of Course Outcomes to PSOs

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| **CO1** | **3** | | **2** | | **2** |
| **CO2** | **3** | | **2** | | **2** |
| **CO3** | **3** | | **2** | | **2** |
| **CO4** | **3** | | **2** | | **2** |

## COURSE CONTENTS

**Contents for Classroom Transaction:**

| MODULE | UNIT | DESCRIPTION | HOURS |
|---|---|---|---|
| **1** | **MODULE TITLE: Basics of Content Management Systems** | | |
| | 1 | Introduction to CMS: Definition, purpose, importance, and benefits of using CMS. | **15** |
| | 2 | Types of CMS: Open Source, Proprietary, and Custom-built. | |
| | 3 | Features of CMS: Content creation, editing, publishing, workflows, and version control. | |
| | 4 | Advantages and limitations of CMS. | |
| | 5 | Examples of popular CMS platforms. Comparison of popular CMS platforms: WordPress, Joomla, Drupal. | |
| **2** | **MODULE TITLE: Components and functioning of CMS** | | |
| | 1 | CMS architecture: Frontend, Backend, Database. | **15** |
| | 2 | Core components: Content repository, templates/themes, plugins/extensions, admin interface. | |
| | 3 | User roles and permissions in CMS. | |
| | 4 | Content lifecycle: Creation, Storage, Publishing, Maintenance. | |
| | 5 | Security and performance considerations in CMS. | |
| **3** | **MODULE TITLE: Applications and Trends in CMS** | | |
| | 1 | Applications of CMS in websites, e-commerce, education, media, and enterprises. | **15** |
| | 2 | SEO and analytics support in CMS. | |
| | 3 | CMS in cloud and mobile environments. | |

| | | | |
|---|---|---|---|
| | 4 | Headless CMS: API-based content delivery. | |
| **4** | **MODULE TITLE: Introduction to WordPress** | | |
| | 1 | **Basics of WordPress:** Installation and setup of WordPress, Exploring the WordPress dashboard and interface, Understanding WordPress themes and templates. | **15** |
| | 2 | Content Creation and Management: Creating and publishing posts, pages, and media, organizing content with categories and tags, Using the WordPress editor for formatting, Incorporating multimedia (images, videos, audio). | |
| | 3 | Customization and Design: Customizing WordPress themes using HTML and CSS. | |
| **5** | **Teacher Specific Module** | | **15** |
| | ***Directions: The following exercises may be used as references for conducting lab experiments. This is not the final list of experiments for the practical examination. Additional experiments may be added to further enhance the practical skills of students.*** | | |
| | **List of Experiments**<br><br>1. **Installation and Setup of WordPress**<br>• Install WordPress on XAMPP/WAMP.<br>• Explore the dashboard and interface.<br>2. **Working with Themes**<br>• Understand and apply WordPress themes and templates.<br>• Switch between themes and observe changes.<br>3. **Creating and Publishing Content**<br>• Create posts, pages, and upload media files.<br>• Use categories and tags for content organization.<br>4. **Using the WordPress Editor**<br>• Format text and headings.<br>• Insert multimedia elements (images, videos, audio).<br>5. **Customization with HTML & CSS**<br>• Customize theme layout, colors, and fonts.<br>• Apply simple CSS styling to improve design. | | |

**Essential Readings:**


1. Nirav Mehta, “Choosing an Open-Source CMS: Beginner's Guide”, Packt Publishing Ltd, 2009.
2. Bob Boiko, “Content Management Bible”, 2nd Edition, Wiley Publishing, Inc., 2005.
3. Brad Williams, David Damstra, and Hal Stern, “Professional WordPress: Design and Development", Third Edition, Wrox, 2015.
4. Lisa Sabin & Wilson, “WordPress for Dummies”, 6th Edition, John Wiley & Sons, Inc., 2014.

5. Matthew MacDonald, “WordPress: The Missing Manual”, 3rd Edition, O'Reilly Media, 2020.

## ASSESSMENT RUBRICS

| Evaluation Type | | | Marks | Evaluation Type | | | Marks | Total |
|---|---|---|---|---|---|---|---|---|
| Lecture | | | 75 | Practical | | | 25 | |
| a) | ESE | | 50 | a) | ESE | | 15 | |
| | | | | | Program code and execution | | 8 | |
| | | | | | Output | | 3 | |
| | | | | | Viva | | 2 | |
| | | | | | Modification | | 2 | **100** |
| b) | CCA | | 25 | b) | CCA | | 10 | |
| | i | Test Paper | 5 | | i | Punctuality | 3 | |
| | | Model exam | 10 | | | | | |
| | ii | Assignment/ Book-<br>Article review /field report | 5 | | ii | Model Exam | 4 | |
| | iii | Seminar/ Viva-Voce | 5 | | iii | Record | 3 | |

# KU2DSCDAS107 INTERNET TECHNOLOGY

| Semester | Course Type | Course Level | Course Code | Credits | Total Hours |
|---|---|---|---|---|---|
| 2 | DSC | 100-199 | KU2DSCAIM107 | 4 | 60 |

| Learning Approach (Hours/ Week) | | | Marks Distribution | | | Duration of ESE (Hours) |
|---|---|---|---|---|---|---|
| Lecture | Practical/ Internship | Tutorial | CE | ESE | Total | |
| 4 | - | - | 30 | 70 | 100 | 2 Hrs |

**Course Description:** This course covers computer networks, internet protocols, web technologies, and advanced trends, with practical skills in web design using HTML.

**Course Prerequisite:** NIL

**Course Outcomes:**

| CO No. | Expected Outcome | Learning Domains |
|---|---|---|
| CO1 | Understand basic network types, topologies, and communication protocols. | U |
| CO2 | Identify key internet technologies and evaluate search strategies, email systems, and internet services. | An |
| CO3 | Understand recent advancements in internet and web technologies. | R, U |
| CO4 | Apply HTML to design simple and structured web pages using various tags and media elements. | A |

***Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)***

## Mapping of Course Outcomes to PSOs

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| **CO1** | **2** | **2** | | | |
| **CO2** | **2** | **2** | | | |
| **CO3** | **2** | **2** | | | |
| **CO4** | **2** | **2** | | | |

# COURSE CONTENTS

**Contents for Classroom Transaction:**

| M O D U LE | U N I T | DESCRIPTION | HOURS |
|---|---|---|---|
| **1** | **MODULE TITLE: Network Technology** | | |
| | 1 | Introduction to Computer Networks- Advantages of Networks, Goals of Networks. | **12** |
| | 2 | Types of Networks- LAN, MAN, WAN, Internet, Public Networks. | |
| | 3 | LAN topologies- Bus, Star, Ring, Mesh. | |
| | 4 | Interconnecting Issues, Types, Connectivity Devices- Hubs, Switch, Bridges, Routers. | |
| **2** | **MODULE TITLE: Web Pages** | | |
| | 1 | Introduction to WWW-WWW and HTTP, Webpage. | **12** |
| | 2 | Introduction to Web Browser- Bookmarks- Comparison, Directories. | |
| | 3 | Search Engines-Working and features-Search Strategies – Search Generalization-Search Specialization-Working. | |
| | 4 | Uniform Resource Locator (URL), Email-Working with Email Sending Mail-Reading Mail-Replying to Mail-Deleting Mail, Advantages and Disadvantages of Email. | |
| **3** | **MODULE TITLE: Internet Protocol** | | |
| | 1 | Introduction to Internet -Meaning of Internet. | **12** |
| | 2 | WWW- History, Working of Internet, Browsing, Searching the Web. | |
| | 3 | Internet protocols- TCP/IP Protocol suite, UDP, IP addresses, IP Versions – IPV4, IPV6. | |
| | 4 | Services of the Internet- FTP, HTTP, Email. | |
| **4** | **MODULE TITLE: Advanced Internet Technologies and Web Design using HTML** | | |
| | 1 | 3G, 4G, 5G Networks, Internet of Behaviours. | **12** |
| | 2 | Web Design using HTML: HTML- Understanding HTML, Text tags, Graphics, Video and Sound Tags; Link and Anchor Tags, Table Tags; Frame Tags, Miscellaneous tags (layers, image maps etc.). | |
| **5** | **Teacher Specific Module** | | **12** |

| | | |
|---|---|---|
| | ***Directions*** | |
| | *Use appropriate methodologies and evaluation metrics related with the topics.* | |

**Essential Readings:**


1. Raymond Greenlaw, Ellen Hepp, "Fundamentals of Internet and the World Wide Web, McGraw-Hill, 1998.
2. Laura Lemay, Rafe Colburn & Jennifer Kyrnin, "Mastering HTML, CSS & JavaScript Web Publishing", Paperback, BPB Publications, 2016.
3. Thomas a Powell, "HTML & CSS: The Complete Reference", Fifth Edition, Tata McGraw Hill.
4. Dr. Surender Jangra, "Basics of Internet and Web", Vayu Education of India. New Delhi, 110002.


## ASSESSMENT RUBRICS

| **Evaluation Type** | | **Marks** |
|---|---|---|
| End Semester Evaluation | | 70 |
| Continuous Evaluation | | 30 |
| a) | Test Paper- 1 | 5 |
| b) | Model Examination | 10 |
| c) | Assignment (2 numbers) | 10 |
| d) | Seminar | 5 |
| e) | Book/ Article Review | |
| f) | Viva-Voce | |
| g) | Field Report | |
| **Total** | | **100** |

## MULTI DISCIPLINARY COURSES(MDC)

# KU2MDCDAS102 DATA ANALYSIS USING EXCEL

| Semester | Course Type | Course Level | Course Code | Credits | Total Hours |
|---|---|---|---|---|---|
| 2 | MDC | 100-199 | KU2MDCDAS102 | 3 | 45 |

| Learning Approach (Hours/ Week) | | | Marks Distribution | | | Duration of ESE (Hours) |
|---|---|---|---|---|---|---|
| Lecture | Practical/ Internship | Tutorial | CE | ESE | Total | |
| **3** | **-** | **-** | **25** | **50** | **75** | **1.5Hrs** |

**Course Description:** This course provides a comprehensive introduction to Spreadsheets, focusing on understanding formulas, functions, data organization, analysis techniques, and data visualization. Participants will gain skills in spreadsheet management, data cleansing, analysis, and visualization using Excel's various tools and features.

**Course Prerequisite: NIL**

**Course Outcomes:**

| CO No. | Expected Outcome | Learning Domains |
|---|---|---|
| CO1 | Understand and apply basic Excel features, cell referencing, formulas, and commonly used functions for efficient data management. | U, A |
| CO2 | Perform data cleansing, validation, sorting, filtering, and organization to prepare accurate and structured datasets. | A, An |
| CO3 | Analyze data using advanced Excel tools such as Pivot Tables, What-if Analysis, Goal Seek, and Watch Window. | An, E |
| CO4 | Create and customize charts, Pivot Charts, dashboards, and form controls to effectively visualize and interpret data. | C, E |

***Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)***

## Mapping of Course Outcomes to PSOs

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| CO1 | 3 | | 3 | | 2 |
| CO2 | 3 | | 3 | | 2 |
| CO3 | 3 | | 3 | | 2 |
| CO4 | 3 | | 3 | | 2 |

## COURSE CONTENTS

**Contents for Classroom Transaction:**

| MODULE | UNIT | DESCRIPTION | HOURS |
|---|---|---|---|
| 1 | **MODULE TITLE: Introduction to Excel & Understanding Formulas, Functions** | | |
| | 1 | Features of Spreadsheet. | 9 |
| | 2 | Parts of Excel Window, Tool bars, Work sheet and Work book, Insertion and Deletion of cells, columns, rows. | |
| | 3 | Formatting in Excel (Merge, Warp, Font Formatting, Number Formatting, Borders and Shading, Colouring). | |
| | 4 | Range, Autofill, Autosum, Relative, Absolute and Mixed Referencing in Excel, Linking data between worksheets. | |
| | 5 | Formulas and Functions in Excel: Use of Formula Bar, Functions: SUM, ROUND, CEIL, FLOOR, IF, AND, OR, AVERAGE, MIN, MAX, COUNT, COUNTIF, SUMIF, VLOOKUP, HLOOKUP. | |
| 2 | **MODULE TITLE: Cleansing and Organising Data in Excel** | | |
| | 1 | Importance of Data Cleansing and Organisation. | 9 |
| | 2 | Data Import and Export. | |
| | 3 | Filtering and Sorting. | |
| | 4 | Data Validation and Remove Duplicates. | |
| | 5 | Group, Ungroup, Subtotal. | |
| | 6 | Conditional Formatting – Highlight Cell Rules, Top/Bottom Rules. | |
| 3 | **MODULE TITLE: Advanced Techniques for Data Analysis** | | |
| | 1 | Features of Pivot table. | 9 |

| | | | |
|---|---|---|---|
| | 2 | Pivot Table creation. | |
| | 3 | What-if Analysis. | |
| | 4 | Goal Seek. | |
| | 5 | Watch Window. | |
| **4** | **MODULE TITLE: Data Visualisation Techniques** | | |
| | 1 | Creating Charts, Different types of charts. | **9** |
| | 2 | Formatting Chart Objects, Changing the Chart Type, Showing and Hiding the Legend, Showing and Hiding the Data Table. | |
| | 3 | Pivot Chart. | |
| | 4 | Dashboards. | |
| | 5 | Form Controls. | |
| **5** | **Teacher Specific Module** | | **9** |
| | ***Directions: Provide practical oriented sessions including following activities.*** | | |
| | 1. Recording and Running Macros.<br>2. Protecting Data Sheets and Workbooks.<br>3. Split, Freeze and Hide options.<br>4. Add-ins.<br>5. Printing options in Excel. | | |

**Essential Readings:**


1. Michael Alexander and Richard Kusleika, "Excel 2019 Bible", 1st Edition, Wiley, 2018.
2. Ken Bluttman and Peter Aitken, "Excel Formulas & Functions for Dummies", John Wiley & Sons, 2005.
3. Michael R. Middleton, "Data Analysis Using Microsoft Excel", Cengage Learning, 2003.
4. Wayne Winston, "Microsoft Excel 2019 Data Analysis and Business Modeling",6th Edition, Microsoft Press, 2019.


## ASSESSMENT RUBRICS

| **Evaluation Type** | | **Marks** |
|---|---|---|
| End Semester Evaluation | | 50 |
| Continuous Evaluation | | 25 |
| a) | Test Paper- 1 | 5 |
| b) | Test Paper-2 | 10 |
| c) | Assignment | 5 |

| | | |
|---|---|---|
| d) | Seminar | 5 |
| e) | Book/ Article Review | |
| f) | Viva-Voce | |
| g) | Field Report | |
| **Total** | | **75** |

# KU2MDCDAS103 INTRODUCTION TO DIGITAL MARKETING

| Semester | Course Type | Course Level | Course Code | Credits | Total Hours |
|---|---|---|---|---|---|
| 2 | MDC | 100-199 | KU2MDCDAS103 | 3 | 45 |

| Learning Approach (Hours/ Week) | | | Marks Distribution | | | Duration of ESE (Hours) |
|---|---|---|---|---|---|---|
| Lecture | Practical/ Internship | Tutorial | CE | ESE | Total | |
| 3 | - | - | 25 | 50 | 75 | 1.5 Hrs |

**Course Description:** This course provides a comprehensive foundation in digital marketing, covering essential topics such as SEO, social media, email marketing, content strategy, paid advertising, web analytics, and emerging marketing trends. It equips learners with practical skills to plan, execute, and analyze digital campaigns for business success in the digital era.

**Course Prerequisite: NIL**

**Course Outcomes:**

| CO No. | Expected Outcome | Learning Domains |
|---|---|---|
| CO1 | Understand the fundamental concepts and importance of digital marketing. | U |
| CO2 | Apply content and social media strategies effectively across platforms. | A |
| CO3 | Implement SEO and paid advertising techniques to increase online visibility. | A |
| CO4 | Use analytics tools to measure, track, and improve marketing performance. | A |

***Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)***

## Mapping of Course Outcomes to PSOs

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| **CO1** | **3** | | **2** | | **2** |
| **CO2** | **3** | | **2** | | **2** |
| **CO3** | **3** | | **2** | | **2** |
| **CO4** | **3** | | **2** | | **2** |

# COURSE CONTENTS

**Contents for Classroom Transaction:**

| M O D U LE | U N I T | DESCRIPTION | HOURS |
|---|---|---|---|
| **1** | **MODULE TITLE: Digital Marketing Basics** | | |
| | 1 | Overview of digital marketing. | **9** |
| | 2 | Importance of digital marketing for businesses. | |
| | 3 | Introduction to key digital marketing channels (SEO, social media, email marketing). | |
| | 4 | Basics of creating a digital marketing strategy. | |
| **2** | **MODULE TITLE: Content Marketing & Social Media** | | |
| | 1 | Content Marketing Fundamentals. | **9** |
| | 2 | Content Strategy Development. | |
| | 3 | Content Creation for Different Platforms. | |
| | 4 | Introduction to Social Media Marketing & keyword Optimization. | |
| | 5 | Social Media Strategy & Community Management. | |
| **3** | **MODULE TITLE**: **Search Engine Optimization (SEO) & Paid Advertising** | | |
| | 1 | Introduction to Search Engine Optimization. | **9** |
| | 2 | On-page and Off-page SEO Techniques. | |
| | 3 | Search Engine Marketing (SEM) Fundamentals. | |
| | 4 | Pay-Per-Click (PPC) Advertising with Google Ads. | |
| | 5 | Social Media Advertising Platforms. | |
| **4** | **MODULE TITLE: Web Analytics & Emerging Trends** | | |
| | 1 | Introduction to Web Analytics & Key Metrics. | **9** |
| | 2 | Using Analytics Tools for Data-Driven Decision Making. | |
| | 3 | Conversion Tracking & Optimization. | |
| | 4 | Emerging Trends in Digital Marketing. | |
| | 5 | The Future of Marketing. | |
| **5** | **Teacher Specific Module** | | **9** |
| | ***Directions*** | | |
| | ***Use appropriate methodologies and evaluation metrics related with the topics.*** | | |

**Essential Readings:**


1. Ian Dodson, "The art of Digital Marketing", Wiley; ISBN:9781119265702, 2016.
2. Puneet Singh Bhatia, "Fundamentals of Digital Marketing", 2nd Edition, Pearson Education, 2019.


**Suggested Readings:**


1. Ryan, D., "Understanding Digital Marketing: Marketing Strategies for Engaging the Digital Generation", Kogan Page Limited, 2008.
2. Satinder Kumar, Supereet Kaur, "Digital Marketing", Taxmann Publications Private Limited, 2023.
3. Robert Hill, "Social Media Marketing 2024 - Mastering New Trends & Strategies for Online Success", Independently Published, 2023.


## ASSESSMENT RUBRICS:

| **Evaluation Type** | | **Marks** |
|---|---|---|
| End Semester Evaluation | | 50 |
| Continuous Evaluation | | 25 |
| a) | Test Paper- 1 | 5 |
| b) | Model Examination | 10 |
| c) | Assignment | 5 |
| d) | Seminar | 5 |
| e) | Book/ Article Review | |
| f) | Viva-Voce | |
| g) | Field Report | |
| **Total** | | **75** |