**P.R. GOVERNMENT COLLEGE (A), KAKINADA**

**(AN AUTONOMOUS COLLEGE WITH NAAC "A" GRADE)**

# Board of Studies Meeting for UG Programmes

# ELECTRONICS (Regular &Minor)

**2023 – 2024**

## DEPARTMENT OF PHYSICS & ELECTRONICS

**DEPARTMENT OF COLLEGIATE EDUCATION**
**GOVERNMENT OF ANDHRA PRADESH**

**PROCEEDINGS OF THE PRINCIPAL, PITHAPUR RAJAH's GOVT. COLLEGE[A]:: KAKINADA**
**Present: Dr. B.V. TIRUPANYAM,Ph.D.**

**Rc.No.1/ A.C/BOS/2023-24** **Dt.29 Aug2023**

Sub: P.R.G.C[A] – Academic Cell - **Conduct of BOS Meetings for the Academic Year2023-24** – Guidelines issued - Regarding.

Ref: Resolutions adopted in 25th Staff Council Meeting held on 29 Aug 2023

The Autonomous colleges are, as per its vision, mission, stated objectives and core values, mandated to design and develop their own outcome -based curricula keeping in view the societal, local and global industry requirements, employability and industry – ready and transferable skills duly prescribing Course Outcomes (COs), Programme Outcomes (POs) and Programme Specific Outcomes (PSOs) and suitable learning outcome assessment management system through robust and transparent evaluation system to measure their attainment levels by the students.

The Sustained Developmental Goals (SDG-4) of UNEP recommended assurance of quality to students in HEIs promoting creativity, critical thinking and collaborative skills, while building curiosity, courage, resilience and gender equality among students.

Further, the NEP-2020 recommended that the HEIs shall equip students with such skills that translate them into leaders and potential entrepreneurs too besides credit transfer mechanism through ABC (Academic Bank of Credits).

The HEIs are also, as per the Revised Accreditation Framework [RAF] of NAAC, endowed with the responsibility of rolling out quality and holistic human resources to the modern Indian Economy by ingraining quality in teaching- learning process by facilitating the students experience a wide range of participative and experiential learning strategies including field trips, conferences, integration of technology, community service programmes, career guidance, certificate and value added courses, research and inquisition based teaching, exchange programmes, gender equity programmes, etc.

Besides, the students shall have social consciousness, regard for constitutional provisions, right perspective on environmental protection, awareness on gender equity, health and hygiene, Yoga and wellness, college social responsibility, culture and values, etc., to mention a few.

Further, the Ministry of India, GoI, through NIRF, prescribes quality research, infrastructure augmentation, enhanced placement and progression to higher education, equipment of employability skills leading to enhanced public perception about the college among the public.

Our institution has, from AY 2022-23, has devised its new vision and mission along with objectives and core values necessitating design and re-orientation of its academic administration in tune with them.

**ORDER:**

In the light of the above mandate and responsibilities prescribed by institutions vision and mission, SDG-4, NEP – 2020, NAAC, NIRF to the autonomous HEIs, need to customize, design and re-orient their academic and research administration in tune with the policies of above bodies, our insitution is no exception.

Hence, the Chairmen of U.G and P.G Boards of Studies of various Departments are requested to make necessary arrangements for the conduct of the meetings on **31 August 2023**. They are further requested to prepare curricula and extracurricular activities and devise suitable evaluation system keeping in mind above recommendations to make students a wholesome personality and a 21st century student capable of facing challenges, adaptive to changes, creative and innovative.

Further, the Chairman of the each BOS, in association with the IQAC coordinator, preceding the BOS meeting, is requested to prescribe benchmarking, quality initiatives in pedagogy and learning; in design of curriculum (with 20% change) and optimum utilization of existing human, physical and ICT resources and adopt resolutions to the extent of benchmarks (As per SOP given in **Annexure – I)**. Further, as the regular attendance of students to the classes is a deciding factor in enhancement of quality in learning, a minimum attendance of 60% for I mid-term examination, 75% for II mid- term examination under CIA component shall be the benchmark for attendance and it shall be approved in the BOS. The Chairmen are also requested to approve the new programmes to be introduced for 2023-24, if any, number of certificate courses, their frequency, Bloom 's- Taxonomy based evaluation system for effective learning outcomes as per the Annexure – I.

The Chairmen are, therefore, requested to

- Design curricula of Odd and even semesters for the A.Y 2023-24 both for U.G and P.G courses intune with the stated vision, mission of the institution, RAF of NAAC, NEP-2020 and NIRF.
- Conduct meeting with employers, parents, alumni, shall take feedback on the existingcurricula andinvite suggestions and changes to be made.
- Invite the University nominee, subject experts, industrial nominees, student nominees, parents well in advance along with the date, venue, agenda, etc. A soft copy shall be communicated well in advance to the members to have an idea on the matters.
- Facilitate much room for intense deliberation on the design of the curricula, evaluation system, research component, enhancing learning experiences, resource utilization by staff

ad students, etc.,

- Each Department shall approve and recommend additional credits for additional modules, training programmes, N.S.S, N.C.C, participation in cultural programs, sports and games, environmental

  programs, blood donations camps, etc.
- All meetings shall be offline. Online attendance of members faculty will be permitted only in exceptional cases.
- The Chairmen shall submit minutes of the meeting in the prescribed format only (Annexure – II) in triplicate (hard copies) to the Academic cell for onward submission to the IQAC, Examination cell and library within three days from the completion of BOS meeting and besides hosting the soft copy in the college website within the period stipulated.
- Each Chairman of BOS, shall get the rough draft of the curricula verified and approved by the Principal, Academic Cell and IQAC before the actual BOS meetings to ensure uniformity and commensurate with the stated vision and mission of the college among the departments.
- The Academic Cell coordinator shall be the Chief Coordinator for the BOS meeting activity and IQACcoordinator will be the additional coordinator.
- The Academic Coordinator and IQAC coordinator conducted a meeting with the Chairmen, BOS on 28 August 2023 and explain the structure of curricula, uniformity other modalities.
- The Controller of Examinations of the institution shall fund the BOS meetings from the available funds on the condition of reimbursement after receiving autonomous funds from UGC. Initially, he shall pay Rs. 5,000/- uniformly as an advance to each Chairman towards each course (If BOS meetings for multiple courses are held under one Chairmanship, he/ she shall be given advance amount equivalent to the number of courses x Rs.500/-)
- The Chairman of each BOS shall apply to the principal for advance amount for meeting the BOS meetings with head-wise expenditure in the prescribed format (Annexure-III).

**Following contents shall be presented in the BOS document in order**

1. Proceedings of the Principal pertaining to BOS
2. Composition of BOS
3. Vision and Mission of the college
4. Agenda: It shall include ATR on the previous BOS meeting first, resolutions, etc., later.
5. Table showing the Allocation of Credits in the following table for

   both theory and Lab in case of science subjects

| S. No | Semester | Title of the Course (Paper) | Hrs./week | Max. Marks (SEE) | Marks in CIA | Credits |
|---|---|---|---|---|---|---|
| 1 | III | Optics | 4 | 50 | 50 | 4 |

6. Resolutions adopted in the meeting with detailed discussion that took place during the meeting (Activities and Bench marking as per Annexure –I)

7. At the end of each theory paper, each topic shall be mapped as per the Blooms taxonomy and scope of that topic for skill/ employability/ entrepreneurship opportunities in the following tableincorporated

| S. No | Subject | Semester | Title of the Course (Paper) | Topic | Parameter as per Blooms taxonomy ( Knowledge/ Application/ Creativity/ Innovation | Experiential learning component | Scope ( Skill/ employability/ entreprenuership) |
|---|---|---|---|---|---|---|---|
| 1 | III | Botany | Plant Physiology | Plant Cell | Knowledge | Shall be shown Microscope | |
| 2 | III | History | Tourism | Tourism management | Application | Apprenticeship | Employability |

8. Each BOS Chairman shall, immediately after syllabus, tabulate the changes made in the syllabus/paper along with justification, in the Proforma given in Annexure – I.
9. Attendance of Members present with signatures in the tabular form.
10. List of Examiners & Paper setters
11. Syllabus for each course (both theory & Practical in case of Science subjects) followed by model question papers (theory & practical) and allocation of CIA (50marks) for each course with structure.
12. Each student (2023-24 AB)has to complete one MOOCS course from SWAYAM in any subject peryear which is mandatory.

**CIA structure for Single Major system**

- Out of 50 marks for CIA, 25 marks are allocated for Mid examinations. In each semester two mid examinations to be conducted and the average of the two will be considered.
- I mid examination is to be conducted in offline mode at college level and II mid examination is to be conducted in online mode at department level.
- I mid examination to be conducted in offline mode in which the student should attempt **one essay** question for ten marks out of two questions, **two short** answer questions with five marks each out of four questions and five objective questions to be given for each paper.
- Question paper is to be given as per the following structure for the courses with **4 units**

| S.No | Unit No | Long Answer Question(10M) | Short Answer Question(5 M) | Objective Questions(1M) |
|---|---|---|---|---|
| 1 | I | 1 | 0 | 1 |
| 2 | II | 1 | 0 | 1 |
| 3 | III | 0 | 2 | 1 |
| 4 | IV | 0 | 2 | 1+ one question from anyunit with more syllabus weightage |

- For I mid examination to be conducted in offline mode, Question paper is tobegiven as per the following structure for the courses with **5 units**

| .No | Unit No | Long Answer Question( 10M) | Short Answer Question(5 M) | Objective Questions(1M) |
|---|---|---|---|---|
| 1 | I | 1 | 0 | 1 |
| 2 | II | 1 | 0 | 1 |
| 3 | III | 0 | 1 | 1 |
| 4 | IV | 0 | 1 | 1 |
| 5 | V | 0 | 1+ one question from any unit(III or IV or V) with more syllabus weightage | 1 |

- The remaining 25 marks for CIA are allocated as per the following structure.

| Project-10M | Viva on theory- 3M | Assignment- 5M | Seminar- 5M | Clean & green and Attendance- 2M |
|---|---|---|---|---|

**CIA structure for 3 Major system**

- Out of 50 marks for CIA, 25 marks are allocated for Mid examinations. In each semester two mid examinations to be conducted and the average of the two will be considered.
- I mid examination is to be conducted in offline mode at college level and II mid examination is to be conducted in online mode at department level.
- I mid examination to be conducted in offline mode in which the student should attempt **one essay** question for ten marks out of two questions, **two short** answer questions with five marks each out of four questions and five objective questions with one mark each.
- The remaining 25 marks for CIA are allocated as per the following structure.

| Project- 10M | Viva on theory- 3M | Assignment- 5M | Seminar- 5M | Clean & green and Attendance- 2M |
|---|---|---|---|---|

**CIA structure for 3 Major system for Honors programmes(2020-21AB)**

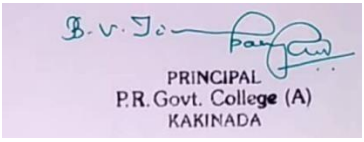
- Out of 40 marks for CIA, 20 marks are allocated for Mid examinations. In each semester two mid examinations to be conducted and the average of the two will be considered.
- I mid examination is to be conducted in offline mode at college level and II mid examination is to be conducted in online mode at department level.

- I mid examination to be conducted in offline mode in which the student should attempt **Two essay** questions for ten marks each out of three questions, **four short** answerquestions with five marks each out of six questions.

- The remaining 20 marks for CIA are allocated as per the following structure.

| | | |
|---|---|---|
| Assignment- 10M | Seminar- 5M | Quiz -5M |

13. Percentage of syllabus changes in each paper
14. Measure outcome attainment learning levels of students through direct and indirect methodology and mapping COs and POs
15. Text & Reference Books
16. e-content links.




PRINCIPAL

Pithapur Rajah's **GovernmentAutonomous College**
Kakinada

OFFICE OF THE DEAN, ACADEMIC AFFAIRS

**ADIKAVI NANNAYA UNIVERSITY**

RAJAMAHENDRAVARAM

No. ANUR/DAA/PR Govt. College (A)/Sub. Experts/2021 Date: 22-10-2021

**PROCEEDINGS OF THE VICE-CHANCELLOR**

**Sub:-** ANUR- DAA – Nominated University Subject Experts for BOS – PR Govt. College (A), Kakinada – Orders - Issued.

**Ref:-** 1. Lr. dated 15.09.2021, from the Principal, PR Govt. College (A), Kakinada
2.Proc. No: ANUR/PRG College (A), KKD/UG BoS/2019/09, dated 19.03.2019

**Read:-**Note for Orders of the Vice-Chancellor dated 21.10.2021

-oo0oo-

**ORDERS**

Having consider the request cited in the ref. 1, the Vice-Chancellor is pleased to order that the following members be nominated as University Subject Experts for UG Board of Studies of ***PR Govt. College (A), Kakinada*** for a period of three years from the date of the proceedings issued.

| S.No. | UG Courses | Name of the Subject Expert |
|---|---|---|
| 1 | English | Dr. Prasanthi Sree, AKNU MNS Campus, Kkd, Ph No: 9848297555, sathupathi.sri@gmail.com |
| 2 | Hindi | Dr. N Venkata Ramana, SKBR College, Amalapuram, Ph. No: 9849373773 |
| 3 | Telugu | Dr. P. Nagaraju, GDC, Palakollu, Ph.No: 9052038569, raju00517@gmail.com |
| 4 | Sanskrit | Dr. TGY Acharyulu, SKR Womens College, Rajahmundry, Ph. No: 9848628812 |
| 5 | Mathematics | Dr. V. Anantha Lakshmi, Principal, GDC Pithapuram, Ph. No : 9963786386, ananthamaths@rediffmail.com |
| 6 | Statistics & Actuarial Sciences | Dr. D V Ramana Murthy, HoD of Statistics, SKVT College, Rajamahendravaram, Ph.No: 9949135864, drdvrmurthy@gmail.com |
| 7 | Chemistry & Analytical Chemistry | Dr. K. Jhansi Lakshmi, Principal, Ideal College of Arts & Sciences, KKD, Ph.No: 9441236409, jhansikalisindi@gmail.com |
| 8 | Physics & Electronics | Dr. Paul Diwakar, Sri CRR College (A), Eluru, 9985050696 |
| 9 | Petro Chemicals | Dr. M Trinadh, Lecturer in Chemistry, Govt. College (A), Rajahmundry, Ph. No: 8639551783 |
| 10 | Bio-Chemistry | Dr. M Suvarchala, Lecturer in home science, ASD women's Degree College, KKD, Ph. No: 9346512694, suvarchakamallela@gmail.com |
| 11 | Food Science | |
| 12 | Botany | Dr. J. Sujatha, Leturer in Botany, GDC Rjy, Ph.No: 9441050910, drjsuneetha@gcrjy.ac.in |
| 13 | Microbiology | Dr. D Aruna, Lecturer in Micro-biology, ASD Women's College, Kakinada, Ph. No: 9182525872 |
| 14 | Zoology | Dr. B. Tejo Murthy, Lecturer in Zoology, GDC Yeleswaram, Ph. No: 9703799970, drmtm2011@gmail.com |
| 15 | Bio Technology | Dr. B. Nageswari, Lecturer in Biotechnology, GDC Rjy, Ph. No: 986621955 |

## Proceedings of the Principal, Pithapur raja's Government College [A], Kakinada

**Present: Dr.B.V Tirupanyam, M.Sc, Ph.D**

**Rc. No: 12A/A.C/BOS 2023-24,Dated:31.08.2023**

**Sub:-** Pithapur raja's Government College [A], Kakinada – UG Boards of Studies (BoS) – Program Course- B.Sc/ELECTRONICS Nomination of members - Orders Issued.

**Ref:-** UGC Guidelines for Autonomous colleges- 2018.

**ORDER:**

The Principal, Pithapur raja's Government College [A], Kakinada is pleased to constitute UG **Board of studies in ELECTRONICS** for framing the syllabi in ELECTRONICS subject for all semesters duly following the norms of the UGC Autonomous guidelines.

| S. No | Name of the Nominee | Designation |
|---|---|---|
| 1. | Smt.M.Surekha<br>Head of the Department | Chairman |
| 2. | Dr.P.Paul Diwakar | University nominee,<br>Y.V.N.R Government college,Kaikaluru |
| 3. | Dr.K.Jyothi | Subject Expert, Principal<br>SVRKGDC(M),Nidadavolu |
| 4. | SrI.B.Gangadharudu | Subject Expert,Lecturer in Electronics,MR government college |
| 5. | Sri.B.Sudarshan | Representative from Industry, Andhra Electronics,Kakinada |
| 6. | Dr.K.Nanda Gopal | Sr.Scientific Asst.IMD,Alumni |
| 7. | Dr.K.Jayadev | Member |
| 8. | Ms G. Sridevi | Member |
| 9. | Smt.A.Padmavathi | Member |
| 10. | Dr S V G V A Prasad | Member |
| 11. | Sri P Himakar | Member |
| 12. | Sri K. Durga Rao | Member |
| 13. | Ms.V.Sireesha | Member |
| 14. | N.Mahalakshmi | Student Member-II MPE |
| 15. | G.Asha latha | Student Member-II MPE |

The above members are requested attend the BOS meeting on 31-08-2023 and share their valuable views, suggestions on the following functionaries:

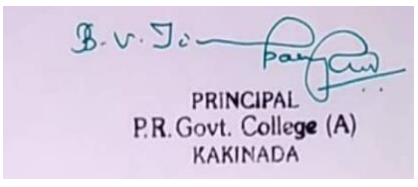
(a) Prepare syllabi for the subject keeping in view the objectives of the college, interest of the stake holders and national requirement for consideration and approval of the Academic Council

(b) Suggest methodologies for innovate teaching and evaluation techniques

(c) Suggest panel of names to the Academic council for appointment of examiners

(d) Coordinate research, teaching, extension and other activities in the department of the college.

The term of the members will be two years from the date of the nomination. The Chairman of the BoS (HoD/lecturer In-Charge of the department) is directed to coordinate with the Principal of the College and conduct BoS meetings as and when necessary, but at least once a year.



## Vision & Mission of the College

***VISION***: To contribute its might for holistic and quality human capital formation for modern economy with focus on developing employment opportunity – enhancing skilling ecosystem, through integration of research, value system and technology into teaching – learning process.

***MISSION***:

- To provide conducive and outcome-based skill development environment in the institution to brighten prospects for progression to higher education, employment opportunities in Government and Private agencies, for personal growth and enhanced productivity and economic growth.
- To collaborate with coaching centers or skill development institutions for skill development.
- To develop systems for quality enhancement in learning by student through promotion of ICT integration into learning, deployment of learning resources at the door steps of students for optimum utilization.
- Designing and implementing student-centric, inquisitive, practical-rich and research based curricula, including project works, problem-solving & applications oriented TLPs, field trips, etc., that facilitate experiential and participative learning.
- To strengthen research and development and create new research knowledge through intense research, collaborations, knowledge and technology transfer.
- To foster innovation among students through trainings and forging collaborations with outside organizations
- To turn each student into a wholesome personality through initiatives in Community Service, Gender equity initiatives, Environment protection, personality development, transferable skills, understanding constitution and its spirit and their role in nation building.
- To mould the character of each constitutional provisions-abiding and inquisition-arousing

**P.R. GOVT.COLLEGE (A), KAKINADA DEPARTMENT OF PHYSICS & ELECTRONICS**
**Board of Studies – Electronics**

**Meeting held on: Dt. 30 – 08 – 2022 (Monday)** **Time: 10:30am.**

**At: Department of Physics & Electronics staff room**

# Agenda of the Meeting

To discuss and approve:

1. Action taken report (ATR) of the A.Y.2022-23
2. Revised- Minor, common program structure and semester wise curriculum.
3. Adoption of regulations on scheme of examination and marks/grading system.
4. Engaging of $7^{th}$ hour of time table
5. Streamlining of regularity in attendance.
6. Value added courses viz. add on courses and skill development courses to be conducted by the department during the academic year 2023-24.
7. Collaboration with industry and third party sector organization in view of industrial internship.
8. Make students access to ICT infrastructure for enhanced quality in higher education.
9. Remedial coaching for slow learners and project/ research work for advanced learners
10. Allocation of extra credits for extracurricular activities.
11. List of equipment/software requirement for each lab/practical of **Semester-V**.
12. Conduct of parent teacher meeting.
13. Panel of Question paper setters and Examiners
14. Action plan for the academic year 2023-24.
15. Departmental budget proposal for the academic year 2023-24
16. Any other with the permission of the chair.

**P.R. Government College (Autonomous), KakinadaDepartment of Physics and Electronics**

**BOARD OF STUDIES - PHYSICS**

***Resolutions of the Meeting***

The Board of Studies meeting was convened by the Physics & Electronics Department on 30-08-2023 at 10:30am. under the chairmanship of M.Surekha, In-charge of the department, Dr. P. Paul Divakar, University Nominee, Sri. D. Gangadharudu, Subject expert, all members of the faculty of Physics & Electronics and student representatives attended the meeting. The following agenda items are discussed and resolutions are made

**Agenda-1**: Action taken report (ATR) of the A.Y.2022-23.
**Proposal**: Presented before the BOS members to discuss on the above agenda 1.
**Discussion**: Discussed the action taken report (ATR) of the A.Y.2022-23.
**Resolution Adopted:** Appreciated and approved as all the activities were successfully completed in the proposed time line.

**Agenda-2:** Revised-Minor, common program structure and semester wise curriculum.
**Proposal**: Placed before the BOS members to discuss on the above agenda 2.
**Discussion**: Discussed the entire program structure
**Resolution Adopted:** Resolved to adopt the revised Minor, common program structure and verified course wise syllabi as per guidelines issued by APSCHE and ANUR. Also discussed and approved the revised course wise structure, Syllabi, Blue print and model papers of **Semesters I – V** for the academic year 2023-24.

**Agenda-3:** Adoption of regulations on scheme of examination and marks/grading system.
**Proposal**: It is put before the BOS members to discuss on the above agenda 3.
**Discussion**: Discussed the Continuous Internal Assessment (CIA): Examination pattern.
**Resolution Adopted:** Approved the Mode of internal assessment, pattern of examination of internal assessment and scheme of evaluation of practical exams .
of Semesters I-IV as external 50Marks and internal assessment 50Marks. For all LSCs and SDCs has no internal assessment. All the practical classes of Semesters I-V will be conducted for 2 Hrs.

It is resolved to approve the split up of Continuous Comprehensive Evaluation CCE – 50 Marks for **Semesters I-IV** as follows:

| Examination | Mode of Assessment | Marks allotted |
|---|---|---|
| **(CIA)** Continuous Internal Assessment SEM I-IV | Student study Project | 10 |
| | Viva Voce | 10 |
| | Seminar and Group Discussion | 5 |
| | Average of 2 Mid examinations conducted @25marks | 25 |
| **TOTAL MARKS** | | **50** |

- It is resolved to conduct one pre-final examination for I, II & III year students.
- Discussed and approved the scheme of evaluation of practical examinations for all the I – V semesters.
- It is resolved to approve the conduct of semester end practical exams only with internal examiners for odd semester and with both internal and external examiners for even semesters at the end of each semester.
- Resolved and approved the blue print, model papers of semester end examinations for all the I – V semesters.

**Agenda-4**: Engaging of 7th hour of time table

**Proposal**: It is Presented before the BOS members for discussion on this agenda point

**Discussion:** Discussed the engagement of 7th hr introduced by the authorities

**Resolution Adopted**: It is resolved to dedicate the 7th hour classes for extra-curricular activities and student counseling by class mentors.

**Agenda-5: S**treamlining of regularity in attendance.

**Proposal**: It is put before the BOS members to discuss the above agenda point 5.

**Discussion:** Discussed the measures to be taken for improving the regularity of thestudent

**Resolution Adopted:** Resolved to make the **75% of attendance is mandatory** to appear for both the internals **1st and 2nd mid-term examinations** and also it is resolved that the student should attend at least one internal exam to appear for the Semester end examination.

**Agenda-6**: Certificate courses viz. add on courses and skill development courses to be conducted by the department during the academic year 2023-24.

**Proposal**: It is placed before the BoS members to discuss on the above agenda 6.

**Discussion**: Discussed the LSCs and SDCs to be included.

Resolutions Adopted:

- Resolved to adopt Community Service Project for all the students at the end of **Sem –II**.

**Agenda-7:** Collaboration with industry and third party sector organisation in view of industrial internship.

**Proposal**: It is placed before the BoS members to discuss on the above agenda 7.

**Discussion**: Discussed on collaboration with industry and third party sector organisation in view of industrial internship.

Resolutions Adopted:

- Resolved to send all the final year Physics and Electronics students for on job training apprenticeship in connection with industries for off-site Project in the end of **Sem V/VI with the following industries** in accordance with their interest of study.

| S . No. | NAME OF THE INDUSTRY | LOCATION | NATURE OF SKILLS AIMED TO BE |
|---|---|---|---|
| 1 | ISIE India Pvt. Ltd., Noida | Kakinada | Electronic vehicle technology |
| 2 | JVS Technologies | Kakinada | Electronic devices manufacturing and repairs |
| 3 | Solar Systems | Kakinada | Installation of Solar panels |
| 4 | Ramakrishna Rewinding Works | Kakinada | Rewinding of Electrical appliances |

**Agenda-8:** Make students access to ICT infrastructure for enhanced quality in higher education.

**Proposal**: It is placed before the BoS members to discuss on the above agenda 8.

**Discussion**: Discussed on making the students access to ICT infrastructure for enhanced quality in higher education.

**Resolutions Adopted**: By identifying various modules and topics for ICT platform and to develop e-content in 4- quadrants method to the students and upload in the college website.

**Agenda-9:** Remedial coaching for slow learners and project/ research work for advanced learners

**Proposal**: It is placed before the BoS members to discuss on the above agenda 9.

**Discussion**: Discussed on remedial coaching for slow learners and project/ research work for advanced learners.

**Resolutions Adopted:** Resolved to adopt a bench mark from previous appeared examinations to divide the students into three categories

- Resolved to take '**O'** as benchmark for advanced learners to assign critical assignments, project/research works and ICT based class seminars
- Resolved to take '**B'** as benchmark for moderate learners to assign assignments and class seminars
- Resolved to take '**F'** as benchmark for slow learners to conduct remedial coaching

**Agenda-10**: Allocation of extra credits for extracurricular activities.

**Proposal**: It is presented before the BOS members to discuss on the above agenda10.

**Discussion**: Discussed the allocation of extra credits for extracurricular activities.

**Resolution Adopted**: Approved to give extra credits for MOOCS courses, N.S.S., N.C.C., winners of zonal level sports and games competitions, participation in state level/ National level competitions, blood donations camps, environmental programs like extending services in facing the natural calamities etc. as mentioned in the following table.

| Sl. No. | Activity | Details of achievement | Credits |
|---|---|---|---|
| 1 | **MOOC Course** | SWAYAM /NPTEL /CEC etc., (Course Completion certificate with credits should be produced for the claim of extra credits ) | Total credits achieved will be considered |
| 2 | **NCC** | B CERTIFICATE | 2 |
| | | Participation in National Camp after 'B' certificate | 3 |
| | | C certificate | 4 |
| | | Adventure camp/RD parade along with 'B' | 5 |
| | | Failed in B certificate Examination | 1 |
| 3 | **Sports** | Intercollegiate selection | 2 |
| | | South zone selection | 3 |
| | | All India participation | 4 |
| | | Winning medals in all India competitions | 5 |
| 4 | **NSS** | 40% attendance in regular NSS activities | 1 |
| | | 50% attendance with Community Service | 2 |
| | | Conduct of survey/Youth exchange/RD | 3 |
| 5 | **JKC** | Enrollment and training | 1 |
| | | Campus recruitment local level | 2 |
| | | MNCs/reputed companies | 3 |
| 6 | **Community service** | Participation in community service by departments (outreach programmes) | 2 |
| 7 | **Cultural activity** | Winning medals at state level-2,<br>District level-1 | 2<br>1 |
| 8 | **COP/Add on Course** | Pass in Certificate Exam-1,<br>Diploma-2 | 1<br>2 |
| 9 | **Support services** | Lead India, Health club, RRC and EcoClub etc., participation in various programmes | 1 |

**Agenda-11:** List of equipment/software requirement for each lab/practical of **Semester-V**.**Proposal**: Placed before the BOS members to discuss on this agenda point 11.
**Discussion**: Discussed the requirement for each lab/practical of **Semester-V**.
**Resolution Adopted**: Approved and resolved to purchase the needy equipment, which aresuggested after discussion.

**Agenda-12:** Conduct of parent teacher meeting.
**Proposal**: It is presented before the BOS members for the discussion on this agenda point12
**Discussion**: Discussed the conduct of parent teacher meeting
**Resolution Adopted**: Approved and resolved to conduct parent teacher meeting twice inthe academic year at each semester and to make them aware of their role as stakeholdersin the college administration.

**Agenda-13:** Panel of examiners to be approved in BOS. **Proposal**: It is presented before the BOS members to discuss on the above agenda 13.
**Discussion**: Discussed the panel of Question paper setters and examiners.
**Resolution Adopted**: Approved and resolved.

**Agenda-14:** Action plan for the academic year 2023-24.
**Proposal**: It is put before the BOS members to discuss on the above agenda 14.
**Discussion**: Discussed the action plan to implement the departmental activities moreeffectively as per the plan.
**Resolution Adopted**: It is resolved to approve Department Action Plan for the AcademicYear 2023-24.

**Agenda-15:** Departmental budget proposal for the academic year 2023-24
**Proposal**: It is presented before the BOS members to discuss on the above agenda 15.
**Discussion**: Discussed the budget proposal
**Resolution Adopted**: Approved the budget proposal for the academic year 2023-24.

## P. R. Government College (Autonomous), Kakinada

## DEPARTMENT OF PHYSICS

## Board of Studies Meeting 2023-24

## Action Taken Report

The Department of Physics conducted the BOS meeting for the academic year 2022-23 on 31.10.2022 in the Department of Physics. All the activities according to the plan of action were successfully completed in the proposed timeline. By taking the valuable recommendations of the members for enhancement of knowledge and to enrich the skills of the students, the department took initiatives and implemented various innovative steps viz.

1. Post admission test was conducted on 11.11.2022.
2. Distribution of money under the Upkar Scheme was held on 14-07-2022.
3. A field visit was conducted to the India Meterogilcal Department on 12-09-2022.
4. International day for preservation of the ozone layer was conducted on 16-09-2022.
5. Started an add on certificate course "Applications of Solar Cells in Home Energy Systems" in Sem IV @30 hrs. for 2 credits having 5units@ 2 theory hrs. per week and one Study Project at the end of the course.
6. Started a skill enhancement certificate course "Soldering and Desoldering of Components" in Sem IV @30 hrs. for 2 credits having 5units@ 2 theory hrs. per week and one Study Project at the end of the course.
7. Energy Audit in The Campus was conducted during the period 15-11-2022 TO 18- 11-2022.
8. Microwave Oven Day was conducted on 16-12-2022.
9. Distribution Of Kasarabada Scholarships was conducted on 06-02-2023.
10. **National Science Day** was conducted on **28-02-2023.**
11. **Zero Shadow Day** was conducted on **07-05-2023.**
12. **Chandrayaan 3 Live LaunchingProgram was conducted on 14-07-2023.**
13. Guest Lecture on Electronics and Electronic Devices was conducted on **17-06-2023.**

14. National Seminar On “Novel Materials, Nanotechnology and Biomedical Applications" was conducted on 15-07-2023.
15. Seminar On Rocket-SatelliteTechnology was conducted on 24-07-2023.
16. Chandrayaan 3 Live Landing Programme was conducted on 23-08-2023.
17. Started “Centre for Innovation an.d Incubation Centre” for innovative projects on the platform of ‘Atal Tinkering Labs’
18. Installation of “Solar Tree” in before the Physics Block is in process

P.R. Government College (Autonomous), KakinadaDepartment of Physics and Electronics

UG Program (4 years Honors) Structure (CBCS)

# 2020-21 A.Y., onwards Up to 2023-24.

## BACHLOR OF SCIENCE

($3^{rd.}$ and $4^{th}$ year detailed design will be followed as per APSCHE GUIDELINES)

| Subjects/ Semesters | | I | | II | | III | | IV | | V | | VI | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | H/ W | C | H/W | C | H/W | C | H/W | C | H/ W | C | H/ W | C | | |
| **Languages** | | | | | | | | | | | | THIRD PHASE of APPRENTICESHIP Entire 5th / 6th Semester | | FIRST and SECOND PHASES (2 spells) of APPRENTICESHIP between 1st and 2nd year and between 2nd and 3rd year (two summer vacations). | |
| English | | 4 | 3 | 4 | 3 | 4 | 3 | | | | | | | | |
| Language (H/T/S) | | 4 | 3 | 4 | 3 | 4 | 3 | | | | | | | | |
| Life Skill Courses | | 2 | 2 | 2 | 2 | 2+2 | 2+2 | | | | | | | | |
| Skill Development Courses | | 2 | 2 | 2+2 | 2+2 | 2 | 2 | | | | | | | | |
| **Core Papers** | | | | | | | | | | | | | | | |
| M-1 | C1 to C5 | 4+2 | 4+1 | 4+2 | 4+1 | 4+2 | 4+1 | 4+2<br>4+2 | 4+1<br>4+1 | | | | | | |
| M-2 | C1 to C5 | 4+2 | 4+1 | 4+2 | 4+1 | 4+2 | 4+1 | 4+2<br>4+2 | 4+1<br>4+1 | | | | | | |
| M-3 | C1 to C5 | 4+2 | 4+1 | 4+2 | 4+1 | 4+2 | 4+1 | 4+2<br>4+2 | 4+1<br>4+1 | | | | | | |
| M-1 | SEC (C6,C7) | | | | | | | | | 4+2<br>4+2 | 4+1<br>4+1 | | | | |
| M-2 | SEC (C6,C7) | | | | | | | | | 4+2<br>4+2 | 4+1<br>4+1 | | | | |
| M-3 | SEC (C6,C7) | | | | | | | | | 4+2<br>4+2 | 4+1<br>4+1 | | | | |
| **Hrs/ W (Academic Credits)** | | 30 | 25 | 32 | 27 | 32 | 27 | 36 | 30 | 36 | 30 | 0 | 12 | 4 | 4 |
| Project Work | | | | | | | | | | | | | | | |
| **Extension Activities (Non Academic Credits)** | | | | | | | | | | | | | | | |
| **NCC/NSS/Sports/Extra-Curricular** | | | | | | | | | 2 | | | | | | |
| **Yoga** | | | | | | | 1 | | 1 | | | | | | |
| Extra Credits | | | | | | | | | | | | | | | |
| **Hrs/W (Total Credits)** | | 30 | 25 | 32 | 27 | 32 | 28 | 36 | 33 | 36 | 30 | 0 | 12 | 4 | 4 |

M= Major; C= Core; SEC: Skill Enhancement Courses

# P.R. Government College (Autonomous), Kakinada

Marks & Credits Marks & Credits

| Sl. No | Course type | No. of courses | Each course teaching Hrs/wk. | Credit for each course | Total credits | Each course evaluation | | | Total marks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Conti-Assess | Univ-exam | Total | |
| 1 | English | 3 | 4 | 3 | 9 | 50 | 50 | 100 | 300 |
| 2 | S. Lang | 3 | 4 | 3 | 9 | 50 | 50 | 100 | 300 |
| 3 | LS | 4 | 2 | 2 | 8 | 0 | 50 | 50 | 200 |
| 4 | SD | 4 | 2 | 2 | 8 | 0 | 50 | 50 | 200 |
| 5 | Core/SE -I | 5+2 | 4+2 | 4+1 | 35 | 50 | 50+50 | 150 | 1050 |
| | Core/SE -II | 5+2 | 4+2 | 4+1 | 35 | 50 | 50+50 | 150 | 1050 |
| | Core/SE -III | 5+2 | 4+2 | 4+1 | 35 | 50 | 50+50 | 150 | 1050 |
| 6 | Summer-Intern | 2 | | 4 | 8 | | 100 | 200 | 200 |
| 7 | Internship/ Apprentice/ on the job training | 1 | | 12 | 12 | | 200 | 200 | 200 |
| | | **38** | | | **159** | | | | **4550** |
| 8 | **Extension Activities (Non Academic Credits)** | | | | | | | | |
| | **NCC/NSS/Sports/ Extra-Curricular** | | | **2** | **2** | | | | |
| | **Yoga** | **2** | | **1** | **2** | | | | |
| | Extra Credits | | | | | | | | |
| | **Total** | **40** | | | **163** | | | | |

**DETAILS OF COURSE TITLES & CREDITS** **Admitted batch(2022 - 23)**

| Sem | Course no. | Course Name | Course type (T/L/P) | Hrs./ Wk. (Science: 4+2) | Credits (Science : 4+1) | Max. Marks Cont./Internal/Mid Assessment | Max. Marks Sem-end Exam |
|---|---|---|---|---|---|---|---|
| I | 1 | Circuit theoryand electronic devices | T | 4 | 4 | 50M | 50M |
| | 1 P | Practical course -1 | L | 2 | 1 | 0 | 50M |
| II | 2 | Digital Electronics | T | 4 | 4 | 50M | 50M |
| | 2 P | Practical Course - 2 | L | 2 | 1 | 0 | 50M |
| III | 3 | **Analog circuits and communication** | T | 4 | 4 | 50M | 50M |
| | 3 P | Practical Course - 3 | L | 2 | 1 | 0 | 50M |
| IV | 4 | Microprocessor systems | T | 4 | 4 | 50M | 50M |
| | 4 P | Practical Course - 4 | L | 2 | 1 | 0 | 50M |
| | 5 | Microcontroller & Interface | T | 4 | 4 | 50M | 50M |
| | 5 P | Practical Course -5 | L | 2 | 1 | 0 | 50M |
| V | 6A | Industrial Electronics | T | 4 | 4 | 50M | 50M |
| | | Industrial Electronics Lab | L | 2 | 1 | 0 | 50M |
| | 7A | Electronic Instrumentation | T | 4 | 4 | 50M | 50M |
| | | Electronic Instrumentation Lab | L | 2 | 1 | 0 | 50M |
| | OR | | | | | | |
| | 6B | Embedded systems design | T | 4 | 4 | 50M | 50M |
| | | Embedded systems design Lab | L | 2 | 1 | 0 | 50M |
| | 7B | Consumer Electronics | T | 4 | 4 | 50M | 50M |
| | | Consumer Electronics Lab | L | 2 | 1 | 0 | 50M |
| | OR | | | | | | |
| | 6C | VLSI Design | T | 4 | 4 | 50M | 50M |
| | | VLSI Design Lab | L | 2 | 1 | 0 | 50M |
| | 7C | Data communication and Networking | T | 4 | 4 | 50M | 50M |
| | | Data communication and Networking Lab | L | 2 | 1 | 0 | 50M |

Note: *Course type code: T: Theory, L: Lab

## DETAILS OF COURSE TITLES & CREDITS Admitted batch (2023 - 24)

| Sem | Course no. | Course Name | Course type (T/ L/P ) | Hrs./ Wk. (Science: 3+ 2) | Credits (Science : 3+1) | Max. Marks Cont./Internal/Mid Assessment | Max. Marks Sem-end Exam |
|---|---|---|---|---|---|---|---|
| II | Minor-1 | Fundamental of Electricity and Electronics | T | 3 | 3 | 50M | 50M |
| | Minor-1P | Fundamental of Electricity and Electronics | P | 2 | 1 | 0 | 50M |

**Note 1: For Semester–V,** for the domain subject **ELECTRONICS**, any one of the three pairs of Skill Enhancement Courses shall be chosen as courses 6 and 7, i.e., 6A & 7A or 6B & 7B or 6C & 7C. The pair shall not be broken (ABC allotment is random, not on any priority basis).

**Note 2:** One of the main objectives of Skill Enhancement Courses (SEC) is to inculcate field skills related to the domain subject in students. The syllabus of SEC will be partially skill oriented. Hence, teachers shall also impart practical training to students on the field skills embedded in the syllabus citing related real field situations.

**Note 3:** To insert assessment methodology for Internship / on the Job Training / Apprenticeship under the revised CBCS as per APSCHE Guidelines.

**First internship (After 1st Year Examinations):** Community Service Project. To inculcate social responsibility and compassionate commitment among the students, the summer vacation in the intervening 1st year of study shall be for Community Service Project (the detailed guidelines are enclosed).

- **Credit For Course: As per APSCHE and AKNU guidelines.( for 2023-24 admitted batch)**

- **Examples of community service project offered by the department**
- Consumption of solar energy in industrial sector Survey of electricity consumption on primary needsEffect of social media on society
- Impact of online payments in daily life Urge of Internet for education purpose Utilization ofsolar energy in public sector Effect of social media on society Recommendations for energy saving houses
- Utilization of solar energy in Kakinada Smart cityEnergy saving techniques in houses

- **Second Internship (After 2nd Year Examinations):** Apprenticeship / Internship

/ on the job training / In-house Project / Off-site Project. To make the students employable, this shall be undertaken by the students in the intervening summer vacation between the 2nd and 3rd years (the detailed guidelines are enclosed).

- **Credit For Course: 04 for 100 marks( for 2022-23 admitted batch)**

- **Third internship/Project work (6th Semester Period):**

  During the entire 6th Semester, the student shall undergo Apprenticeship / Internship / On the Job Training. This is to ensure that the students develop hands on technical skills which will be of great help in facing the world of work (the detailed guidelines are enclosed).

- **Credit For Course:12 for 200 marks( for 2021-22 admitted batch)**

# P.R. Government College (Autonomous), Kakinada

Department of Physics& Electronics

Proposed Skill Enhancement Courses from the Department of Physics & Electronics :

- For **Sem III**, one Add on certificate course "**Soldering and De-soldering** " with 30 hrs. duration for 2 credits having 4units@ 2 theory hrs. per week and one Study Project at the end of the course was designed by the Department.

- For **Sem IV**, in accordance with the prescribed on job training apprenticeship, all the Physics and Electronics students are supposed to connect with the following industries for off-site Project.

| S. No. | NAME OF THE INDUSTRY | LOCATION | NATURE OF SKILLS AIMED TOBE |
|---|---|---|---|
| 1 | ISIE INDIA PVT. LTD., Noida | Kakinada | Electronic vehicle technology |
| 2 | JVS Technologies | Kakinada | Electronic devices manufacturingand repairs |
| 3 | Solar Systems | Kakinada | Installation of Solar panels |
| 4 | Ramakrishna Rewinding Works | Kakinada | Rewinding of Electrical appliances |

➢ List of Suitable levels of positions eligible in the Govt /Pvt organizations

Suitable levels of positions for these graduates either in industry/govt organization like., technical assistants/ scientists/ school teachers., clearly define them, with reliable justification

| S. No | Position | Company/ Govt. organization | Remarks | Additional skills required, if any |
|---|---|---|---|---|
| 1 | Clerk | IBPS | | Skill in functional English, and aptitude. |

| | | | | |
|---|---|---|---|---|
| 2 | SSC | Central Govt. | | Skill in functional English, and aptitude with GK. |
| 3 | Asst. Programmer | MNC (Software Companies) | | Skill in functional English, and aptitude and expected domain skills |
| 4 | Technical Assistant | Pharma Companies | Chemistry background student | Along with aptitude and English, domain skills. |

P.R. Government College (A), Kakinada
Blue print for the model paper – Electronics
Semester End External examination
For I , II &III year core courses
2023 – 2024

| S. No. | Type of question | Given in the Question paper | | | To be answered | | |
|---|---|---|---|---|---|---|---|
| | | No. of Questions | Marks allotted To each question | Total marks | No. of Questions | Marks allotted To each question | Total marks |
| 1 | Section – A Essay question | 6 | 10 | 60 | 3 | 10 | 30 |
| 2 | Section – B Short answer Question | 7 | 5 | 35 | 4 | 5 | 20 |
| **TOTAL** | | | | **95** | | | **50** |

**Percentage of Choice given** $= \frac{95-50}{95} x\ 100$

$= \frac{45}{95} x\ 100 \quad = 47.4\ \%$

**P.R. Government College (A), Kakinada**

**Blue Print for Internal Theory Examination**

**For Single Major system**

| S. No. | Type of question | Unit | No. of Questions | No. of Questions Given | | | No. of Questions to be answered | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Total Quetions | Marks allotted To each question | Total marks | No. of Questions | Marks allotted To each question | Total marks |
| 1 | **Section – A** Essay question | I | 1 | 2 | 10 | 20 | 1 | 10 | 10 |
| | | II | 1 | | | | | | |
| 2 | **Section – B** Short answer Questions | III | 2 | 4 | 5 | 20 | 2 | 5 | 10 |
| | | IV | 2 | | | | | | |
| 3 | **Section – C** Objective type questions | One question from each unit | | 5 | 1 | 5 | 5 | 5 | 5 |
| **TOTAL** | | | | | | **45** | | | **25** |

Percentage of Choice given = $\frac{\mathbf{45-25}}{\mathbf{45}}$ X 100 = 44.44 %

The total of two internals is reduced to 25 marks and the other 25 marks allocated forCCE are further divided as follows

Study project = 10 marks
(Theoretical for odd Sem / Practical for even Sem)

Viva on subject =3 marks

Assignment = 5marks

Seminar = 5 marks

Clean & Green and Attendance =2 marks

**Total = 25 marks**

**P.R. Government College (A), Kakinada**

**Blue Print for Internal Theory Examination**

**For Three Major system**

| S. No. | Type of question | Unit | No. of Questions | No. of Questions Given | | | No. of Questions to be answered | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Total Quetions | Marks allotted To each question | Total marks | No. of Questions | Marks allotted To each question | Total marks |
| 1 | **Section – A** Essay question | I | 1 | 2 | 10 | 20 | 1 | 10 | 10 |
| | | II | 1 | | | | | | |
| 2 | **Section – B** Short answer Questions | III,IV & V One from Any of above units | 4 | 4 | 5 | 20 | 2 | 5 | 10 |
| 3 | **Section – C** Objective type questions | One question from each unit | 5 | 5 | 1 | 5 | 5 | 5 | 5 |
| **TOTAL** | | | | | | **45** | | | **25** |

Percentage of Choice given = $\frac{\mathbf{45-25}}{\mathbf{45}}$ X 100 = 44.44 %

The total of two internals is reduced to 25 marks and the other 25 marks allocated forCCE are further divided as follows

Study project = 10 marks
(Theoretical for odd Sem / Practical for even Sem)
Viva on subject =3 marks
Assignment = 5marks
Seminar = 5 marks
Clean & Green and Attendance =2 marks
**Total** **= 25 marks**

Blue print for Semester End Practical examinationFor
I, II & III Year

Practical Paper

**Scheme of Valuation for Practical**

Time: 2 hrs. Max. Marks: 50

1. Formulae & Explanation - 10 Marks
2. Tabular form + graph + circuit diagram - 10 Marks
3. Observations - 10 Marks
4. Calculation, graph, precaution and results - 10 Marks
5. Viva voice - 05 Marks
6. Record - 05 Marks

Note: Minimum of 6 experiments to be done and recorded.

For Microprocessor /Micro Controller practical

Scheme of Valuation for practical

Time:2 hrs. Max.Marks:50

1. Flow chart - 08 M
2. Algorithm - 07 M
3. Program - 15 M
4. Execution and Result - 10 M
5. Viva voice - 05 M
6. Record - 05 M

## P.R.GOVT. COLLEGE (A), KAKINADA

**Department of Physics and ElectronicsB.Sc. - Programme Outcomes**

On successful completion of B.Sc. program students will be able to:

**PO 1 Domain Expertise:**

- Acquire comprehensive domain knowledge and skills.
- Make use of the knowledge in an innovative manner.

**PO 2 Life-long Learning and Research:**

- Learn “how to learn”- Self-motivated and self-learning.
- Adopt to the ever emerging demands of work place and life.
- Investigate the problem and report in a proper manner.

**PO 3 Modern Equipment Usage**

- Adopt ICT mode of learning effectively.
- Access, retrieve and use authenticated information.
- Have knowledge of software applications to analyze data
- Usage of technology without deviating from the dedication of learning.

**PO 4 Computing Skills and Ethics**

- Develop rational and scientific thinking .
- Ensure the human values & ethics and to follow them throughout the life.

**PO 5 Complex problem Investigation & Solving**

- Predict and analyze problems.
- Frame hypotheses.

- Investigate and interpret empirical data.
- Plan and execute action.

**PO 6 Perform effectively as Individuals and in Teams**

- Work efficiently as an individual
- Cooperate, coordinate and perform effectively in diverse teams/groups.

**PO 7 Efficient Communication & Life Skills**

- To face challenges and self-sustainability in overcoming the psychological problems.
- Listen, understand and express views in a convincing manner.
- Develop skills to present information clearly and concisely to interested groups.

**PO 8 Environmental Sustainability**

- Following the green energy measures.
- Understand sensibly the environmental challenges.
- Think critically on preventing of environmental pollution.
- Propagate and follow environment friendly practices.

**PO 9 Societal contribution**

- Involve voluntarily in social development activities at Regional, National levels.
- Voluntary participation in serving the society from natural calamities viz. disasters,cyclones, epidemics.
- Be a patriotic citizen to uphold the constitutional values of the Nation.

**PO 10 Effective Project Management**

- Adoption of changes time to time in accordance with the situations.
- Identify the goals, objectives and components of a project for its completion.
- Plan, organize and direct the endeavors of teams to achieve the targets in time.

- Be competent in identifying opportunities and develop strategies and decisionmaking for contingencies.

**PSO of the Courses offered during 2022-23**

COURSE: B.Sc. - Mathematics, Physics, Electronics (M.P.E)

- **PSO 1:** Domain knowledge and understand the mechanism behind various electronic and physical systems and qualitative way through experiential learning with firm mathematical tools.
- **PSO 2:** Analyze the physical properties materials, electronic components to develop essential tools for better livelihood.
- **PSO 3:** Skills to study the optical, thermal, electrical and electronic properties of materials and also to explore the properties of various electronic components, communication systems, microprocessor and micro-controller.
- **PSO 4:** Ability to interlink the skills developed to select proper materials for suitable electronic applications, and acquires an aptitude to address the problems in simulation of electronic circuits, developing web and mobile applications.

COURSE: B.Sc. - Mathematics, Electronics, Computer Science (M.E.CS)

- **PSO 1:** Domain knowledge and understand the concepts of basic electronic components, microprocessors and micro controllers, algorithms, C language, Arduino programming, Networking, cloud and Big Data.
- **PSO 2:** Analyze the concepts of mathematics, Electronics and computer Networks and able to use them in solving real world problems
- **PSO 3:** Acquire the skills to use various electronic components, implementation of numerical algorithms by using various experiential techniques.
- **PSO 4:** Ability to interlink and adopt the skills developed and acquires an aptitude to address the problems in simulation of electronic circuits, developing web and mobile apps.

COURSE: B.Sc. - Mathematics, Electronics, Internet of Things (M.E.Iot)

- **PSO 1:** Domain knowledge and understand the concepts of basic electronic components, networks, communication systems, microprocessors and micro controllers, algorithms, C language, Arduino programming, Networking, cloud and Big Data.

- **PSO 2:** Analyse the concepts of mathematics, Electronics and computer Networks and able to use them in solving real world problems.
- **PSO 3:** Acquire the skills to use various electronic components, microprocessor, microcontroller, Arduino, Raspberry PI and simulators.

**PSO 4:** Ability to interlink the skills developed to design tools for internet of things, and gets an aptitude to address the problems in smart home design, smart vehicles, and smart sensors in various fields

**P . R . GOVT. COLLEGE (A), KAKINADA**

**DEPARTMENT OF PHYSICS & ELECTRONICSBOS**

**OF ELECTRONICS**

**ADDITIONS & DELETIONS IN THE CURRICULAM**

Program : II B.Sc.

Semester III

Course : III Electronics

Title of the course : Analog circuits & Communication.

| S. No. | Name of the Module | Topics Added | Justification |
|---|---|---|---|
| 1 | Module II | Monostable multivibrator.<br>Astable multivibrator. | ➢ It is appropriate to include this topic in view of further studies and competitive exams. |
| 2 | Module III | Equation of AM.<br>Bandwidth of AM. | ➢ It is appropriate to include this topic in view of further studies and competitive exams.<br>➢ For better understanding of the subject. |

Total Percentage of addition: 20 %

Program : II B.Sc.

Semester IV

Course : IV Electronics

Title of the course : MICROPROCESSOR SYSTEMS.

| S. No. | Name of the Module | Topics Added | Justification |
|---|---|---|---|
| 1 | Module I | Flag register, Interrupts: Maskable, non-maskable, Vectored & Non-vectord | ➢ It is appropriate to include this topic in view of further studies and competitive exams. |
| 2 | Module IV | Register organization, Flag register. | ➢ It is appropriate to include this topic in view of further studies and competitive exams.<br>➢ Clear understanding about 8086 Microprocessor |

Total Percentage of addition: 20 %

Program : II B.Sc.

Semester IV
Course : V Electronics
Title of the course : Microcontroller and Interface

| S. No. | Name of the Module | Topics Added | Justification |
|---|---|---|---|
| 1 | Module I | Harvard & Von-Neumann Architecture, Differences between RISC & CISC Microcontrollers | ➢ Give idea about various architectures.<br>➢ Give idea about Technology i.e., used in various Microcontrollers. |
| 2 | Module II | Features of 8051 | ➢ Give overview of 8051 |
| 3 | Module V | Basics of Serial Communication | ➢ Give idea about Different types of communication |

Total Percentage of addition: 20 %

**Note:** None of the topics are deleted.

| | | | | | | |
|---|---|---|---|---|---|---|
| | **P. R. College (Autonomous), Kakinada** | | **Program & Semester**<br>I B.Sc. Electronics<br>(II Semester)<br>W.e.f. 2023-24<br>Admitted batch | | | |
| Course Code | **TITLE OF THE COURSE**<br>**FUNDAMENTALS OF ELECTRICITY AND ELECTRONICS** | | | | | |
| Teaching | Hours Allocated: 45 (**Theory**) | L | T | P | C | |
| Pre-requisites | Ohm's Law, A.C & D.C currents, Semiconductor Physics | 3 | - | - | 3 | |

**Course Objectives:**

The students will learn:

1) basics of electrostatics, Gauss theorem and its applications,

concept of a capacitor, various types of capacitors and dielectric constant,

magnetic effects of current, cells and the measuring instruments like ammeter and voltmeter,

2) basics of p-n junction, rectifying action of a diode, regulated power supplies and wave shaping circuits, and

3) transistor and its three modes of operation, h-parameter model of a transistor and the frequency response of an amplifier.

## Syllabus

**MODULE- 1: (9Hrs)**

Electrostatics: Electric charges - Coulomb's law - Electric field - Electric intensity and electric potential - Relation between electric potential and intensity - Electric intensity and potential due to a uniform charged conducting sphere at a point outside, on, and inside the conductor.

Electric dipole - Dipole moment - Intensity and potential due to a dipole - Statement and proof of Gauss law - Application of Gauss law to uniformly charged solid sphere.

**MODULE-II: (9hrs)**

Capacitors: Definition and unit of capacity - Capacitance of a parallel plate capacitor - Effect of dielectric on capacity - Capacitors in series and parallel - Energy stored in a charged capacitors - Loss of energy on sharing of charges between two capacitors - Force of attraction between plates of charged parallel plate capacitor – Kelvin's attracted disc electrometer - Measurement of potential and dielectric constant. Type of capacitors - Mica capacitor, Electrolytic capacitors, Variable air capacitor – Uses of capacitors.

MODULE-III: (9hrs)

Electrical Measurements: Carey-Foster bridge - Determination of specific resistance - Potentiometer - Calibration of low and high range voltmeters - Calibration of Low range ammeter.

Magnetic Effect of Current: Biot-Savart's law [ Force on a conductor carrying current placed in a magnetic field] - Principle, construction and theory of a moving coil ballistic galvanometer - Measurement of figure of merit of B.G. - Comparison of capacitors using B.G.

**MODULE-IV: (9hrs)**

Diode circuits and power Supplies: Junction diode characteristics - Half and full wave rectifiers - Expression for efficiency and ripple factor - Construction of low range power peak using diodes - Bridge rectifier - Filter circuits - Zener Diode - Characteristics - Regulated power supply using Zener diode - Clipper and Clamper using diodes. Differentiator and integrator using resistor capacitor.

MODULE-V: (9hrs)

Transistor circuits: Characteristics of a transistor in CB, CE modes - Relatively merits

Graphical analysis in CE configuration - Transistor as a amplifier - RC coupled

Single stage amplifier - Frequency response - Thevenin's and Norton's theorems - h parameters.

asis logic gates AND, OR, and NOT - Construction of basic logic gates using diodes and transistors.

TEXT BOOKS:

1. **Electricity and Magnetism - M. Narayanamoorthi and Others, National Publishing Co., Chennai.**
2. **Electricity and Magnetism - R. Murugeshan, S. Chand & Co. Ltd., New Delhi, Revised Edition, 2006.**
3. **Principles of Electronics - V.K. Mehta, S. Chand & Co., 4/e, 2001.**
4. **Basic Electronics - B.L. Theraja, S. Chand & Co., 4/e, 2001.**

REFERENCE BOOKS:

1. Electricity and Magnetism - Brijlal & Subrahmanyam, Ratan Prakashan Mandir, Agra.
2. Fundamentals of Electricity and Magnetism - B.D. Duggal & C.L. Chhabra, Shoban Lal Nagin Chand & Co., Jallundur.
3. Physics, Vol. II - Resnick, Halliday & Krane, 5/e, John Wiley & Sons, Inc.,.
4. Basic Electronics - B. Grob, McGraw - hill, 6/e, NY, 1989.

Elements of Electronics - Bagde & Singh, S. Chand

Activities Proposed:

Measurable:

1. Assignments on Branch analysis & Nodal analysis, Network theorems, Frequency response for RLC circuits, NPN transistor characteristic curves, FET characteristics, UJT characteristics, Applications of UJT, Rectifiers, Filters, LEDs & Photo diodes
2. Student seminars (Individual presentation of papers) on topics relating to Branch analysis & Nodal analysis, Network theorems, Frequency response for RLC circuits, NPN transistor characteristic curves, FET characteristics, UJT characteristics, Applications of UJT, Rectifiers, Filters, LEDs & Photo diodes

3. Quiz Programmes on Alternating wave forms, RC, RL & RLC circuits, BJT, FET, UJT & Power supplies.
4. Individual Field Studies/projects on designing a circuit by using network theorems, Q-factor of an ac circuit, Transistor as an amplifier, IC voltage regulator using 78XX & any related project by using LED.
5. Group discussion on AC & DC, Applications of transistors, Applications of FET, rectifiers and its uses, Filters and its types, Voltages regulators and its types
6. Group/Team Projects on Design of IC voltage regulator by using solar power

General:

1. Collection of news reports and maintaining a record of paper-cuttings relating to topics covered in syllabus
2. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers
3. Any similar activities with imaginative thinking.

**P.R.GOVERNMENT COLLEGE (A), KAKINADA**

Electronics-Semester –II

Paper – 3 [Code: ]

**w.e.f. 2023 - 24 ADMITTED BATCH**

## FUNDAMENTALS OF ELECTRICITY AND ELECTRONICS

3 Hours/Week [Total: 45 hrs.] Credits: 03

**MODEL QUESTION PAPER**

Note: - Set the question paper as per the blue print given.

**Time: 2 Hrs.** **Max.Marks:50**

| Section | Questions to be given | Questions to be answered | Marks |
|---|---|---|---|
| A | 6 | 3 | 3 x 10M = 30M |
| B | 7 | 4 | 4 x 5 M = 20M |
| Total | 13 | 7 | 50M |

Blue Print

| Module Name | Essay Questions [10 marks] | Short Questions [5 marks] | Problems [5 marks] | Marks allotted |
|---|---|---|---|---|
| Electrostatics | 1 | 1 | - | 15 |
| Capacitors | 1 | 1 | 1 | 20 |
| Electrical Measurements | 1 | 1 | | 15 |
| Diode circuits and power Supplies | 2 | 1 | - | 25 |
| Transistor circuits | 1 | 1 | 1 | 20 |
| **Total Marks** | | | | 95 |

Note: At least two problems should be answered.

P.R.GOVERNMENT COLLEGE (A), KAKINADA

**Electronics - Semester – II**

**Paper – 1 [Code: ]**

w.e.f. 2023 - 24 ADMITTED BATCH

# FUNDAMENTALS OF ELECTRICITY AND ELECTRONICS

**3 Hours/Week [Total: 45 hrs.]** **Credits: 03**

MODEL QUESTION PAPER

**Time: 2 hrs.** **Max Marks: 50M**

Section - A

**Answer any Three questions by choosing at least one question from each part**

3 X 10 = 30 M

Part - A

1. Essay question from Module – 1
2. Essay question from Module – 2
3. Essay question from Module – 3

**Part - B**

4. Essay question from Module – 4
5. Essay question from Module – 4
6. Essay question from Module – 5

Section - B

**Answer any Four questions** **4 X 5 = 20 M**

7. Short answer question from Module - 1
8. Short answer question from Module - 2
9. Short answer question from Module - 3
10. Short answer question from Module - 4
11. Short answer question from Module - 5
12. Problem from Module – 2
13. Problem from Module – 3

| | | | | | |
|---|---|---|---|---|---|
| | **P. R. College (Autonomous), Kakinada** | **Program & Semester** II B.Sc. Electronics (III Semester) | | | |
| Course Code **EL3205** | **TITLE OF THE COURSE Analog Circuits & Communication** | | | | |
| Teaching | Hours Allocated: 60 (**Theory**) | L | T | P | C |
| Pre-requisites | Voltage & Current divider rule, | 4 | - | - | 4 |

**Course Objectives:**

1. To understand the concepts, working principles and key applications of linear integrated circuits.
2. To perform analysis of circuits based on linear integrated circuits.
3. To design circuits and systems for particular applications using linear integrated circuits.
4. To introduce students to various modulation and demodulation techniques of analog communication.
5. To analyze different parameters of analog communication techniques
6. It also focuses on Transmitters and Receivers.

**Course Outcomes:**

| On Completion of the course, the students will be able to | |
|---|---|
| CO1 | Students would learn about basic op-Amp circuits, inverting, non-inverting amplifiers, frequency response of op-Amp. They would also learn about the interpretation of op-Amp data sheets. |
| CO2 | Students would learn about the applications of op-Amps for various mathematical operations, usage of op-Amp as oscillators, and voltage regulators. |
| CO3 | Students would learn about basics of communication systems, AM, FM and PM. They would also learn about the basics of Amplitude Modulation, modulator & demodulator circuits. |
| CO4 | Students would learn about the concepts of Frequency Modulation, generation and detection of FM waves, advantages of FM over AM and block diagrams of AM and FM radio receivers. |

**Course with focus on employability / entrepreneurship / Skill Development modules**

| | | | | | |
|---|---|---|---|---|---|
| **Skill Development** | | **Employability** | | **Entrepreneurship** | |

## SYLLABUS

**MODULE – I (12hrs)**

**OPERATIONAL AMPLIFIERS:**

Definition of Op-amp, Characteristics of Op-Amp, op-amp parameters, Block diagram of op-amp, inverting, virtual ground, non-inverting, summing amplifier, subtractor (differential amplifier), voltage follower, integrator, differentiator, Logarithmic amplifier.

**MODULE - II(12hrs)OP-AMP CIRCUITS:**

Voltage regulator, comparator, Schmitt trigger (square wave generator), sine wave generator (Wien's bridge), Active filters (Basics)-low pass, high pass filters IC-555 –functional block diagram, *Monostable and Astable Multivibrator* and mention it's applications

**MODULE – III (12Hrs)**

**AMPLITUDE MODULATION:**

**Need for modulation, *Equation of AM Wave*, amplitude modulation-frequency spectrum** of AM wave, *bandwidth of AM Wave*, power relations in the AM wave. Generation of AM-simple diode modulator. Detection of AM signals – Diode detector.

**MODULE - IV (12hrs)**

**FREQUENCY MODULATION:**

Theory of FM, Frequency deviation and carrier swing, modulation index, deviation ratio, percent modulation. Mathematical representation of FM, frequency spectrum and bandwidth of FM waves, Generation of FM signals – Varactor diode modulator.Detection of FM waves – Ratio detector.

**MODULE - V (12hrs)**

RADIO BROADCASTING AND RECEPTION:

**Spectrum of electromagnetic waves, Radio broadcasting and reception, types of wave propagation, Transmitter (block diagram), AM receiver- block diagram, Super heterodyne receiver. FM receiver- Block diagram**

Note: Topics in Bold & Italic are added to the syllabus

Text books:


1. **Op Amp and Linear Integrated Circuits by Ramakant Gaikwad**
2. Linear Integrated Circuits By Roy Choudhary
3. **Unified Electronics Vol II – J.P. Agarwal and Amit Agarwal.**
4. Electronic Communications - George Kennedy

5. **Antennas and Wave Propagation – G.S.N.Raju – PHI**
6. Principles of communication system –Herbert Taub & D.L.Schilling

**Reference books:**

1. Jacob Millan, Micro Electronics, McGraw Hill.
2. **Mithal G K, Electronic Devices and Circuits Thana Publishers.**
3. Allan Mottershead ,Electronic Devices and Circuits – An Introduction- PrenticeHall
4. **Electronic Communications – Roody & Colen**
5. Communication Systems – Hayken --- 4 th Edition
6. **Modern digital and analog communication system –B.P. Lathi**

Web Links:

1.
2.

Activities proposed:

Measurable:

1. Assignments on inverting amplifier, non-inverting amplifier, voltage follower integrator, differentiator, voltage regulator, square wave generator, Wien bridge oscillator, Active filters, IC-555 timer, Equation of AM wave, Amplitude modulator, Demodulation, Generation of FM, FM demodulator, Radio broadcasting & reception, super heterodyne receiver.
2. Student seminars (Individual presentation of papers) on topics relating to inverting amplifier, non-inverting amplifier, integrator, differentiator, logarithmic amplifier, square wave generator, sinewave generator, active filters, IC-555 timer applications, Different modulation & demodulation techniques of AM & FM, Electromagnetic spectrum and its applications, AM & FM transmitters, different types of receivers employed in AM & FM.
3. Quiz Programmes on op-amp characteristics & parameters, applications of op-amp, modulation & demodulation techniques in AM & FM, electromagnetic spectrum, AM & FM transmitters, AM & FM receivers.
4. Individual Field Studies/projects on designing voltage regulators(Series & Shunt) using op-amp, output voltage regulation using IC-555 timer, design of PWM circuit using IC-555 timer.
5. Group discussion on applications of op-amp, applications of IC-555 timer, radio broadcasting and reception.
6. Group/Team Projects on designing a simple radio transmitter & receiver.

General:

7. Collection of news reports and maintaining a record of paper-cuttings relating to topics covered in syllabus
8. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers

9. Any similar activities with imaginative thinking.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 3 | 3 | 3 | 1 | - | - | 1 | 3 | 3 | 1 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| CO3 | 2 | 2 | 2 | 2 | 3 | 2 | 1 | - | 1 | 3 | 3 | 2 | 2 | 2 |
| CO4 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | - | - | 1 | 3 | 3 | 2 | 3 |
| **Avg.** | | | | | | | | | | | | | | |

**P.R.GOVERNMENT COLLEGE (A), KAKINADA**

B.Sc. II Year - Electronics – Semester – 3PAPER – 3 [Code: EL3205]

**w.e.f. 2022 - 23 ADMITTED BATCH**

## ANALOG CIRCUITS AND COMMUNICATION

4 Hours/Week [Total: 60 hrs.] Credits: 04

## MODEL QUESTION PAPER

Note: - Set the question paper as per the blue print given.

**Time: 2 Hrs.** **Max.Marks:50**

| Section | Questions to be given | Questions to be answered | Marks |
|---|---|---|---|
| A | 6 | 3 | 3 x 10M = 30M |
| B | 7 | 4 | 4 x 5 M = 20M |
| Total | 13 | 7 | 50M |

Blue Print

| Module Name | Essay Questions [10 marks] | Short Questions [5 marks] | Problems [5 marks] | Marks allotted |
|---|---|---|---|---|
| **Operational Amplifiers** | 1 | 1 | 1 | 20 |
| **Op-Amp Circuits** | 2 | 0 | 1 | 25 |
| **Amplitude Modulation** | 1 | 1 | 1 | 20 |
| **Frequency Modulation** | 1 | 1 | - | 15 |
| **Radio Broadcasting and Reception** | 1 | 1 | - | 15 |
| **Total Marks** | | | | 95 |

Note: At least two problems should be answered.

P.R.GOVERNMENT COLLEGE (A), KAKINADA

**B.Sc. II Year - Electronics – Semester – 3**

**PAPER – 3 [Code: EL3205]**

w.e.f. 2022 - 23 ADMITTED BATCH

ANALOG CIRCUITS AND COMMUNINATION

**4 Hours/Week [Total: 60 hrs.]** **Credits: 04**

MODEL QUESTION PAPER

**Time: 2 hrs.** **Max Marks: 50M**

Section - A

**Answer any Three questions by choosing at least one question from each part**

3 X 10 = 30 M

Part - A

1. Essay question from Module – 1
2. Essay question from Module – 2
3. Essay question from Module – 2

**Part - B**

4. Essay question from Module – 3
5. Essay question from Module – 4
6. Essay question from Module – 5

Section - B

**Answer any Four questions** **4 X 5 = 20 M**

7. Short answer question from Module - 1
8. Short answer question from Module - 3
9. Short answer question from Module - 4
10. Short answer question from Module - 5
11. Problem from Module - 1
12. Problem from Module – 2
13. Problem from Module – 3

| | P. R. College (Autonomous), Kakinada | Program & Semester: II B.Sc. Electronics (III Semester) | | | |
|---|---|---|---|---|---|
| Course Code **EL3205P** | **TITLE OF THE COURSE** **Analog circuits & Communication** | | | | |
| Demonstration | Hours Allocated: 30 (Practical) | L | T | P | C |
| Pre-requisites | Boolean laws | - | - | 2 | 1 |

**Course Objectives:**

1. To explain the operation of operational amplifier.
2. To learn about ideal characteristics & parameters of op-amp.
3. To calculate the output voltage, gain for inverting and non-inverting amplifiers.
4. To construct different analog circuits like voltage adder, voltage follower, integrator, differentiator and observe its output.
5. To study modulation and demodulation process of AM & FM

**Course Outcomes:**

| On Completion of the course, the students will be able to | |
|---|---|
| CO1 | Learnt about output voltage gain for inverting & non-inverting amplifiers. |
| CO2 | Learnt about the application of op-amp as adder circuit & voltage follower. |
| CO3 | Learnt about the application of IC 555 timer as astable multivibrator. |
| CO4 | Learnt about the modulation and demodulation of AM wave. |

**Course with focus on employability / entrepreneurship / Skill Development modules**

Any **Five** experiments should be done.

1. Op-Amp as non-inverting amplifier.
2. Op-Amp as inverting amplifier.
3. Op-Amp as voltage follower.
4. Op-Amp as integrator and differentiator
5. Op-Amp as adder.
6. Astable multivibrator using IC 555.
7. Op-Amp as voltage to current converter.
8. Op-Amp as square wave generator.
9. Amplitude modulation and demodulation.
10. AM as Transmitter

CO-PO Mapping:

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 1 | - | 1 | 3 | 3 | 1 | 3 |
| CO2 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 1 | 1 | 3 | 2 | 2 | 2 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 3 | 2 | 3 | 2 | 2 |
| CO4 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | - | 1 | 1 | 3 | 3 | 3 | 3 |
| **Avg.** | | | | | | | | | | | | | | |

**1. Slight[Low]; 2:Moderate 3. Medium :4. Substantial [High], '-':No Correlation)**

| | P.R. Government College (Autonomous), Kakinada | Program & Semester II B.Sc. (III Sem) (A.Y. 2022 – 2023) | | | |
|---|---|---|---|---|---|
| Course Code | **SOLDERING & DE-SOLDERING OF COMPONENTS (Skill Development Course)** | | | | |
| Teaching | Hours Allocated: 30 (**Theory**) | L | T | P | C |
| Pre-requisites: | Basic idea about Latitudes and Longitudes, Introduction to semiconductors, PN junction diode and its characteristics | 2 | 0 | - | 2 |

Module – 1(6 hrs.)

**Soldering Tools** - Different types of Soldering Guns related to Temperature and wattages, types of tips, Solder materials and their grading, types of soldering De soldering using Pump and wick.

Module – 2(6 hrs.)

**Soldering and De Soldering Stations -** Soldering and De Soldering Stations and their Specifications, Safety precautions while Soldering & De soldering, Preparing Component for Soldering and De soldering.

Module – 3 (6 hrs.)

**Printed Circuit Boards**- Types of PCB, Soldering Basic Components on PCB.

Module – 4 (6 hrs.)

**Surface Mount Device components** - Introduction of SMD Components, Soldering the SMD components on the PCB.

Module – 5 (6 hrs.)

**Identification of Faults** - Identification of loose/dry solder, broken tracks on printed wire assemblies & discrete components mounted circuit boards , Join the broken PCB track and test.

Text books & Reference books


1. Principles of Reliable Soldering Techniques, Author R. Sengupta, Published by New Age International
2. Surface Mount Technology: Principles and Practice by Ray Prasad, Published by Springer Science, 4.
3. Complete PCB Design Using OrCad Capture and Layout, Author Kraig Mitzner, Published by Newnes.

## Web Links:

http://spokentutorial.org/watch/KiCad/Designing+printed+circuit+board+in+KiCad/Hindi/2.

**P.R. Government College (A), Kakinada.**

**Department of Physics & Electronics**

**II B.Sc. – Semester – III (A.Y. 2022 – 2023)**

SOLDERING & DE-SOLDERING OF COMPONENTS

**(Skill Development Course)**

Course Code : No. of credits : 02

Hour/Week :2 Total Hours : 30

**Note:-** Set the question paper as per the blue print given below.

**Time: 1 Hrs.** **Max. Marks: 50**

Blue Print

| Module | | No. of Qs. | Marks allotted |
|---|---|---|---|
| 1 | **Soldering Tools** | 10 | 10 |
| 2 | **Soldering and De Soldering Stations** | 20 | 20 |
| 3 | **Printed Circuit Boards** | 10 | 10 |
| 4 | **Surface Mount Device components** | 5 | 5 |
| 5 | **Identification of Faults** | 5 | 5 |
| | TOTAL | 50 | 50 |

- Question paper will be set in the Multiple Choice Based

| | | | | | |
|---|---|---|---|---|---|
| | **P. R. College (Autonomous), Kakinada** | **Program & Semester**<br>II B.Sc. Electronics (IV Semester) Paper - IV | | | |
| Course Code **EL4205** | **TITLE OF THE COURSE Microprocessor Systems** | | | | |
| Teaching | Hours Allocated: 60 (**Theory**) | L | T | P | C |
| Pre-requisites | Multiplexing, Demultiplexing, Memory organization | 4 | - | - | 4 |

**Course Objectives:**

1. To understand basic architecture of 16 bit and 32 bit microprocessors.
2. To understand interfacing of 16 bit microprocessor with memory and peripheral chips involving system design.
3. To understand techniques for faster execution of instructions and improve speed of operation and performance of microprocessors.
4. To understand RISC based microprocessors.
5. To understand concept of multi core processors.

**Course Outcomes:**

| On Completion of the course, the students will be able to | |
|---|---|
| CO1 | The student can gain good knowledge on microprocessor and implement in practical applications |
| CO2 | Design system using memory chips and peripheral chips for 16 bit 8086 microprocessor. |
| CO3 | Understand and devise techniques for faster execution of instructions, improve speed of operations and enhance performance of microprocessors. |
| CO4 | Understand multi core processor and its advantages |

**Course with focus on employability / entrepreneurship / Skill Development modules**

| | | | | | |
|---|---|---|---|---|---|
| **Skill Development** | | **Employability** | | **Entrepreneurship** | |

## SYLLABUS

**MODULE -I: (12 Hrs.)**
**CPU ARCHITECTURE:**

Introduction to Microprocessor, INTEL -8085 – Architecture of 8085, CPU, ALU unit, Register organization, Address, data and control Buses. Pin configuration of 8085. ***Flag register***, ***Interrupts – maskable, non-maskable, hardware & software interrupts.*** Addressing modes of 8085. Instruction format.

**MODULE -II: (12 Hrs.)**

8085 Instruction Set:

Instruction set - Data transfer Instruction, Logical Instructions, Arithmetic Instructions, Branch Instructions, Machine Control instructions.

MODULE -III: (12 Hrs.)

**Assembly Language Programming using 8085:**

Programs for Addition, Subtraction, Multiplication, Division, largest and smallest number in an array.

MODULE -IV: (12 Hrs.)8086:

Architecture of 8086, ***Register organization, Flag register***, Addressing modes of 8086, instruction format. Basic 8086 Configurations – Minimum mode and Maximum Mode, Interrupts. I/O Interfaces: Serial Communication interfaces (8251), Keyboard and display(8279) (block diagram), DMA controller (8257)(block diagram).

MODULE -V: (12 Hrs.)

**Arm Processor:**

Introduction to 16/32 bit processors, Arm architecture & organization, Arm based MCUs, Instruction set.

Note: Topics in Bold & Italic are added to the syllabus.

Text books:

1. **Microprocessor Architecture, Programming and Applications with the 8085 –** Penram International Publishing, Mumbai.- Ramesh S. Gaonakar
2. **Microcomputer Systems the 8086/8088 family – YU-Cheng Liu and Glenn SA Gibson**
3. Microcontrollers Architecture Programming, Interfacing and System Design– RajKamal Chapter: 15.1, 15.2, 15.3, 15.4.1
4. **8086 and 8088 Microprocessor by Tribel and Avatar Singh.**

REFERENCES:

1. **Microprocessors and Interfacing – Douglas V. Hall**
2. Microprocessor and Digital Systems – Douglas V. Hall
3. **Advanced Microprocessors & Microcontrollers - B.P. Singh & Renu Singh – New Age**
4. The Intel Microprocessors – Architecture, Programming and Interfacing – Bary B.Brey.
5. **Arm Architecture reference manual –Arm ltd**

Web Links:

1.
2.

Activities proposed

Measurable:

1. Assignments on types of buses, 8085 Architecture, pin diagram, register organisation, types of interrupts, instruction set, 8086 architecture, pin diagram, register organisation, maximum mode configuration, minimum mode configuration. Interfacing of USART, interfacing of Keyboard & display and DMA controller. Comparison of ARM processor with other processors.
2. Student seminars (Individual presentation of papers) on topics relating to different types of architectures (8085, 8086, ARM processor, 8251, 8279, 8257), interrupts and their significance, pin diagram of various ICs, register organisations of various ICs
3. Quiz Programmes on architecture, instruction set, instruction format, applications of various processors, modes of processors.
4. Individual Field Studies/projects on interfacing of steeper motor to 8085, 8086.
5. Group discussion on programs.
6. Group/Team Projects on interfacing a peripheral device to 8086 using PC.

General:

7. Collection of news reports and maintaining a record of paper-cuttings relating to topics covered in syllabus
8. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers
9. Any similar activities with imaginative thinking.

**CO-PO Mapping:**

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | - | 1 | 1 | 3 | 3 | 1 | 3 |
| CO2 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 1 | - | 2 | 2 | 3 | 2 | 2 |
| CO3 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | - | 1 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 1 | - | 1 | 3 | 2 | 2 | 3 |
| **Avg.** | | | | | | | | | | | | | | |

**Topics Included / Deleted under Autonomous setup**

Program : II B.Sc.
Semester IV
Course : IV Electronics
Title of the course : Microprocessor systems.

| S. No. | Name of the Module | Topics Added | Justification |
|---|---|---|---|
| 1 | Module I | Flag register<br>Interrupts: maskable, non-maskable, vectored & non-vectored | ➢ In continuation with the previous topic.<br>➢ It is appropriate to include this topic in view of further studies and competitive exams. |
| 2 | Module IV | Register organization.<br>Flag register | ➢ Clear understanding about 8086 microprocessors.<br>➢ It is appropriate to include this topic in view of further studies and competitive exams. |

Total Percentage of addition: 20 %

**P.R.GOVERNMENT COLLEGE (A), KAKINADA**

Electronics-Semester - IVPaper – 4

[Code: EL4205]

**w.e.f. 2022 - 23 ADMITTED BATCH**

**Microprocessor Systems**

4 Hours/Week [Total: 50 hrs.] Credits: 04

## MODEL QUESTION PAPER

Note: - Set the question paper as per the blue print given.

**Time: 2 Hrs.** **Max.Marks:50**

| Section | Questions to be given | Questions to be answered | Marks |
|---|---|---|---|
| A | 6 | 3 | 3 x 10M = 30M |
| B | 7 | 4 | 4 x 5 M = 20M |
| Total | 13 | 7 | 50M |

Blue Print

| Module Name | Essay Questions [10 marks] | Short Questions [5 marks] | Programs [5 marks] | Marks allotted |
|---|---|---|---|---|
| CPU Architecture | 1 | 2 | - | 20 |
| 8085 Instruction set | 2 | 1 | - | 25 |
| Assembly language programming using 8085 | 1 (Program) | - | 2 | 20 |
| 8086 | 1 | 1 | - | 15 |
| ARM Processor | 1 | 1 | - | 15 |
| **Total Marks** | | | | 95 |

**P.R.GOVERNMENT COLLEGE (A), KAKINADA**

Electronics-Semester - IVPaper – 4

[Code: EL4205]

**w.e.f. 2022 - 23 ADMITTED BATCH**

## Microprocessor Systems

MODEL QUESTION PAPER

**Time: 2 hrs.** **Max Marks: 50 M**

Section - A

**Answer any Three questions by choosing at least one question from each part**

3 X 10 = 30 M

Part – A

1. Essay question from Module – 1
2. Essay question from Module – 2
3. Essay question from Module – 2

**Part – B**

4. Essay question from Module – 3
5. Essay question from Module – 4
6. Essay question from Module – 5

Section - B

**Answer any Four questions** **4 X 5 = 20 M**

7. Short answer question from Module - 1
8. Short answer question from Module - 1
9. Short answer question from Module - 2
10. Short answer question from Module - 4
11. Short answer question from Module - 5
12. Program from Module – 3
13. Program from Module – 3

| | P. R. College (Autonomous), Kakinada | Program & Semester<br>II B.Sc. Electronics (IV Semester) Paper - IV | | | |
|---|---|---|---|---|---|
| Course Code<br>**EL4205P** | **TITLE OF THE COURSE**<br>**Microprocessor Systems** | | | | |
| Demonstration | Hours Allocated: 30 (Practical) | L | T | P | C |
| Pre-requisites | Opcodes of 8085 | - | - | 2 | 1 |

**Course Objectives:**

1. To understand techniques for faster execution of instructions and improve speed of operation and performance of microprocessors.
2. To understand the execution of programs by using simulator.

**Course Outcomes:**

| On Completion of the course, the students will be able to | |
|---|---|
| CO1 | Learnt about microprocessor instruction set and its usage |
| CO2 | Learnt about algorithm and flow chart preparation for better understanding of program writing. |
| CO3 | Learnt about techniques for faster execution of instructions to improve the speed of operation and performance. |
| CO4 | Learnt about interfacing of different peripherals and to observe its operation. |

**Course with focus on employability / entrepreneurship / Skill Development modules**

Any **Five** experiments should be done

1. Addition (8 – Bit)
2. Subtraction (8 – bit)
3. Addition (16-bit)
4. Subtraction (16-bit)
5. Multiplication (8 - bit)
6. Division (8 – bit)
7. Ascending order.
8. Descending order.
9. Largest number in the given array.
10. Smallest number in the given array.

## CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 3 | 3 | 2 | 1 | - | - | 1 | 3 | 3 | 2 | 3 |
| CO2 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | - | - | 2 | 2 | 2 | 2 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | - | - | 2 | 2 | 2 | 2 | 2 |
| CO4 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | - | - | 1 | 3 | 3 | 2 | 3 |
| **Avg.** | | | | | | | | | | | | | | |

| | P. R. College (Autonomous), Kakinada | Program & Semester | | | |
|---|---|---|---|---|---|
| Course Code **EL5205** | **TITLE OF THE COURSE** **Microcontroller and Interfacing** | II B.Sc. Electronics (IV Semester) Paper - V | | | |
| Teaching | Hours Allocated: 60 (**Theory**) | L | T | P | C |
| Pre-requisites | Microprocessor basics | 4 | - | - | 4 |

**Course Objectives:**

1. To understand the concepts of microcontroller based system.
2. To enable design and programming of microcontroller based system.
3. To know about the interfacing Circuits.

**Course Outcomes:**

| On Completion of the course, the students will be able to | |
|---|---|
| CO1 | Understand the architecture of 8051 microcontroller. |
| CO2 | Understand the key concepts of 8051 microcontroller systems like I/O operations, Interrupts, programming of timers and counters. |
| CO3 | Understand Interfacing of 8051 Microcontroller with peripherals. |
| CO4 | Write & execute 8051 microcontroller programs to perform various experiments |

**Course with focus on employability / entrepreneurship / Skill Development modules**

| Skill Development | | Employability | | Entrepreneurship | |
|---|---|---|---|---|---|

## SYLLABUS

**Module-I**: (10 Hrs.)

Introduction to microcontrollers:

Introduction to microcontrollers, comparison of Microprocessor and micro controller, *Harvard & Von Neumann architecture, differences between RISC & CISC microcontrollers,* 8-bit and 16- bit Microcontrollers, Development tools for micro controllers – Editor, Assembler, Compiler, Simulator, Debugger & Emulator.

**Module -II**: (15 Hrs.)

Microcontroller Architecture:

Overview and block diagram of 8051, ***Features of 8051***, Architecture of 8051, program counter and memory organization, Data types and directives, PSW register, Register banks and stack, pin diagram of 8051, Interrupts and timers.

**Module-III**:(12 Hrs.)

Addressing modes, instruction set of 8051:

Addressing modes and accessing memory using various addressing modes, instruction set: Arithmetic, Logical, Simple bit, jump, loop and call instructions and their usage. Timer/Counter Programming.

**Module -IV:** (10 Hrs.)

Assembly language programming:

Addition, Multiplication, Subtraction, division, arranging a given set of numbers in largest/smallest order (All 8-bit data).

**Module-V** : (13 Hrs.)

Interfacing and Application of Microcontroller:

***Basics of serial communication***, 8255 PPI, Interfacing of – PPI 8255 with 8051, interfacing seven segment displays, displaying information on an LCD, control of a stepper Motor (Uni-Polar).

Note: Topics in Bold & Italic are added to the syllabus.

Text books:

1. The 8051 microcontroller and embedded systems using assembly and c-kennet j. Ayalam, Dhananjay V. gadre, cengage publishers
2. The 8051 microcontrollers and Embedded systems - By Muhammad Ali Mazidi and Janice Gillespie Mazidi – Pearson Education Asia, 4th Reprint, 2002.

REFERENCES:

1. Microcontrollers Architecture Programming, Interfacing and System Design – **Raj Kamal.**
2. The 8051 Microcontroller Architecture, Programming and Application - **Kenneth J. Ajala ,** west publishing company (ST PAUL, NEW YORK, LOS ANGELES, SAN FRANCISCO).
3. Microcontroller theory and application-Ajay V. Deshmukh

Web Links:

1.
2.

Activities proposed

Measurable:

1. Assignments on Harvard & Von Neumann architecture, RISC & CISC microcontroller, development tools for microcontrollers, architecture of 8051, registers in 8051, data types and directives, pin diagram of 8051, interrupts in 8051, addressing modes of 8051, timers in 8051, assembly language programs, 8255 PPI, interfacing of 8051 with 8255.
2. Student seminars (Individual presentation of papers) on topics relating to different types of microcontrollers (4-bit, 8-bit, 16-bit & 32-bit), Development tools for microcontrollers (Editor, Assembler, Compiler, Simulator, Debugger & Emulator), Block diagram of 8051, Special function registers, accessing memory using various addressing modes, mode operations in 8051, interfacing of 8051 with peripheral device.
3. Quiz Programmes on architecture, instruction set, special function registers, timer modes in 8051, instruction set.
4. Individual Field Studies/projects on interfacing of steeper motor to 8051.
5. Group discussion on programs.
6. Group/Team Projects on interfacing a peripheral device to 8051.

General:

7. Collection of news reports and maintaining a record of paper-cuttings relating to topics covered in syllabus
8. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers
9. Any similar activities with imaginative thinking.

**CO-PO Mapping:**

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 3 | 3 | 3 | 1 | - | - | 1 | 3 | 3 | 1 | 3 |
| CO2 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 1 | - | 3 | 2 | 3 | 2 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 3 | 3 | 3 | 2 | 2 |
| CO4 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | - | 1 | 1 | 3 | 3 | 2 | 3 |
| **Avg.** | | | | | | | | | | | | | | |

**Topics Included / Deleted under Autonomous setup**

Program : II B.Sc.
Semester IV
Course : V Electronics
Title of the course : Microcontroller & Interfacing.

| S. No. | Name of the Module | Topics Added | Justification |
|---|---|---|---|
| 1 | Module I | Harvard & Von Neumann architecture.<br>Differences between RISC & CISC microcontrollers | ➢ Gives idea about various architectures.<br>➢ Gives idea about technology that is used in various microcontrollers. |
| 2 | Module II | Features of 8051 | ➢ Gives clarity about 8051. |
| 3 | Module V | Basics of serial communication. | ➢ Gives idea about different types of communication. |

Total Percentage of addition: 20 %

**P.R. GOVERNMENT COLLEGE (A), KAKINADA**

**B.Sc. II Year - Electronics – Semester – 4**

PAPER – 5 [Code: EL5205]

**w.e.f. 2022-23 ADMITTED BATCH**

**Micro Controller and Interfacing**

4 Hours/Week [Total: 60 hrs.] Credits: 04

## MODEL QUESTION PAPER

Note: - Set the question paper as per the blue print given.

**Time: 2 Hrs.** **Max.Marks:50**

| Section | Questions to be given | Questions to be answered | Marks |
|---|---|---|---|
| A | 6 | 3 | 3 x 10M = 30M |
| B | 7 | 4 | 4 x 5 M = 20M |
| Total | 13 | 7 | 50M |

Blue Print

| Module Name | Essay Questions [10 marks] | Short Questions [5 marks] | Programs [5 marks] | Marks allotted |
|---|---|---|---|---|
| Introduction to microcontrollers | 1 | 2 | - | 20 |
| Microcontroller architecture | 2 | 1 | - | 25 |
| Addressing modes, instruction set of 8051 | 1 | 1 | - | 15 |
| Assembly Language programming | 1 (Program) | - | 2 | 20 |
| Interfacing & application of microcontroller | 1 | 1 | - | 15 |
| **Total Marks** | | | | 95 |

**P.R. GOVERNMENT COLLEGE (A), KAKINADA**

**B.Sc. II Year - Electronics – Semester – 4**

PAPER – 5 [Code: EL5205]

**w.e.f. 2022-23 ADMITTED BATCH**

## Micro Controller and Interfacing

MODEL QUESTION PAPER

**Time: 2 hrs.** **Max Marks: 50M**

Section - A

**Answer any Three questions by choosing at least one question from each part**

3 X 10 = 30 M

Part – A

1. Essay question from Module – 1
2. Essay question from Module – 2
3. Essay question from Module – 2

**Part – B**

4. Essay question from Module – 3
5. Essay question from Module – 4
6. Essay question from Module – 5

Section – B

**Answer any Four questions** **4 X 5 = 20 M**

7. Short answer question from Module - 1
8. Short answer question from Module - 1
9. Short answer question from Module - 2
10. Short answer question from Module - 3
11. Short answer question from Module - 5
12. Program from Module – 4
13. Program from Module – 4

| | P. R. College (Autonomous), Kakinada | Program & Semester: II B.Sc. Electronics (IV Semester) Paper - V | | | |
|---|---|---|---|---|---|
| Course Code **EL5205P** | **TITLE OF THE COURSE** **Microcontroller and Interface** | | | | |
| Demonstration | Hours Allocated: 30 (Practical) | L | T | P | C |
| Pre-requisites | Hex codes for 8051 | - | - | 2 | 1 |

**Course Objectives:**

1. To understand techniques for faster execution of instructions and improve speed of operation and performance of microcontrollers.
2. To understand the execution of programs by using simulator.

**Course Outcomes:**

| On Completion of the course, the students will be able to | |
|---|---|
| CO1 | Learnt about microcontroller instruction set and its usage |
| CO2 | Learnt about algorithm and flow chart preparation for better understanding of program writing. |
| CO3 | Learnt about techniques for faster execution of instructions to improve the speed of operation and performance. |
| CO4 | Learnt about interfacing of different peripherals and to observe its operation. |

**Course with focus on employability / entrepreneurship / Skill Development modules**

Any **Five** experiments should be done

1. Addition (8 – Bit)
2. Subtraction (8 – bit)
3. Multiplication (8 - bit)
4. Division (8 – bit)
5. Ascending order (8 – bit)
6. Descending order (8 – bit)
7. Largest number in the given array (8 – bit)
8. Smallest number in the given array (8 – bit)

## CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 3 | 3 | 3 | 1 | - | - | 1 | 3 | 3 | 2 | 3 |
| CO2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | - | - | 3 | 2 | 3 | 2 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | - | - | 3 | 3 | 2 | 2 | 2 |
| CO4 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | - | - | 1 | 3 | 3 | 2 | 3 |
| **Avg.** | | | | | | | | | | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | **P. R. College (Autonomous), Kakinada** | **Program & Semester** III B.Sc. Electronics (V Semester) Paper – VI A | | | |
| Course Code **EL6205A** | **TITLE OF THE COURSE Industrial Electronics** | | | | |
| Teaching | Hours Allocated: 60 (**Theory**) | L | T | P | C |
| Pre-requisites | | 4 | - | - | 4 |

**Course Objectives:**

1. To understand the concepts of rectifiers, filters, power supplies & multipliers.
2. To identify various lab electrical instruments and their working.
3. To understand the properties and applications of different materials like resistor, inductor, capacitor.
4. To study the heating effects and dielectric properties of the materials.

**Course Outcomes:**

| On Completion of the course, the students will be able to | |
|---|---|
| CO1 | Identify various facilities required to set up a basic Instrumentation Laboratory. |
| CO2 | Acquire a critical knowledge of various Electrical Instruments used in the Laboratory. |
| CO3 | Demonstrate skills in using instruments like Rectifiers, Multimeters, Power supplies, Voltage Regulators etc. through hands-on experience. |
| CO4 | Understand the Principle and operation of different Electronic Heating devices. |

**Course with focus on employability / entrepreneurship / Skill Development modules**

| | | | | | |
|---|---|---|---|---|---|
| **Skill Development** | | **Employability** | | **Entrepreneurship** | |

## SYLLABUS

**Module - I (20 hours)**

**Rectifiers and filters:**

Rectifiers– Half wave, full-wave and bridge rectifiers- Efficiency- Ripple factor- Regulation – Harmonic components in rectified output – Types of filters- Choke input (inductor) filter- Shunt capacitor filter- L section and π section filters.

**Voltage Regulators**: Transistor Series voltage regulator - Transistor Shunt voltage regulator – Three terminal regulators (78XX and 79XX).

Module - II (10 hours)

Power Supplies:

Block diagram of regulated power supply – A simple regulated transistorized power supply (circuit and working) – Principle and working of switch mode power supply (SMPS).

MODULE-III (10 hours)

**Voltage Multipliers:**

Half wave voltage doubler, Full wave voltage doubler, Voltage Tripler circuit diagram and working mentioning of applications of voltage multipliers.

MODULE-IV (10 hours)

**Controlled rectifiers:**

SCR Half wave rectifier circuit, working with wave forms, mathematical analysis for resistive load - SCR Full wave rectifier circuit, working with wave forms, mathematical analysis for resistive load – SCR as inverter parallel and series circuits.

MODULE-V (10 hours)

**Heat effects:**

Resistance, inductance and dielectric heating. Principle of operations and its applications. Dielectric Properties: Introduction, effect of a dielectric on the behavior of a capacitor, dielectric losses, significance of the loss tangent.

Text books:


1. Unified Electronics Volume II by J.P Agarwal and Amit Agarwal.
2. Industrial Electronics, S.B. Biswas, Dhanapur Rai & Sons.
3. Industrial Electronics, G.K. Mithal, Khanna Publishers.
4. Electronic Devices and Circuits – G.K. Mithal.
5. Electronic Devices and Circuits-Millman and Halkias- Tata Mc Graw Hill (TMH)
6. Microelectronics- J. Millman and A. Grabel - TMH


Web Links:

1.
2.

Activities proposed

Measurable:

1. Assignments on Half wave rectifier, Full wave rectifier, bridge rectifier, L-section & π section filters, Transistor as series voltage regulator & shunt voltage regulator, three terminal voltage regulators, SMPS, Voltage doubler and Tripler working, SCR as Half & Full wave rectifiers, dielectric properties.
2. Student seminars (Individual presentation of papers) on topics relating to Rectifiers, filters, power supplies, three terminal IC voltage regulators, regulated power supply, SMPS, Voltage multipliers, SCR, SCR applications, heating effects of different materials.
3. Quiz Programmes on Rectifiers, filters, power supplies, voltage regulators, Voltage multipliers, SCR and heating effects.
4. Individual Field Studies/projects on three terminal IC voltage regulators, SCR as inverter.
5. Group discussion on Rectifiers and its types, power supplies, SCR.
6. Group/Team Projects on Designing SMPS.

General:

7. Collection of news reports and maintaining a record of paper-cuttings relating to topics covered in syllabus
8. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers
9. Any similar activities with imaginative thinking.

**CO-PO Mapping:**

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 3 | 3 | 3 | 1 | - | - | 1 | 3 | 3 | 2 | 3 |
| CO2 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 1 | 1 | 3 | 2 | 3 | 2 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 1 | - | 2 | 3 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | - | 1 | 1 | 3 | 3 | 2 | 3 |
| **Avg.** | | | | | | | | | | | | | | |

**P.R. GOVERNMENT COLLEGE (A), KAKINADA**

**B.Sc. III Year - Electronics – Semester – V**

w.e.f. 2021-22 ADMITTED BATCH PAPER – 6 A

[General Elective EL6205A]

# INDUSTRIAL ELECTRONICS

4 Hours/Week [Total: 60 hrs.] Credits: 04MODEL QUESTION PAPER

**Note: - Set the question paper as per the blue print given.**

Time: 2Hrs. Max. Marks: 50

| Section | Questions to be given | Questions to be answered | Marks |
|---|---|---|---|
| A | 6 | 3 | 3 x 10M = 30M |
| B | 7 | 4 | 4 x 5 M = 20M |
| Total | 13 | 7 | 50M |

Blue Print

| Module Name | Essay Questions [10 marks] | Short Questions [5 marks] | Marks allotted |
|---|---|---|---|
| **Rectifiers and filters Voltage Regulators** | 2 | 2 | 30 |
| **Power Supplies** | 1 | 2 | 20 |
| **Voltage Multipliers** | 1 | 1 | 15 |
| **Controlled rectifiers** | 1 | 1 | 15 |
| **Heat effects** | 1 | 1 | 15 |
| **Total Marks** | | | 95 |

**P.R. GOVERNMENT COLLEGE (A), KAKINADA**

**B.Sc. III Year - Electronics – Semester – V**

w.e.f. 2021-22 ADMITTED BATCH PAPER – 6 A

[General Elective EL6205A]

# INDUSTRIAL ELECTRONICS

## MODEL QUESTION PAPER

Time: 2 hrs. Max Marks: 50M

## Section - A

Answer any Three questions by choosing at least one question from each part

**3 X 10 = 30 M**

Part – A

1. Essay question from Module – 1
2. Essay question from Module – 1
3. Essay question from Module – 2

**Part – B**

4. Essay question from Module – 3
5. Essay question from Module – 4
6. Essay question from Module – 5

Section – B

**Answer any Four questions** **4 X 5 = 20 M**

7. Short answer question from Module - 1
8. Short answer question from Module - 1
9. Short answer question from Module - 2
10. Short answer question from Module - 2
11. Short answer question from Module - 3
12. Short answer question from Module - 4
13. Short answer question from Module - 5

| | P. R. College (Autonomous), Kakinada | Program & Semester: III B.Sc. Electronics (V Semester) Paper – VI A | | | |
|---|---|---|---|---|---|
| Course Code **EL6205AP** | **TITLE OF THE COURSE** **Industrial Electronics** | | | | |
| Demonstration | Hours Allocated: 30 (Practical) | L | T | P | C |
| Pre-requisites | Theoretical knowledge on power supplies, filters, regulators & SCR | - | - | 2 | 1 |

**Course Objectives:**

1. To understand the concepts of rectifiers, filters, power supplies & multipliers.
2. To identify various lab electrical instruments and their working.
3. To understand the properties and applications of different materials like resistor, inductor, capacitor.

**Course Outcomes:**

| On Completion of the course, the students will be able to | |
|---|---|
| CO1 | Construction of DC power supply and filters |
| CO2 | Identify the differences of shunt & series regulated power supplies. |
| CO3 | Construction of different IC voltage regulators |
| CO4 | Studied the characteristics and applications of SCR |

**Course with focus on employability / entrepreneurship / Skill Development modules**

Any **Five** experiments should be done

1. D.C Power supply and filters.
2. Transistor series regulator
3. Transistor as a shunt regulator
4. Voltage regulator using IC-7805and IC-7905.
5. Voltage doubler using diodes
6. Voltage Tripler using diodes
7. SCR VI characteristics.
8. SCR Series inverter
9. SCR parallel inverter.

## CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | - | - | 1 | 3 | 3 | 2 | 3 |
| CO2 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | - | - | 3 | 2 | 2 | 2 | 2 |
| CO3 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 1 | - | 3 | 3 | 2 | 2 | 2 |
| CO4 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | - | - | 2 | 3 | 3 | 3 | 3 |
| **Avg.** | | | | | | | | | | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | **P. R. College (Autonomous), Kakinada** | **Program & Semester** III B.Sc. Electronics (V Semester) Paper – VII A | | | |
| Course Code **EL7205A** | **TITLE OF THE COURSE Electronic Instrumentation** | | | | |
| Teaching | Hours Allocated: 60 (**Theory**) | L | T | P | C |
| Pre-requisites | Basics of CRO, Function generator, Multimeter | 4 | - | - | 4 |

**Course Objectives:**

1. To Identify various facilities required to set up a basic Instrumentation Laboratory.
2. To identify various lab electrical instruments and their working.
3. To Understand the Principle and operation of different display devices used in the display systems and different transducers.
4. To study the applications of various biomedical instruments in daily life like B.P. meter, ECG, Pulse oximeter etc. and know the handling procedures with safety and security.

**Course Outcomes:**

| On Completion of the course, the students will be able to | |
|---|---|
| CO1 | Acquire a critical knowledge of various Electrical Instruments used in the Laboratory. |
| CO2 | Demonstrate skills of using instruments like CRO, Function Generator, Multimeter etc. through hands on experience. |
| CO3 | Understand the Principle and operation of different display devices used in the display systems and different transducers |
| CO4 | Comprehend the applications of various biomedical instruments in daily life like B.P. meter, ECG, Pulse oximeter etc. and know the handling procedures with safety and security. |

**Course with focus on employability / entrepreneurship / Skill Development modules**

| | | | | | |
|---|---|---|---|---|---|
| **Skill Development** | | **Employability** | | **Entrepreneurship** | |

## SYLLABUS

**Module-I (12 hrs.)**

**Introduction to Instruments**: Types of electronic Instruments - Analog instruments & Digital Instruments, DC Voltmeter and AC Voltmeter, Construction and working of an Analog Multimeter and Digital Multimeter (Block diagram approach), Sensitivity,

3½display and 4½ display Digital multimeters, Basic ideas on Function generator. Block Diagram of Function Generator.

**Module-II** (12 hrs.)

**Oscilloscope:** Cathode Ray Oscilloscope-Introduction, Block diagram of basic CRO, Cathode ray tube, Electron gun assembly, Screen for CRT, Time base operation, Vertical deflection system, Horizontal deflection system, Use of CRO for the measurement of voltage (AC and DC), frequency, phase difference, Different types of oscilloscopes and uses.

**Module-III** (12 hrs.)

**Transducers:** Classification of transducers, Selection of transducers, Resistive, capacitive & inductive transducers, Resistive and capacitive touch screen transducer used in mobiles, Displacement transducer-LVDT, Piezoelectric transducer, Photo transducer, Digital transducer, Fiber optic sensors

OVERVIEW OF OPTICAL FIBER COMMUNICATION: Introduction, Historical development, general system, advantages, disadvantages, and applications of optical fiber communication

**Module-IV** (12 hrs.)

**Display Instruments:** Introduction to Display devices, Seven Segment Displays, LED Displays, Construction and operation (Display of numbers),Types of SSDs (Common Anode & Common Cathode type), Limitations of SSDs, Liquid Crystal Displays, Applications of LCD modules.

**Module-V** (12 hrs.)

**Biomedical Instruments:** Basic operating principles and uses of (i) Clinical thermometer (ii) Stethoscope (iii) Sphygmomanometer (iv) ECG machine (v) Radiography (vi) Ophthalmoscope (vii) Ultrasound scanning (viii) Pulse oximeter (ix) Glucometer, Basic ideas of CT scan and MRI scan.

Text books:


1. Electronic Instrumentation by H.S.Kalsi , TMH Publishers
2. Electronic Instrument Hand Book by Clyde F. Coombs , McGraw Hill
3. Introduction to Biomedical Instrumentation by Mandeep Singh, PHI Learning.
4. Biomedical Instrumentation and Measurements by Leslie Cromwell , Prentice Hall India.
5. Electronic Measurements and Instrumentation by Kishor, K Lal, Pearson, New Delhi
6. Electrical and Electronic Measurements by Sahan, A.K., Dhanpat Rai, New Delhi
7. Electronic Instruments and Measurement Techniques by Cooper, W.D.

Halfrick, A.B., PHI Learning, New Delhi

8. Web sources suggested by the teacher concerned and the college librarian including reading material.

Web Links:

1.
2.

## Activities proposed

Measurable:

1. Assignments on Electronic instruments, AC & DC voltmeter, Analog & Digital multimeter, Block diagram of CRO, Transducers & its types, fiber optic communication, seven segment displays, LED displays operational techniques with safety and security.
2. Student seminars (Individual presentation of papers) on topics Electronic instruments, DC & AC voltmeters, Analog & Digital electronics, Function generator, CRO & its working, Measurement of various attributes using CRO, applications of Transducers, Advantages, disadvantages & applications of fiber optic communication, Seven segment displays, LED displays, Types of SSDs, applications of LCDs.
3. Quiz Programmes on Electronic instruments, voltmeters, multimeters, transducers, CRO, optical fiber communication, display instruments.
4. Individual Field Studies/projects on stethoscope, seven-segment display.
5. Group discussion on applications of electronic instruments, applications of multimeters, applications of transducers, display instruments.
6. Group/Team Projects on designing a digital multimeter.
7. Preparation of videos on tools and techniques in various branches of instrumentation.
8. Collection of material/figures/photos related to products of Measuring Instruments, Display Modules and Biomedical Instruments and arrange them in a systematic way in a file.
9. Visits to Instrumentation Laboratories of local Universities or Industries like Cement, Chemical or Sugar Plants etc. or any nearby research organizations, private firms, etc.
10. Invited lectures and presentations on related topics by Technical /industrial experts.

General:

11. Collection of news reports and maintaining a record of paper-cuttings relating to topics covered in syllabus
12. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers
13. Any similar activities with imaginative thinking.

**CO-PO Mapping:**

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 3 | 3 | 3 | 1 | 1 | - | 1 | 3 | 3 | 1 | 3 |
| CO2 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 1 | - | 2 | 2 | 2 | 2 | 2 |
| CO3 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 3 | 3 | 3 | 2 | 2 |
| CO4 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | - | 1 | 1 | 2 | 3 | 3 | 3 |
| **Avg.** | | | | | | | | | | | | | | |

**P.R. GOVERNMENT COLLEGE (A), KAKINADA**

**B.Sc. III Year - Electronics – Semester – V**

w.e.f. 2021 - 22 ADMITTED BATCH PAPER – 7 A

[General Elective EL7205A]

## ELECTRONIC INSTRUMENTATION

4 Hours/Week [Total: 60 hrs.] Credits: 03MODEL QUESTION PAPER

**Note: - Set the question paper as per the blue print given.**

Time: 2Hrs Max. Marks: 50

| Section | Questions to be given | Questions to be answered | Marks |
|---|---|---|---|
| A | 6 | 3 | 3 x 10M = 30M |
| B | 7 | 4 | 4 x 5 M = 20M |
| Total | 13 | 7 | 50M |

Blue Print

| Module Name | Essay Questions [10 marks] | Short Questions [5 marks] | Marks allotted |
|---|---|---|---|
| **Rectifiers and filters Voltage Regulators** | 2 | 2 | 30 |
| **Power Supplies** | 1 | 2 | 20 |
| **Voltage Multipliers** | 1 | 1 | 15 |
| **Controlled rectifiers** | 1 | 1 | 15 |
| **Heat effects** | 1 | 1 | 15 |
| **Total Marks** | | | 95 |

**P.R. GOVERNMENT COLLEGE (A), KAKINADA**

**B.Sc. III Year - Electronics – Semester – V**

w.e.f. 2021- 22 ADMITTED BATCH PAPER – 7 A

[General Elective EL7205A]

# ELECTRONIC INSTRUMENTATION

## MODEL QUESTION PAPER

Time: 2 hrs. Max Marks: 50M

## Section - A

Answer any Three questions by choosing at least one question from each part

**3 X 10 = 30 M**

Part – A

1. Essay question from Module – 1
2. Essay question from Module – 2
3. Essay question from Module – 2

**Part – B**

4. Essay question from Module – 3
5. Essay question from Module – 4
6. Essay question from Module – 5

Section – B

**Answer any Four questions** **4 X 5 = 20 M**

7. Short answer question from Module - 1
8. Short answer question from Module - 1
9. Short answer question from Module - 2
10. Short answer question from Module - 2
11. Short answer question from Module - 3
12. Short answer question from Module - 4
13. Short answer question from Module - 5

| | P. R. College (Autonomous), Kakinada | Program & Semester: III B.Sc. Electronics (V Semester) Paper – VII A | | | |
|---|---|---|---|---|---|
| Course Code **EL7205AP** | **TITLE OF THE COURSE** **Electronic Instrumentation** | | | | |
| Demonstration | Hours Allocated: 30 (Practical) | L | T | P | C |
| Pre-requisites | Theoretical knowledge on multimeters, CRO, seven segment displays | - | - | 2 | 1 |

**Course Objectives:**

1. List out, identify and handle various equipment in Instrumentation Laboratory or Electronic Laboratory.
2. To identify various lab electrical instruments and their working.

**Course Outcomes:**

| On Completion of the course, the students will be able to | |
|---|---|
| CO1 | Learn the construction, operational principles of various instruments. |
| CO2 | Demonstrate skills in handling, Maintenance & troubleshooting of different instruments used in the Labs. |
| CO3 | Acquire skills in observing and measuring various electrical and electronic quantities. |
| CO4 | Perform some techniques related to Biomedical Instrumentation and measurement of Certain physiological parameters like body temperature, B.P. and sugar levels etc. |

**Course with focus on employability / entrepreneurship / Skill Development modules**

Any **Five** experiments should be done

1. Familiarization of digital multimeter and its usage in the measurements of (i) resistance, (ii) current, (iii) AC & DC voltages and for (i) continuity test (ii)diode test and (iii) transistor test.
2. Measure the AC and DC voltages, frequency using a CRO and compare the values Measured with other instruments like Digital Multimeter.
3. Formation of Sine, Square wave signals on the CRO using Function Generator and measure their frequencies. Compare the measured values with actual values.
4. Display the numbers from 0 to 9 on a single Seven Segment Display module by Applying voltages.
5. Display the letters **a** to **h** on a single Seven Segment Display module by applying voltages.
6. Measurement of body temperature using a digital thermometer and list out the error

and corrections.

7. Measurement of Blood Pressure of a person using a B.P. meter and record the values and analyze them.
8. Get acquainted with an available ECG machine and study the ECG pattern to understand the meaning of various peaks

## CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 2 | 3 | 3 | 3 | 1 | - | - | 1 | 3 | 3 | 2 | 2 |
| CO2 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | - | - | 2 | 2 | 2 | 2 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | - | - | 2 | 3 | 2 | 1 | 2 |
| CO4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | - | - | 1 | 3 | 3 | 2 | 3 |
| **Avg.** | | | | | | | | | | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | **P. R. College (Autonomous), Kakinada** | **Program & Semester** III B.Sc. Electronics (V Semester) Paper – VI B | | | |
| Course Code **EL6205B** | **TITLE OF THE COURSE Embedded Systems Design** | | | | |
| Teaching | Hours Allocated: 60 (**Theory**) | L | T | P | C |
| Pre-requisites | | 4 | - | - | 4 |

**Course Objectives:**

1. Design embedded computer system hardware.
2. Design, implement, and debug multi-threaded application software that operates under real-time constraints on embedded computer systems.
3. Use and describe the implementation of a real-time operating system on an embedded computer system.
4. Formulate an embedded computer system design problem including multiple constraints, create a design that satisfies the constraints, implement the design in hardware and software, and measure performance against the design constraints.
5. Create computer software and hardware implementations that operate according to well-known standards.

**Course Outcomes:**

| On Completion of the course, the students will be able to | |
|---|---|
| CO1 | The student can gain good knowledge on Embedded Systems and implement in practical applications. |
| CO2 | To study advanced communication principles. |
| CO3 | An ability effectively as a member or leader on a technical team. |
| CO4 | A commitment to quality, timeliness and continuous improvement. |

**Course with focus on employability / entrepreneurship / Skill Development modules**

| | | | | | |
|---|---|---|---|---|---|
| **Skill Development** | | **Employability** | | **Entrepreneurship** | |

## SYLLABUS

**MODULE - 1: (10 Hrs.)**
**Introduction to Embedded Systems:**

Embedded systems overview, Design Challenge, Processor Technology, IC Technology, and Design Technology.

**MODULE - 2: (15 Hrs.)**
**Custom Single Purpose Processor – Hardware Development:**

Introduction, Combinational logic, Sequential logic, Custom Single Purpose Processor Design, RT-Level Custom Single-Purpose Processor.

MODULE - 3: (15 Hrs.)

**General Purpose Processor – Software Development:**

Introduction, Basic Architecture, Operation, Programmer's View, ASIPs, and Development Environment: Host and Target Machines, Linker / Locators for Embedded Software, Getting Embedded Software into the target system. Debugging Techniques: Testing on your Host Machine, and Instruction Set Simulators.

MODULE - 4: (10 Hrs.)

**RTWA for Embedded Systems:**

Introduction, Timers, Counters and Watchdog Timers, UART, Pulse Width Modulators, Stepper Motor Controllers, Analog – to – Digital Converters, and Real Time Clocks.

MODULE -5: (10 Hrs.)

**Advanced Communication Principles:**

Parallel Communication, Serial Communication, Wireless Communication, **Serial Protocols**: $I^2C$, CAN, FireWire, and USB. **Parallel Protocols**: PCI BUS and ARM BUS. **Wireless Protocols**: IrDA, Bluetooth, and IEEE 802.11.

Text books:

1. Embedded System Design – A Unified Hardware / Software Introduction By **Frank Vahid / Tony Givargis** – WILEY EDITION.
2. Embedded Systems Architecture, Programming and Design – 2nd Edition By **Raj Kamal** – Tata McGraw-Hill Education.

Reference books:

1. An Embedded Software Premier - **David E- Siman**, PEARSON Education
2. Education Embedded / real - time systems - **DR. K.V.K.K. Prasad**, dreamtech
3. The art of programming Embedded systems, **Jack G. Ganssle**, academic press
4. Intelligent Embedded systems, **Louis L. Odette, Adison Wesley**, 1991

Web Links:

1.
2.

Activities proposed

Measurable:

1. Assignments on processor technology, IC technology, design technology, RT-Level custom single purpose processor, ASIP, Embedded software, debugging techniques, Instruction set of simulators, Timers, counters, stepper motor controllers, A/D converters, Real time clocks, Firewire, USB, Bluetooth, IEEE 802.11.
2. Student seminars (Individual presentation of papers) on topics relating Processor technology, IC technology, Design technology, hardware development of single purpose processor, software development of processor, RTWA for embedded systems, serial communication & parallel communication, wireless protocols.
3. Quiz Programmes on Processor technology, IC technology, Design technology, hardware development of single purpose processor, software development of processor, RTWA for embedded systems, serial communication & parallel communication, wireless protocols.
4. Individual Field Studies/projects on wireless protocols.
5. Group discussion on advanced communication principles.
6. Group/Team Projects on design a gadget using wireless protocols like Bluetooth.

General:

7. Collection of news reports and maintaining a record of paper-cuttings relating to topics covered in syllabus
8. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers
9. Any similar activities with imaginative thinking.

**CO-PO Mapping:**

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 3 | 3 | 3 | 1 | - | - | 1 | 3 | 3 | 1 | 3 |
| CO2 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 1 | 1 | 3 | 2 | 2 | 2 | 2 |
| CO3 | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 1 | 1 | 2 | 2 | 3 | 2 | 2 |
| CO4 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | - | 1 | 1 | 3 | 3 | 3 | 3 |
| **Avg.** | | | | | | | | | | | | | | |

**P.R. GOVERNMENT COLLEGE (A), KAKINADA**

**B.Sc. III Year - Electronics – Semester – V**

w.e.f. 2021-22 ADMITTED BATCH PAPER – 6 B

[General Elective EL6205B]

## EMBEDDED SYSTEMS DESIGN

4 Hours/Week [Total: 60 hrs.] Credits: 04

## MODEL QUESTION PAPER

Note: - Set the question paper as per the blue print given.

**Time: 2Hrs.** **Max. Marks: 50**

| Section | Questions to be given | Questions to be answered | Marks |
|---|---|---|---|
| A | 6 | 3 | 3 x 10M = 30M |
| B | 7 | 4 | 4 x 5 M = 20M |
| Total | 13 | 7 | 50M |

Blue Print

| Module Name | Essay Questions [10 marks] | Short Questions [5 marks] | Marks allotted |
|---|---|---|---|
| **Rectifiers and filters Voltage Regulators** | 2 | 2 | 30 |
| **Power Supplies** | 1 | 2 | 20 |
| **Voltage Multipliers** | 1 | 1 | 15 |
| **Controlled rectifiers** | 1 | 1 | 15 |
| **Heat effects** | 1 | 1 | 15 |
| **Total Marks** | | | 95 |

**P.R. GOVERNMENT COLLEGE (A), KAKINADA**

**B.Sc. III Year - Electronics – Semester – V**

w.e.f. 2021-22 ADMITTED BATCH PAPER – 6 B

[General Elective EL6205B]

# EMBEDDED SYSTEMS DESIGN

## MODEL QUESTION PAPER

Time: 2 hrs. Max Marks: 50M

## Section - A

Answer any Three questions by choosing at least one question from each part

**3 X 10 = 30 M**

Part – A

1. Essay question from Module – 1
2. Essay question from Module – 2
3. Essay question from Module – 3

**Part – B**

4. Essay question from Module – 3
5. Essay question from Module – 4
6. Essay question from Module – 5

Section – B

**Answer any Four questions** **4 X 5 = 20 M**

7. Short answer question from Module - 1
8. Short answer question from Module - 1
9. Short answer question from Module - 2
10. Short answer question from Module - 2
11. Short answer question from Module - 3
12. Short answer question from Module - 4
13. Short answer question from Module - 5

PAPER – 6 B [General Elective EL6205B]

EMBEDDED SYSTEMS DESIGN QUESTION BANK

## MODULE - I: Introduction to Embedded Systems

### ESSAY QUESTIONS

1. Explain Embedded systems overview and Design Challenge, Processor Technology,
2. Explain IC Technology and Design Technology.

SHORT ANSWER QUESTIONS

3. Describe processor Technology.
4. Discuss IC Technology and Design Technology.

## MODULE - II: Custom Single Purpose Processor – Hardware Development

ESSAY QUESTIONS

5. Explain Custom Single Purpose Processor Design
6. Evaluate RT-Level custom single-purpose processor.

SHORT ANSWER QUESTIONS

7. Describe Combinational Logic.
8. Explain Sequential Logic.

## MODULE - III: General Purpose Processor – Software Development

ESSAY QUESTIONS

9. Explain Linker / Locators for Embedded Software.
10. Give basic architecture of processor and explain its operation.
11. How can you get Embedded Software into the target system.

SHORT ANSWER QUESTIONS

12. Describe Host and Target Machines.
13. Explain Programmer 's View.
14. Explain ASIPs.

## MODULE - IV: RTWA for Embedded Systems

ESSAY QUESTIONS

15. Describe Analog – to – Digital Converters.
16. Explain Real Time Clocks.

SHORT ANSWER QUESTIONS

17. Discuss Pulse Width Modulators.
18. Describe Timers, counters.
19. Explain UART, Watchdog Timers.
20. Explain Stepper Motor Controllers.

## MODULE - V: Advanced Communication Principles

### ESSAY QUESTIONS

21. Explain communication? Explain Parallel Communication.
22. Define communication? Explain Serial Communication.
23. Describe communication and Explain Wireless communication.

### SHORT ANSWER QUESTIONS

24. Describe protocol, explain Serial protocol of CAN.
25. Describe protocol, explain Serial protocol of USB.
26. Describe protocol, explain Parallel protocol PCI BUS.
27. Describe protocol, explain Parallel protocol ARM BUS.
28. Describe protocol, explain serial protocol of I2C.
29. Describe protocol, explain serial protocol of FireWire
30. Discuss wireless protocol. Explain any one of them.
31. Describe Bluetooth.
32. Explain IEEE 802.11. & IrDA.

| | P. R. College (Autonomous), Kakinada | Program & Semester: III B.Sc. Electronics (V Semester) Paper – VI B | | | |
|---|---|---|---|---|---|
| Course Code **EL6205BP** | **TITLE OF THE COURSE** **Embedded systems design** | | | | |
| Demonstration | Hours Allocated: 30 (Practical) | L | T | P | C |
| Pre-requisites | | - | - | 2 | 1 |

**Course Objectives:**

1. To develop programs for different applications.
2. To Interface 8051 with D/A & A/D converter and generate different types of wave forms.
3. To generate traffic signals using embedded systems.
4. To control temperature by using embedded systems.

**Course Outcomes:**

| On Completion of the course, the students will be able to | |
|---|---|
| CO1 | Develop a program to generate time delay. |
| CO2 | Interfacing of 8051 with D/A converter and generate different types of wave forms . |
| CO3 | Interfacing of 8051 with stepper motor and controlling of clock angle. |
| CO4 | Generate traffic signals. |

**Course with focus on employability / entrepreneurship / Skill Development modules**

Any **Five** experiments should be done

1. Configure timer control registers of 8051 and develop a program to generate given time delay.
2. Port I/O: Use one of the four ports of 8051 for O/P interfaced to eight LED's. Simulate binary counter (8 bit) on LED's.
3. Serial I/O: Configure 8051 serial port for asynchronous serial communication with serial port of PC exchange text messages to PC and display on PC screen. Signify end of message by carriage return.
4. Interface 8051 with D/A converter and generate square wave of given frequency on oscilloscope.
5. Interface 8051 with D/A converter and generate triangular wave of given frequency on oscilloscope.
6. Using D/A converter generate sine wave on oscilloscope with the help of lookup table stored in data area of 8051.

7. Interface Stepper motor with 8051 and write a program to move the motor through a given angle in clock wise or counter clock wise direction.
8. Generate traffic signal.
9. Temperature controller.
10. Elevator control.

## CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 3 | 3 | 3 | 1 | - | - | 1 | 3 | 3 | 2 | 3 |
| CO2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | - | - | 2 | 2 | 2 | 2 | 2 |
| CO3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | - | - | 3 | 3 | 2 | 2 | 2 |
| CO4 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | - | - | 1 | 2 | 3 | 2 | 3 |
| **Avg.** | | | | | | | | | | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | **P. R. College (Autonomous), Kakinada** | **Program & Semester** III B.Sc. Electronics (V Semester) Paper – VII B | | | |
| Course Code **EL7205B** | **TITLE OF THE COURSE Consumer Electronics** | | | | |
| Teaching | Hours Allocated: 60 (**Theory**) | L | T | P | C |
| Pre-requisites | | 4 | - | - | 4 |

**Course Objectives:**

1. To study Microwave ovens – block diagram - working - types – wiring and safety instructions. – care and cleaning.
2. To study washing machines – block diagram - working - types – wiring and safety instructions. – care and cleaning.
3. To study Air conditioners and refrigerators – block diagram - working - types – wiring and safety instructions. – care and cleaning.
4. To study Home/Office digital devices – block diagram - working - types – wiring and safety instructions. – care and cleaning.
5. To study Digital access devices like – block diagram - working - types – wiring and safety instructions. – care and cleaning.

**Course Outcomes:**

| **On Completion of the course, the students will be able to** | |
|---|---|
| CO1 | The student can gain a good knowledge of microwave ovens and implement them in practical applications. |
| CO2 | The student can gain a good knowledge of Washing Machines and implement in practical applications. |
| CO3 | The student can gain a good knowledge of Air conditioners and Refrigerators and implement them in practical applications. |
| CO4 | The student can gain a good knowledge of Digital access devices and implement in practical applications. |

**Course with focus on employability / entrepreneurship / Skill Development modules**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Skill Development** | | | **Employability** | | | **Entrepreneurship** | |

## SYLLABUS

**Module – I (12 hrs.):**

**Microwave Ovens:** Microwaves (Range used in Microwave ovens) – Microwave oven block diagram – LCD timer with alarm – Single-Chip Controllers – types of Microwave oven – Wiring and Safety instructions – care and Cleaning.

Module - II (12 hrs.):

**Washing Machines:** Electronic controller for washing machines – Washing machine hardware and software – Types of washing machines – Fuzzy logic washing machines Features of washing machines.

Module – III (12 hrs.):

**Air Conditioners and Refrigerators:** Air Conditioning – Components of air conditioning systems – All water air conditioning systems – All air conditioning systems – Modularly and central air conditioning systems – Split air conditioners.

Module – IV (12 hrs.):

**Home/Office Digital Devices:** Facsimile machine – Xerographic copier – calculators – Structure of a calculator – Internal organization of a calculator – Servicing electronic calculators – Digital clocks – Block diagram of a digital clock.

Module – V (12 hrs.):

**Digital Access Devices:** Digital computer – Internet access – online ticket reservation – functions and networks – barcode scanner and decoder – Electronic Fund Transfer – Automated Teller Machines(ATMs) – Set-Top boxes – Digital cable TV – Video on demand.

Text books:


1. S.P. Bali, Consumer Electronics - Pearson Education, New Delhi, 2005.
2. R. G. Gupta Audio and Video systems Tata McGraw Hill (2004)


Web Links:

1.
2.

Activities proposed

Measurable:

1. Assignments on Block diagram of Microwave oven, types of microwave oven,

software and software of washing machines, types of washing machine, features of washing machines, Components of washing machines, all water air conditioning system, all air conditioning systems, facsimile machine, xerographic copier, calculators, Digital computer, online ticket reservation, Automated teller machines(ATMs).

2. Student seminars (Individual presentation of papers) on topics Microwave oven, types of washing machine, features of washing machines, Components of washing machines, all water air conditioning system, all air conditioning systems, split air conditioners, servicing of electronic calculators, Digital clocks, internet access, barcode scanner and decoder, set-top boxes, digital cable TV.
3. Quiz Programmes on microwave oven, washing machines, air conditioners and refrigerators, Home/office devices, digital access devices.
4. Individual Field Studies/projects on working mechanism of washing machines, air conditioners, refrigerators and different digital devices.
5. Group discussion on applications of electronic instruments.
6. Group/Team Projects on servicing of refrigerator, washing machines, air conditioners, xerographic copier.

General:

7. Collection of news reports and maintaining a record of paper-cuttings relating to topics covered in syllabus
8. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers
9. Any similar activities with imaginative thinking.

**CO-PO Mapping:**

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 3 | 3 | 3 | 1 | 1 | - | 1 | 3 | 3 | 1 | 3 |
| CO2 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 1 | - | 3 | 2 | 2 | 2 | 3 |
| CO3 | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 3 | 3 | 2 |
| CO4 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 1 | 1 | 1 | 3 | 3 | 2 | 3 |
| **Avg.** | | | | | | | | | | | | | | |

**P.R. GOVERNMENT COLLEGE (A), KAKINADA**

**B.Sc. III Year - Electronics – Semester – V**

w.e.f. 2020 - 21 ADMITTED BATCH PAPER – 7 B

[General Elective EL7205B]

## CONSUMER ELECTRONICS

4 Hours/Week [Total: 60 hrs.] Credits: 04

## MODEL QUESTION PAPER

Note: - Set the question paper as per the blue print given.

**Time: 2Hrs.** **Max. Marks: 50**

| Section | Questions to be given | Questions to be answered | Marks |
|---|---|---|---|
| A | 6 | 3 | 3 x 10M = 30M |
| B | 7 | 4 | 4 x 5 M = 20M |
| Total | 13 | 7 | 50M |

Blue Print

| Module Name | Essay Questions [10 marks] | Short Questions [5 marks] | Marks allotted |
|---|---|---|---|
| **Microwave oven** | 2 | 2 | 30 |
| **Washing machines** | 1 | 2 | 20 |
| **Air conditioners & Refrigerators** | 1 | 1 | 15 |
| **Home/Office digital devices** | 1 | 1 | 15 |
| **Digital access devices** | 1 | 1 | 15 |
| **Total Marks** | | | 95 |

**P.R. GOVERNMENT COLLEGE (A), KAKINADA**

**B.Sc. III Year - Electronics – Semester – V**

w.e.f. 2021 - 22 ADMITTED BATCH PAPER – 7 B

[General Elective EL7205B]

## CONSUMER ELECTRONICS

## MODEL QUESTION PAPER

Time: 2 hrs. Max Marks: 50M

### Section - A

Answer any Three questions by choosing at least one question from each part

**3 X 10 = 30 M**

1. Essay question from Module – 1
2. Essay question from Module – 2
3. Essay question from Module – 2

4. Essay question from Module – 3
5. Essay question from Module – 4
6. Essay question from Module – 5

Section – B

**Answer any Four questions** **4x5=20M** **= 20 M**

7. Short answer question from Module - 1
8. Short answer question from Module - 1
9. Short answer question from Module - 1
10. Short answer question from Module - 2
11. Short answer question from Module - 2
12. Short answer question from Module - 3
13. Short answer question from Module - 3

**Course Objectives:**

1. To study the working of different instruments/appliances.
2. To install and uninstall of different appliances.
3. To survey of products.
4. To identify a problem and learn how to troubleshoot.

**Course Outcomes:**

| On Completion of the course, the students will be able to | |
|---|---|
| CO1 | Studied the working of different instruments/appliances. |
| CO2 | Installation and uninstallation of different appliances. |
| CO3 | Survey of different products. |
| CO4 | Identify problem and its trouble shooting. |

**Course with focus on employability / entrepreneurship / Skill Development modules**

| | P. R. College (Autonomous), Kakinada | Program & Semester III B.Sc. Electronics (V Semester) Paper – VII B | | | |
|---|---|---|---|---|---|
| Course Code **EL7205BP** | **TITLE OF THE COURSE** **Consumer Electronics** | | | | |
| Demonstration | Hours Allocated: 30 (Practical) | L | T | P | C |
| Pre-requisites | | - | - | 2 | 1 |

At least two Activities should be done

1. Study of PA systems for various situations - Public gathering, closed theatre/Auditorium, Conference room, Prepare Bill of Material (Costing).
2. Installation of Audio /Video systems - site preparation, electrical requirements, cables and connectors.
3. Market Survey of Products ( at least one from each module).
4. Identification of block and tracing the system.
   Assembly and Disassembly of system using Toolkit.
5. Assembly and Disassembly of system & printer

NOTE: One activity as directed in practical course is equivalent to 4 experiments 5

## CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 2 | 3 | 3 | 1 | - | - | 1 | 3 | 3 | 2 | 3 |
| CO2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | - | - | 2 | 2 | 2 | 2 | 2 |
| CO3 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | - | - | 2 | 3 | 2 | 3 | 2 |
| CO4 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | - | - | 1 | 2 | 3 | 2 | 3 |
| **Avg.** | | | | | | | | | | | | | | |

| | P. R. College (Autonomous), Kakinada | Program & Semester<br><br>III B.Sc. Electronics (V Semester) Paper – VI C | | | |
|---|---|---|---|---|---|
| Course Code **EL6205C** | **TITLE OF THE COURSE** **VLSI Design** | | | | |
| Teaching | Hours Allocated: 60 (**Theory**) | L | T | P | C |
| Pre-requisites | CMOS circuits | 4 | - | - | 4 |

**Course Objectives:**

1. To learn basic CMOS circuits.
2. To learn CMOS process technology.
3. To design technologies of chip design using programming devices.
4. To learn the concepts of designing VLSI subsystems.

**Course Outcomes:**

| On Completion of the course, the students will be able to | |
|---|---|
| CO1 | Identify the various IC fabrication methods. |
| CO2 | Acquire knowledge on CMOS process technology. |
| CO3 | Concepts of modeling a digital system using Hardware Description Language (HDL) |
| CO4 | Design analog & digital CMOS circuits for specified applications. |

**Course with focus on employability / entrepreneurship / Skill Development modules**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Skill Development** | | | **Employability** | | | **Entrepreneurship** | |

## SYLLABUS

Module-I (12 hrs.)

Integrated Circuit- Definition, Classification's, and Advantages of IC's – MOS Transistors: Enhancement type, Depletion type, Modes of NMOS – CMOS, Fabrications: n-Well, p-Well.

Module-II (11 hrs.)

NMOS Inverter – CMOS inverter – VLSI Design Flow: Design Specification's Design Entry – Examples of (Circuit Diagrams only) NMOS, PMOS and CMOS.

Module-III (11 hrs.)

Basic logic gates in CMOS – Complex logic gate: Two, Three inputs of CMOS NAND gate – Combinational Logic: Two and Three inputs of CMOS NOR gate – Compound gates in CMOS.

Module-IV (13 hrs.)

**VHDL**: Brief History, Logical, Relational, Arithmetic, Shift and Rotate Operators, Data types.

**Verilog HDL**: Brief History, Logical, Relational, Arithmetic, Shift and Rotate Operators, Data types – Comparison of VHDL and Verilog HDL.

Module-V (13 hrs.)

Data – Flow Description's and HDL programs:-

Basic Logic Gates, Universal Gates, Half-Adder, Multiplexer, Magnitude Comparator, Binary Adder.

Text books:

1. VLSI Design by Vilas S.Baged.
2. VHDL and Verilog programming By Nazeih M.Botros.
3. VLSI Design By A.Albert Raj and T.Latha.

Web Links:

1.
2.

Activities proposed

Measurable:

1. Assignments on Classification and advantages of IC's, Types of MOS transistors, VLSI design flow, Basic logic gates in CMOS, Concept of VHDL, Concept of Verilog HDL, comparison of VHDL & Verilog HDL, HDL programs.

2. Student seminars (Individual presentation of papers) on topics relating to Enhancement MOS transistor, Depletion MOS transistor, Modes of NMOS & CMOS, fabrication techniques, NMOS inverter & CMOS inverter, compound gates, VHDL, Verilog HDL, circuits of gates.
3. Quiz Programmes on ICs, VLSI design, basic logic gates in CMOS, VHDL, Verilog VHDL, Logic gates.
4. Individual Field Studies on Verilog HDL.
5. Group discussion on fabrication methods, NMOS & CMOS inverters, Verilog HDL.

General:

6. Collection of news reports and maintaining a record of paper-cuttings relating to topics covered in syllabus
7. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers
8. Any similar activities with imaginative thinking.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | - | 1 | 1 | 3 | 3 | 1 | 3 |
| CO2 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 1 | - | 3 | 2 | 2 | 2 | 3 |
| CO3 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 2 | 3 | 3 | 3 | 2 |
| CO4 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 1 | 1 | 1 | 3 | 3 | 2 | 3 |
| **Avg.** | | | | | | | | | | | | | | |

**P.R. GOVERNMENT COLLEGE (A), KAKINADA**

**B.Sc. III Year - Electronics – Semester – V**

w.e.f. 2021-22 ADMITTED BATCH PAPER – 6 C

[General Elective EL6205C]

# VLSI Design

4 Hours/Week [Total: 60 hrs.] Credits: 03MODEL QUESTION PAPER

**Note: - Set the question paper as per the blue print given.**

Time: 2Hrs. Max. Marks: 50

| Section | Questions to be given | Questions to be answered | Marks |
|---|---|---|---|
| A | 6 | 3 | 3 x 10M = 30M |
| B | 7 | 4 | 4x 5 M = 20M |
| Total | 13 | 7 | 50M |

Blue Print

| Module Name | Essay Questions [10 marks] | Short Questions [5 marks] | Marks allotted |
|---|---|---|---|
| Module – I | 1 | 2 | 20 |
| Module - II | 1 | 2 | 20 |
| Module - III | 1 | 1 | 15 |
| Module – IV | 2 | 1 | 25 |
| Module - V | 1 | 1 | 15 |
| **Total Marks** | | | 95 |

**P.R. GOVERNMENT COLLEGE (A), KAKINADA**

**B.Sc. III Year - Electronics – Semester – V**

w.e.f. 2021-22 ADMITTED BATCH PAPER – 6 C

[EL6205C] Elec tive [General

# VLSI Design

## MODEL QUESTION PAPER

Time: 2 hrs. Max Marks: 50M

## Section - A

Answer any Three questions by choosing at least one question from each part

**3 X 10 = 30 M**

Part – A

1. Essay question from Module – 1
2. Essay question from Module – 2
3. Essay question from Module – 3

**Part – B**

4. Essay question from Module – 4
5. Essay question from Module – 4
6. Essay question from Module – 5

Section – B

**Answer any Four questions** **4 X 5 = 20 M**

7. Short answer question from Module - 1
8. Short answer question from Module - 1
9. Short answer question from Module - 2
10. Short answer question from Module - 2
11. Short answer question from Module - 3
12. Short answer question from Module - 4
13. Short answer question from Module - 5

| | P. R. College (Autonomous), Kakinada | Program & Semester III B.Sc. Electronics (V Semester) Paper – VI C | | | |
|---|---|---|---|---|---|
| Course Code **EL6205CP** | **TITLE OF THE COURSE VLSI Design** | | | | |
| Demonstration | Hours Allocated: 30 (Practical) | L | T | P | C |
| Pre-requisites | | - | - | 2 | 1 |

**Course Objectives:**

1. To develop programs for different applications.
2. To Interface 8051 with D/A & A/D converter and generate different types of wave forms.
3. To generate traffic signals using embedded systems.
4. To control temperature by using embedded systems.

**Course Outcomes:**

| On Completion of the course, the students will be able to | |
|---|---|
| CO1 | Concepts of modeling a digital system using HDL. |
| CO2 | Study of different circuits. |
| CO3 | Learnt the concepts of designing VLSI subsystems. |
| CO4 | Design of various circuits. |

**Course with focus on employability / entrepreneurship / Skill Development modules**

**Any Five experiments should be done**

1) Basic Gates Circuit
2) Universal Gates
3) Half –Adder
4) Full –Adder
5) Multiplexer
6) Decoder
7) S-R Latch
8) D-Latch
9) Magnitude Comparator
10) Binary Adder

OR

**STUDENTS HAS TO DO A GROUP PROJECT WORK DURING THIS SEMISTER**

## CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 2 | 3 | 3 | 3 | 1 | - | - | 1 | 3 | 3 | 2 | 3 |
| CO2 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | - | - | 2 | 2 | 2 | 2 | 2 |
| CO3 | 2 | 3 | 3 | 2 | 3 | 2 | 1 | - | - | 2 | 3 | 2 | 3 | 2 |
| CO4 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | - | - | 1 | 2 | 3 | 2 | 3 |
| **Avg.** | | | | | | | | | | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | **P. R. College (Autonomous), Kakinada** | **Program & Semester** III B.Sc. Electronics (V Semester) Paper – VII C | | | |
| Course Code **EL7205C** | **TITLE OF THE COURSE Data Communication & Networking** | | | | |
| Teaching | Hours Allocated: 60 (**Theory**) | L | T | P | C |
| Pre-requisites | | 4 | - | - | 4 |

**Course Objectives:**

1. To study about network topologies like bus, star, ring, mesh tree, hybrid .
2. To study about transmission media.
3. To study about data transmission types.
4. To study multiplexing techniques and modems.

**Course Outcomes:**

| On Completion of the course, the students will be able to | |
|---|---|
| CO1 | Created awareness on network and its types & also on network topologies. |
| CO2 | Studied about different types of transmission media. |
| CO3 | Knowledge on different types of data transmissions. |
| CO4 | Acquire knowledge on different multiplexing techniques and modems. |

**Course with focus on employability / entrepreneurship / Skill Development modules**

| | | | | | |
|---|---|---|---|---|---|
| **Skill Development** | | **Employability** | | **Entrepreneurship** | |

## SYLLABUS

**Module –I (12 Hrs.):**

Data Communication and its Components – Introducing of Network, Types of Networks: Personal Area Network, wide Area Network.

**Module-II (14 hrs.):**

Network Topologies: Bus Topology, Star Topology, Ring Topology, Mesh Topology, Tree Topology, Hybrid, Topology

**MODULE-III (10 Hrs.):**

Transmission Media's - Guided Media: Twisted pair Cable, Coaxial Cable, Optical Fiber Cable. Un-Guide Media: Radio Waves, Microwaves, Infrared.

**MODULE-IV (10 Hrs.)**:

Data Transmissions: Digital – To – Digital Conversion (line coding only), Analog – To – Digital Conversion (PCM only), Digital – To – Analog (ASK only) Analog – To – Analog Transmission (AM only) – Transmission Modes (Parallel and Serial).

MODULE – V (14 Hrs.):

Frequency Division Multiplexing, Time Division Multiplexing Wave Division Multiplexing. Modems: Traditional Modems, Cable Modems.

Text books:

1. Data communication and Networking (2 Edition) By Behrouz A.Forouzan.
2. Data and Communication by Stallings Williams.
3. Computer Networks By Kurose James F

Web Links:

1.
2.

Activities proposed

Measurable:

1. Assignments on Personal area network, wide area network, network topologies, guided media, un-guide media, data transmissions, transmission modes, multiplexing techniques and types of modems.
2. Student seminars (Individual presentation of papers) on topics data communication and its components, types of networks and its advantages, network topologies and its advantages, transmission media, PCM, ASK, AM, transmission modes, FDMA, TDMA and modems
3. Quiz Programmes on networks, network topologies, transmission media, data transmissions, multiplexing techniques and modems.
4. Individual Field Studies/projects on different types of topologies and different types of transmission media.
5. Group discussion on network topologies, transmission media, data transmissions, multiplexing techniques.
6. Group/Team Projects on providing LAN to computer lab.

General:

7. Collection of news reports and maintaining a record of paper-cuttings relating to topics covered in syllabus
8. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers

9. Any similar activities with imaginative thinking.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | - | - | 1 | 3 | 3 | 2 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 2 | 2 | 3 | 2 | 3 |
| CO3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | - | 1 | 3 | 3 | 2 | 2 | 2 |
| CO4 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | - | 1 | 1 | 3 | 3 | 2 | 3 |
| **Avg.** | | | | | | | | | | | | | | |

**P.R. GOVERNMENT COLLEGE (A), KAKINADA**

**B.Sc. III Year - Electronics – Semester – V**

w.e.f. 2021 – 22 ADMITTED BATCH PAPER – 7 C

[General Elective EL7205C]

## Data Communication & Networking

4 Hours/Week [Total: 60 hrs.] Credits: 03MODEL QUESTION PAPER

**Note: - Set the question paper as per the blue print given.**

Time: 2Hrs. Max. Marks: 50

| Section | Questions to be given | Questions to be answered | Marks |
|---|---|---|---|
| A | 6 | 3 | 3 x 10M = 30M |
| B | 7 | 4 | 4 x 5 M = 20M |
| Total | 13 | 7 | 50M |

Blue Print

| Module Name | Essay Questions [10 marks] | Short Questions [5 marks] | Marks allotted |
|---|---|---|---|
| Module – I | 1 | 2 | 20 |
| Module - II | 2 | 1 | 25 |
| Module - III | 1 | 2 | 20 |
| Module – IV | 1 | 1 | 15 |
| Module - V | 1 | 1 | 15 |
| **Total Marks** | | | 95 |

**P.R. GOVERNMENT COLLEGE (A), KAKINADA**

**B.Sc. III Year - Electronics – Semester – V**

w.e.f. 2021 - 22 ADMITTED BATCH PAPER – 7 C

[General Elective EL7205C]

## Data Communication & Networking

## MODEL QUESTION PAPER

Time: 2 hrs. Max Marks: 50M

### Section - A

Answer any Three questions by choosing at least one question from each part

**3 X 10 = 30 M**

Part – A

1. Essay question from Module – 1
2. Essay question from Module – 2
3. Essay question from Module – 2

**Part – B**

4. Essay question from Module – 3
5. Essay question from Module – 4
6. Essay question from Module – 5

Section – B

**Answer any Four questions** **4 X 5 = 20 M**

7. Short answer question from Module - 1
8. Short answer question from Module - 1
9. Short answer question from Module - 2
10. Short answer question from Module - 3
11. Short answer question from Module - 3
12. Short answer question from Module - 4
13. Short answer question from Module - 5

| | P. R. College (Autonomous), Kakinada | Program & Semester III B.Sc. Electronics (V Semester) Paper – VII C | | | |
|---|---|---|---|---|---|
| Course Code **EL7205CP** | **TITLE OF THE COURSE Data Communication & Networking** | | | | |
| Demonstration | Hours Allocated: 30 (Practical) | L | T | P | C |
| Pre-requisites | | - | - | 2 | 1 |

**Course Objectives:**

1. To study about network topologies like bus, star, tree.
2. To study about different transmission media.
3. To study about interfacing of ports.
4. To Convert different types of data.

**Course Outcomes:**

| On Completion of the course, the students will be able to | |
|---|---|
| CO1 | Studied about different types of topologies like bus, star & tree. |
| CO2 | Aware of different transmission media and their advantages. |
| CO3 | Observe different data transfer techniques & interfacing of ports . |
| CO4 | Acquire knowledge on different types of data conversions. |

**Course with focus on employability / entrepreneurship / Skill Development modules**

**Any Five Experiments Should Be Done**

1. To study different types of transmission media.
2. To study the serial interface using rs-232.
3. To study LAN using star topology
4. To study LAN using bus topology
5. To study LAN using tree topology
6. To study configure modem of computer
7. To study configure hub/switch
8. Analog to digital conversion
9. Digital to analog conversion

## CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 | PSO3 | PSO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 2 | 2 | 3 | 1 | - | - | 1 | 3 | 3 | 2 | 2 |
| CO2 | 2 | 2 | 2 | 3 | 2 | 2 | 3 | - | - | 2 | 2 | 2 | 2 | 3 |
| CO3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | - | - | 2 | 2 | 2 | 2 | 2 |
| CO4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | - | - | 1 | 2 | 3 | 2 | 3 |
| **Avg.** | | | | | | | | | | | | | | |

# LIST OF EXAMINERS / PAPER SETTERS IN ELECTRONICS

# 2023 – 24

| S. No. | Name of the examiner | Subject | Name of the College |
|---|---|---|---|
| 1 | Ch. Kanakarao 9848943943 | Electronics | Y.N. College, Narsapur |
| 2. | S. Venkata Raju 9246678554 | Electronics | D.N.R.College, Bhimavaram, W.G.Dist. |
| 3. | Dr. Y.V.Apparao | Electronics | S.V.K.P. & Dr.K.S.Raju College of Arts & Science, Penugonda, West Godavari dist. |
| 4. | Dr. P.L.Rambabu | Electronics | A.V.N.College, Visakhapatnam |
| 5 | K. Ramesh | Electronics | C.R.R. College (M) Eluru |
| 6 | K.B.S. Gopal | Electronics | C.R.R. College (M) Eluru |
| 7 | P.P. Divakar | Electronics | C.R.R. College (M) Eluru |
| 8 | V. Venkateswararao | Electronics | C.R.R. College (M) Eluru |
| 9 | A. Veera Bhadra Rao | Electronics | C.R.R. College (M) Eluru |
| 10 | L.S.R.Ch.V.K.Nageswararao | Electronics | C.R.R. College (M) Eluru |
| 11 | K.S.Ch.Srinivasa Rao | Electronics | C.R.R. College (M) Eluru |
| 12 | G.Vijayalakshmi | Electronics | C.R.R. College (M) Eluru |
| 13 | K. Ravikumar | Electronics | C.R.R. College (M) Eluru |
| 14 | A.Srinivasa Rao | Electronics | K.G.R.L.College , Bhimavaram |
| 15 | S.Srinivas | Electronics | K.G.R.L.College , Bhimavaram |
| 16 | Y.Sri Devi | Electronics | C.R.R. College (W), Eluru |
| 17 | S.V.Kumara Sastry | Electronics | S.K.B.R.College, Amalapuram |
| 18 | V.Radha Krishna | Electronics | S.K.B.R.College, Amalapuram |
| 19 | Esub Basha Sheik | Electronics | GC (A), Rajamahendravaram |
| 20 | E. Nageswara rao | Electronics | GDC (M), Nidadavole |
| 21 | Dr. P.V.S.S.S.N. Reddy | Electronics | GC (A), Rajamahendravaram |
| 22 | V. Ratna Sekhar | Electronics | D.N.R. College (A), Bhimavaram |
| 23 | K.H.R. Singh | Electronics | D.N.R. College (A), Bhimavaram |
| 24 | D. Ganga dharudu | Electronics | M.R. College, Peddapuram |
| 25 | A.Satya narayana Murthy | Electronics | M.R. College, Peddapuram |
| 26 | K. Venkateswarlu, HOD | Electronics | Y.N.College, Narsapur |

# Action Plan - 2023-24

The department of Physics and Electronics is planning to conduct the following programs for theacademic year 2023-24

| S.No. | Activity | Probable date to be conducted | Remarks |
|---|---|---|---|
| 1 | Student Counseling<br>Discussion on Result<br>Analysis | Sept 3rd week | |
| 2 | Sensitization on Departmental Activities particularly<br>on Kasarabada Scholarship and Endowment Prizes | Oct 2th week | |
| 3 | **Parent -Teacher meeting** | Nov 1st week | |
| 4 | Disbursement of Kasarabada Scholarship both for UG and PG | Nov 2nd week | |
| 5 | Celebration of Birth day of Sir C.V.Raman | 7.11.2023 | |
| 6 | Guest Lecture -1 | Nov3rdweek | |
| 7 | Launching Upkar Scheme | Nov4thweek | |
| 8 | Extension activity –<br>**Open Lab for School students** | Dec 2nd week | |
| 9 | Awareness programme on IMD | Dec3rd week | |
| 10 | Guest Lecture -2 | Jan 3rd week | |
| 11 | Study Area Programme/ CSP | Jan4th week | |
| 12 | Workshop / Intercollegiate Science Competitions | February 2nd week | |
| 13 | **National Science day celebrations** | **28.02.2024** | |
| 14 | Student Counseling before commencement of semester end exams | Feb 4th week | |

| | | | |
|---|---|---|---|
| 15 | Guest Lecture - 3 | Mar 2nd week | |
| 16 | Parent Teacher Meeting | April 1st week | |
| 17 | Online Quiz programme | May 1st week | |
| 18 | Field visit | Jun 2nd week | |
| 19 | Guest Lecture - 4 | July 1st week | |
| 20 | Observing World Chess Day | 20.07.2023 | |
| 21 | Parent Teacher Meeting | Aug 1stweek | |
| 22 | Observing Hiroshima/ Nagasaki Day | 6.8.2023/ 9.08.2023 | |
| 23 | UPKAR scheme – Disbursement of scholarships to the students | August 3rd week | |
| 24 | Observing World Ozone Day | 16.09.2023 | |

## P. R. GOVERNMENT COLLEGE (A), KAKINADA

## Department of Physics & Electronics

## Budget Proposal for the Academic Year 2023-24

| S. No. | PURPOSE | EXPENDITURE ESTIMATED | REMARKS |
|---|---|---|---|
| 1. | Upgradation of 1st year Lab | Rs. 50,000=00 | |
| 2. | Upgradation of 2nd year Lab and dark room | Rs. 50,000=00 | |
| 3. | Upgradation of final year Lab | Rs. 50,000=00 | |
| 4. | Requirement of Lab Equipment for V-SEM papers | Rs. 1,00,000=00 | |
| 5. ` | Research Materials and Characterization Devices for Research lab | Rs. 3,00,000=00 | |
| 6. | Student projects/Educational Tour | Rs. 1,00,000=00 | |
| 7. | National level Activity | Rs. 2,00,000=00 | |
| 8. | Departmental Activities@ National Sc.Day, Guest Lectures, Intercollegiate competitions | Rs.1,00,000=00 | |
| 9. | Miscellaneous@ Stationery, Maintenance of Laboratories etc. | Rs. 50,000=00 | |
| | TOTAL: | Rs. 10,00,000 | |

Budget estimated is Rupees Ten Lakhs only

# ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION

**Assessment methodology for Internships / On the Job Training / Apprenticeship under the revised CBCS (2020 – 21 onwards)**

## First internship (After 1st year examinations): Community Service Project

To inculcate social responsibility and compassionate commitment among the students, the summer vacation in the intervening 1st and 2nd years of study shall be for Community Service Project.

**Learning outcomes:**

- To facilitate an understanding of the issues that confronts the vulnerable /marginalized sections of the society.
- To initiate team processes with the student groups for societal change.
- To provide students an opportunity to familiarize themselves with urban / rural community they live in.
- To enable students to engage in the development of the community.
- To plan activities based on the focused groups.
- To know the ways of transforming the society through systematic programme implementation.

### Assessment Model:

There will be only internal evaluation for this internship. Each faculty member is to be assigned with 10 t0 15 students depending upon availability of the faculty members. The faculty member will act as a faculty-mentor for the group and is in-charge for the learning activities of the students and also for the comprehensive and continuous assessment of the students.

The assessment is to be conducted for 100 marks. The number of credits assigned is 4. Later as per the present practice the marks are converted into grades and grade points to include finally in the SGPA and CGPA.

Each student is required to maintain an individual logbook, where he/she is supposed to record day to day activities. The project log is assessed on an individual basis, thus allowing for individual members within groups to be assessed this way. The assessment will take into consideration the individual student's involvementin the assigned work.

While grading the student's performance, using the student's project log, the following should be taken into account -

a. The individual student's effort and commitment.
b. The originality and quality of the work produced by the individual student.
c. The student's integration and co-operation with the work assigned.
d. The completeness of the logbook.

The assessment for the ***Community Service Project implementation*** shall include the following components and based on the entries of Project Log and Project Report:

a. Orientation to the community development
b. Conducting a baseline assessment of development needs
c. Number and Quality of Awareness Programmes organised on beneficiary programmes and improvement in quality of life, environment and social consciousness, motivation and leadership, personality development, etc.
d. Number Quality and Duration of Intervention/service Programmes (Prevention or promotion programs that aim to promote behavioural change in defined community contexts to address social problems) organised.
e. Follow up Programmes suggested (Referral Services, Bringing Community Participation)
f. Developing short and mid-term action plans in consultation with local leadership and local government officers.

The **Project Report** should contain

a) Introduction, scope, objectives, and methodology
b) Project specifications (area / background of the work assigned).
c) Problems identified.
d) Analyses of the problems
e) Community awareness programmes conducted w.r.t the problems and their outcomes.
f) Intervention/service programmes taken up
g) Short-term and long term action plan for implementation
h) Recommendations and conclusions.
i) References

The **Project Presentation** is to be made by the student after he/she reports back to theCollege. The components for assessment are –

a. assessing the involvement in the project
b. presentation skills
c. final outcome of the project as evinced by the student.

For Example:

## II MPC-EM

| S.No. | Name of the Student | Class & Year of Study | Register Number | ProjectLog | Project Implementation | Project Report | Presentation | Total |
|---|---|---|---|---|---|---|---|---|
| | | | | (20) | (30) | (25) | (25) | (100) |
| | | | | | | | | |
| | | | | | | | | |

**Signature of Project Mentor** **Signature of Nominated faculty** **Signature of HOD/ In-Charge**

**ANDHRA PRADESH STATE**
**COUNCIL OF HIGHEREDUCATION**

**Assessment methodology for Internships / On the Job Training / Apprenticeship under the revised CBCS (2020 – 21 onwards)**

# Second Internship (After 2nd year examinations): Apprenticeship / Internship / On the job training / In-house Project / Off-site Project

To make the students employable, an Apprenticeship / Internship / On the job training / In-house Project / Off-site Project shall be undertaken by the students in the intervening summer vacation between the 2nd and 3rd years.

## Learning outcomes

- Explore career alternatives prior to graduation.
- Integrate theory and practice.
- Assess interests and abilities in their field of study.
- Learn to appreciate work and its function towards future .
- Develop work habits and attitudes necessary for job success.
- Develop communication, interpersonal and other critical skills in the future job.
- Build a record of work experience.
- Acquire employment contacts leading directly to a full-time job following graduation from college.
- Acquire additional skills required for world of work.

# Assessment Model

There will be only internal evaluation for this internship. Each faculty member is to be assigned with 10 t0 15 students depending upon availability of the faculty members. The faculty member will act as a faculty-mentor for the group and is in- charge for the learning activities of the students and also for the comprehensive and continuous assessment of the students.

The assessment is to be conducted for 100 marks and the credits assigned are 4. Later as per the present practice the marks are converted into grades and grade points to include finally

in the SGPA and CGPA.

| The weightings shall be: | |
|---|---|
| Project Log | 20% |
| Project Implementation | 30% |
| Project report | 25%, |
| Presentation | 25% |

Each student is required to maintain an individual logbook, where he/she is supposed to record day to day activities. The project log is assessed on an individual basis, thus allowing for individual members within groups to be assessed this way. The assessment will take into consideration the individual student's involvement in the assigned work.

While grading the student's performance, using the student's project log, the following should be taken into account -

a. The individual student's effort and commitment.
b. The originality and quality of the work produced by the individual student.
c. The student's integration and co-operation with the work assigned.
d. The completeness of the logbook.

The assessment for Project Implementation during ***second internship / Project Work / On the Job Training / Apprenticeship*** shall include the following components and based on the entries of Project Log and Project Report:

a. Involvement in the work assigned
b. Regularity in the work assigned
c. New knowledge acquired
d. New skill acquired

The Project Report should contain

a. Introduction.
b. Project specifications (area / background of the work assigned).
c. Problems taken up.
d. Analysis of the problem.
e. Recommendations and conclusions.

The Project Presentation is to be made by the student after he/she reports back to the College. The components for assessment are –

a. assessing the involvement in the project
b. presentation skills
c. final outcome of the project as evinced by the student.

For Example:

## II MPC-EM

| S.No. | Name of the Student | Class & Year of Study | Register Number | ProjectLog | Project Implementation | Project Report | Presentation | Total |
|---|---|---|---|---|---|---|---|---|
| | | | | (20) | (30) | (25) | (25) | (100) |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

**Signature of Project Mentor** **Signature of Nominated faculty** **Signature of HOD/ In-Charge**

# ANDHRA PRADESH STATE COUNCIL OF HIGHEREDUCATION

## Assessment methodology for Internships / On the Job Training / Apprenticeship under the revised CBCS (2020 – 21 onwards)

### Third internship/Apprenticeship (5th/6th Semester period):

During the entire 5th /6th Semester, the student shall undergo Apprenticeship / Internship / On the Job Training. This is to ensure that the students develop hands on technical skills which will be of great help in facing the world of work.

## Learning outcomes

- Explore career alternatives prior to graduation.
- Integrate theory and practice.
- Assess interests and abilities in their field of study.
- Learn to appreciate work and its function towards future .
- Develop work habits and attitudes necessary for job success.
- Develop communication, interpersonal and other critical skills in the future job.
- Build a record of work experience.
- Acquire employment contacts leading directly to a full-time job following graduation from college.
- Acquire additional skills required for world of work.

## Assessment model for the semester long apprenticeship / on the job training /internships during the V/VI Semester:

The assessment for the V / VI Semester long apprenticeship is for 200 marks and credits assigned are 12.

A monthly report is to be submitted to the teacher guide online within 15 days after the completion of the every month upto four months. The last two months of internship period shall be used for preparation of final project report simultaneously undergoing on the job training / internship / apprenticeship.

The assessment for this internship / on the job training will be both internal and external

assessment. The internal assessment will be for 25% of marks which will be continuous and the assessment by the industry / enterprise / organization where the student does his/her internship will be indicated in grades. This assessment is to be conducted by a responsible person (General Manager / HR Manager / Head of the Division) in consultation with the supervisor under whom the internship was done.

The components of internal assessment during *this* ***third internship / Project Work / On the Job Training / Apprenticeship*** shall include the following components and based on the entries of Project Log and Project Report:

a. Involvement in the work assigned
b. Regularity in the work assigned
c. New knowledge acquired
d. New skill acquired

The Project Report should contain

a. Introduction.
b. Project specifications (area / background of the work assigned).
c. Problems taken up.
d. Analysis of the problem.
e. Recommendations and conclusions.

The Project Presentation is to be made by the student after he/she reports back to theCollege. The components for assessment are –

a. assessing the involvement in the project
b. presentation skills
c. final outcome of the project as evinced by the student.

There shall be a final evaluation committee comprising of Principal, Teacher Guide, Internal Expert and External Expert nominated by the affiliating University. The final evaluation committee shall consider the following for evaluation –

A. Monthly Reports submitted by the student

B. Final Project Report

C. Grading given by the Company / Business unit / Enterprise where the student has undergone the training. The grades shall be converted into marks on the scale followed by the University.

To evaluate and award marks, the Committee conducts viva voce examination at the college.

Example:

| Name of the Student: | |
|---|---|
| Class & Year of Study | |
| Registered Number | |
| **Internal Assessment Component** | **Max. Marks** |
| 1. Project Log | 10 |
| 2. Project Implementation | 20 |
| 3. Project Report | 10 |
| 4. Presentation | 10 |
| **TOTAL** | **50** |
| **External Assessment Component** | **Max. Marks** |
| Performance Assessment by the Evaluation Committee, converting the grades awarded by the industry, enterprise, etc. | **100** |
| External Viva Voce | **50** |
| **GRAND TOTAL** | **200** |

**Pithapur Rajah's Government College (A),Kakinada**
**Department of Physics & Electronics**
**Subject: Electronics**

It is resolved to introduce the following new courses in the programmes in Department of Physics & Electronics, from the AY 2023-24

| S.No | Course Code | Title of the new course | Programmes in which it is introduced |
|---|---|---|---|
| 1 | | Fundamental of Electricity and Electronics | Electronics Minor for I year |
| 2 | | Fundamental of Electricity and Electronics Practicals | |

## Certificate

The syllabus and model question papers including **Blue – Print** in Electronics subject for 3 years B.Sc. course for the semester I,II,III,IV,V and VI for the academic year **2023-24**, list of examiners and paper setters, departmental activities which contains pages is approved in the Board of Studies meeting held offline and on line through the Google Meet app on **31 –08- 2023**

| | Members of Board of Studies | | Signatures of members |
|---|---|---|---|
| 1 | Smt.M.Surekha | Chairman | |
| 2 | Dr.P.Paul Diwakar | University nominee, Y.V.N.R Government college,Kaikaluru | |
| 3 | Dr.K.Jyothi | Subject Expert, Principal SVRKGDC(M),Nidadavolu | |
| 4 | Sri.B.Gangadharudu | Subject Expert, Lecturer in Electronics, MR government college | |
| 5 | Sri.B.Sudarshan | Representative from Industry, Andhra Electronics, Kakinada | |
| 6 | Dr.K.Nanda Gopal | Sr.Scientific Asst.IMD,Alumni | |
| 7 | Dr.K.Jayadev | Member | |
| 8 | Ms G. Sridevi | Member | |
| 9 | Smt.A.Padmavathi | Member | |
| 10 | Dr S V G V A Prasad | Member | |
| 11 | Dr.P.Himakar | Member | |
| 12 | Sri K. Durga Rao | Member | |
| 13 | Ms.V.Sireesha | Member | |
| 14 | N.Mahalakshmi | Student Member-II MPE | |
| 15 | G.Asha latha | Student Member-II MPE | |

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
KAKINADA 533 001-ANDHRA PRADESH
*An AUTONOMOUS and NAAC Accredited Institution* (A Grade- 3.17 CGPA)
(Affiliated to ADI KAVI NANNAYA UNIVERSITY, Rajamahendravarm.)

# ACADEMIC CELL

(Certificate to be issued by the University Nomine/Subject Expert/Member of BOS)

Department Name: physics & Electronics

Name of the BOS Member : Dr. P. Paul Diwakar
(UniversityNomine/Subject Expert/Industrilist/ Member)

I certify that the syllabus submitted by the Electronics Department is verified by me and I recommend the following suggestions:

1. 1. CIA – Reduce 2M to Assignment – Add 2M for Moocs Course.
2. [Assignment 5M = 3M Assignment + 2M for Moocs)
3. 2. Multidisciplinary Course has to be introduced in
4. 1st sem
5. 3. New Certificate Course has to be incorporated.
   like Refrigeration

The syllabus is approved with the above suggested modification

Signature with Date 31.8.23

Note: BOS Members are requested to fill the above details with necessary suggestions and send back to the Head of the department along with the syllabus

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
KAKINADA 533 001-ANDHRA PRADESH
*An AUTONOMOUS and NAAC Accredited Institution (A Grade- 3.17 CGPA)*
(Affiliated to ADI KAVI NANNAYA UNIVERSITY, Rajamahendravaram.)

# ACADEMIC CELL

(Certificate to be issued by the University Nomine/Subject Expert/Member of BOS)

Department Name: physics & Electronics

Name of the BOS Member : D. Gangadharudu D. GANGADHARUDU
(UniversityNomine/Subject Expert/Industrilist/ Member)

I certify that the syllabus submitted by the Electronics Department is verified by me and I recommend the following suggestions:

1. Give importance to MOOCS and Swayam courses in Internal system.
2. Implement refrigiration repair as Add on course to III Degree
3. Electronics students.
4.
5.

The syllabus is approved with the above suggested modification

Signature with Date
31/8/23.

Note: BOS Members are requested to fill the above details with necessary suggestions and send back to the Head of the department along with the syllabus