College Profile, Academic Regulations, Scheme and Syllabus (1st year)

(Common to all Branches)

(With effect from 2017-2018 Academic year)

Bachelor Degree in Engineering

Out Come Based Education

with

Choice Based Credit System

P.E.S. College of Engineering, Mandya - 571 401, Karnataka

(An Autonomous Institution Affiliated to VTU, Belagavi)

Grant -in- Aid Institution(Government of Karnataka)

World Bank Funded College (TEQIP), Accredited by NBA, New Delhi, Approved by AICTE, New Delhi.

ಪಿ.ಇ.ಎಸ್. ತಾಂತ್ರಿಕ ಮಹಾವಿದ್ಯಾಲಯ

ಮಂಡ್ಯ–571 401, ಕರ್ನಾಟಕ

(ವಿ.ಟಿ.ಯು., ಬೆಳಗಾವಿ ಅಡಿಯಲ್ಲಿನ ಸ್ವಾಯತ್ತ ಸಂಸ್ಥೆ)

Phone : +91-8232- 220043/238042/220120/238330/238683

Fax : 08232 – 222075

e-mail : principal@pesce.ac.in; Web : www.pescemandya.org, www.pesce.ac.in

College Profile, Academic Regulations, Scheme and Syllabus (1st year)

(Common to all Branches)

(With effect from 2017-2018 Academic year)

Bachelor Degree in Engineering

Out Come Based Education

with

Choice Based Credit System

P.E.S. College of Engineering, Mandya - 571 401, Karnataka

(An Autonomous Institution Affiliated to VTU, Belagavi)

Grant -in- Aid Institution(Government of Karnataka)

World Bank Funded College (TEQIP), Accredited by NBA, New Delhi, Approved by AICTE, New Delhi.

ಪಿ.ಇ.ಎಸ್. ತಾಂತ್ರಿಕ ಮಹಾವಿದ್ಯಾಲಯ

ಮಂಡ್ಯ–571 401, ಕರ್ನಾಟಕ

(ವಿ.ಟಿ.ಯು, ಬೆಳಗಾವಿ ಅಡಿಯಲ್ಲಿನ ಸ್ವಾಯತ್ತ ಸಂಸ್ಥೆ)

Ph : 08232- 220043, Fax : 08232 – 222075

Web :www.pescemandya.org

P.E.S. COLLEGE OF ENGINEERING, MANDYA-571 401

(An Autonomous Institution Affiliated to Visvesvaraya Technological University, Belagavi)
World Bank Funded College (TEQIP)
Aided by the Govt. of Karnataka
Accredited by National Board of Accreditation, New Delhi
Recognized by AICTE, New Delhi

Contact:

Ph. No. – 08232-220043, 238683, 238042
Fax No.- 08232-222075
Email ID – principal@pesce.ac.in
Website :http://pescemandya.org
http://pesce.ac.in

VISION

"PESCE shall be a leading institution imparting quality Engineering and Management education developing creative and socially responsible professionals."

MISSION

- Provide state of the art infrastructure, motivate the faculty to be proficient in their field of specialization and adopt best teaching-learning practices.
- Impart engineering and managerial skills through competent and committed faculty using outcome based educational curriculum.
- Inculcate professional ethics, leadership qualities and entrepreneurial skills to meet the societal needs.
- Promote research, product development and industry-institution interaction.

Quality Policy

Highly committed in providing quality, concurrent technical education and continuously striving to meet expectations of stake holders.

Core values

Professionalism
Empathy
Synergy
Commitment
Ethics

Principal Message

Since its inception in 1962, the PES College of Engineering, Mandya has established itself as a Premier Engineering Institution in Karnataka. It is engaged in imparting quality technological education and providing support to technical education and research activities. PESCE has committed to enhance capabilities and potential of our human resources with the objective of transforming them into leaders in their chosen area of interest. Our vision is to provide excellent technical education for the students, be globally competitive, so that out students can continuously contribute to a global and rapid technological revolution. PESCE has carved a niche for itself among the best engineering colleges in India and is a dream institute for many budding engineers. Our distinguished alumni occupied coveted positions both in India and abroad and a rare source of pride and inspiration to us.

I am confident that with the concerted efforts of management, faculty, staff and students, PESCE will scale new heights of excellence in the years to come.

Dr.V. Sridhar
Principal

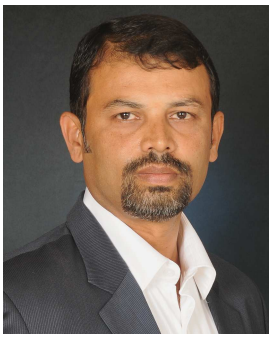
Vice Principal Message

PESCE, since from its inception, providing quality engineering Education to both rural and urban aspirants. The institution has, high class infrastructure with well equipped Laboratories, Class Rooms, Library, well equipped Placement and Training centre, Auditorium, Sports complex, independent Hostels for boys and girls, transportation facilities, medical help and a beautiful greenery campus. We are proud of strong team of meticulously trained, dedicated and committed faculty and staff with most advanced teaching aids.

As we strive for excellence in what we do, the Institute is constantly making endeavors to scale new heights by developing synergy between academic knowledge, technical skill set in line with industry needs, high moral values and sensitivity to the environment, society and the nation. Therefore, apart from academics, co-curricular activities, sports and cultural development will form an integral part of the life at PESCE from the very beginning of their career.

I am confident that with the concerted efforts of management, faculty, staff and students, PESCE will scale new heights of excellence in the years to come. With this I invite you to PESCE to experience the difference.

Dr. H. V. Ravindra
Vice Principal



Sri.B.DineshPrabhu

Preface

Dr.P S Puttaswamy

This document gives a brief insight about Profile of our College, Academic Regulations of the Autonomous System of the college, Scheme of teaching and examination with effect from 2017-2018 Academic year and 1st year Syllabus which is Common to all branches of Engineering.

PES College of Engineering, Mandya, started in the year 1962, has become autonomous institute in the academic year 2008-09. Since, then it has been doing the academics and assessment activities successfully. The college is running Eight undergraduate and Eight Postgraduate programs including MBA and MCA which are affiliated to VTU, Belagavi.

India has recently become a Permanent Member of the Washington Accord. The accord was signed by the National Board of Accreditation (NBA) on behalf of India on 13th June 2014. It enables not only the mobility of our degree globally but also establishes equivalence to our degrees with that of the member nations. The implementation of Outcome Based Education (OBE) has been the core issue for enabling the equivalence and of Indian degrees and their mobility across the various countries.

Our Higher Educational Institution has adopted the Choice Based Credit System (CBCS) based semester structure with OBE scheme and grading system. Which provides the flexibility in designing curriculum and assigning credits based on the course content and hours of teaching. There lies a shift in thinking, teaching and learning process moving towards Students Centric from Teachers Centric education which enhances the knowledge, skills & moral values of each student.

Choice Based Credit System (CBCS) provides the options for the students to select from the number of prescribed courses. The CBCS provides a 'cafeteria' type approach in which the students can Choose electives from a wide range of courses of their choice, learn at their own pace, undergo additional courses and acquire more than the required credits, adopt an interdisciplinary approach for learning which enables integration of concepts, theories, techniques. These are greatly enhances the skill/employability of students.

In order to increase the Industry/Corporate readiness, many Soft Skills, self learning components and Personality Development modules have been added to the existing curriculum. In order to enhance creativity and innovation Mini Project and Industrial visit & Interaction are made mandatory for all undergraduate programs.

Sri B.DineshPrabhu
Deputy Dean (Academic)
Associate Professor,
Dept. of Automobile Engg.

Dr. P S Puttaswamy
Dean (Academic)
Professor,
Dept. of Electrical &ElectronicsEngg.

Contents

Sl. No.	Particulars	Page No.
1.	***College Profile***	
	About P.E.S. College of Engineering, Mandya	1
	List of Governing Council Members	3
	Infrastructure	4
	Introduction to Autonomous System	7
	PESCE Training & Placement Centre (TPC)	11
	Research at PESCE	13
	Centres of Excellence	15
	Tie-ups with Foreign Universities	16
	Industry Institute Interaction activities	17
2.	***Regulations Governing Bachelor of Engineering Program***	
	General	20
	Degree programs	20
	Admission	21
	Course structure	21
	Registration	23
	Attendance requirement	24
	Withdrawal from the course	24
	Change of branch and institution	25
	Evaluation system	25
	Degree requirements	28
	Termination from the programme	29
	Graduation requirements	29
	Award of prizes, medals & ranks	29
	Conduct and discipline	29
3.	***Scheme of Teaching and Examination***	31
4.	***Syllabus***	
	Engineering Mathematics-I	39
	Engineering Physics	41
	Engineering Chemistry	45
	Engineering Mechanics	49
	Computer Concepts & C Programming	51
	Elements of Mechanical Engineering	52
	Computer Aided Engineering Drawing	54
	Basic Electrical Engineering	55
	Basic Electronics	57
	Basic Mechanical Engineering Science Lab	59
	C Programming Lab	61
	Engineering Physics Lab	62
	Engineering Chemistry Lab	64
	Effective Communication Development. (ECD)	66
	* Indian Constitution, Human Rights & Professional Ethics (ICHRPE)	67
	*Environmental Studies	68
	* Language (Kannada Kali)	69
	Engineering Mathematics-II	70
	Professional Communication Development(PCD)	72
5.	***I – Semester B.E. Time - Table for the Year : 2016 - 17***	74
6.	***Academic calendar of odd semester 2017-18***	76

Dr. H.D.Chowdaiah

College Profile

Sri K.V. Shankaragowda

P.E.S. College of Engineering, Mandya was started in the year 1962 by People's Education Society ®, Mandya under the leadership of late Sri K.V.Shankaragowda. The college is permanently affiliated to Visveswaraya Technological University (VTU), Belagavi, and has obtained Autonomous status in the year 2008-09 by the UGC. It is recognized by All India Council for Technical Education (AICTE), New Delhi and accredited by National Board of Accreditation (NBA). The college is functioning under the Grant-in-aid code, Government of Karnataka. The college is beneficiary of TEQIP grant under component 1.1. The college is now managed by Peoples Education Trust ®, Mandya and is led by SahakariRathna Dr. H.D.Chowdaiah, Ex MLC, MLA, as a Chairman. Also it provides Excellent academic environment, sports complex and other amenities which are spread across 62 acres of beautiful lush green campus. The college is running eight Undergraduate BE programs and eight Postgraduate programs. It consists of six M.Tech programs, MBA and MCA which are affiliated to Visvesvarya Technological University. The total intake of the college is 620 students for UG course and 146 students for PG course, besides more than hundred research scholars pursuing their MSc (Engg) & PhD research programs.

After obtaining the Autonomous status the Management has redefined its vision and mission "it is committed to develop student potential through high quality teaching – learning processes and state of the art infrastructure" and is determined to improve the academic standards and campus environment to impart Quality Technical education. As per the Washington Accord, we have revised our curriculum to adopt the Outcome Based Education (OBE).Further, Choice Based Credit System along with Out Come Based Education is adopted since 2015-16.Institutional Strategic Development Plan has been approved by Board of Governors for the year 2014 to 2020 to make students of PESCE as Professionally Excellent, Socially Committed Engineers in Synonym to PESCE. The TEQIP funds have been utilized effectively and all the Departments have procured latest equipments to their laboratory to train students with the latest equipment as per industry standard.

To cater, the needs of the students, pertaining to Mechanical, Automobile and Industrial Production Engg. departments, new Computer Aided Design lab has been added to the infrastructure. The college campus computer network has been upgraded and entire campus is provided with Wi-Fi to access internet. In order to update the knowledge of the faculty and technical staffs with the latest technology, the faculty members and teaching staff are regularly deputed for the Faculty Development Programs (FDP) and technical trainings.

The FDP programs are regularly conducted in house by inviting experts from industries and reputed institutions. Teaching Assistant ships are provided to M.Tech students.

Our college has got distinction of having research centre in all the Engineering Departments recognized by the Visvesvaraya Technological University, Belagavi and also has got a PET Research Foundation which is being recognized by University of Mysore and Kuvempu University, Shimoga. There are 46 PESCE faculty members (Ph.D guides) who are guiding more than 120 research students for PhD in various disciplines and every year our college produces, on an average, 6 to 7 Ph.D scholars in various disciplines.

The academic activities of the college is governed by a higher body called Academic Council and the Dean (Academics) which is in charge of the academic activities of the college. The curriculum is being upgraded regularly to make our students to cope up with the day to day technological development. The Examination and Evaluations were carried out independently and the results are published as per the Visvesvaraya Technological University norms. The Controller of Examination (CoE) is the head of the Examination cell. The Autonomous Examination system in our college is well managed and earned good name in the state.

Management:

The PESCE is run by Peoples Education Trust® (PET), which was formed by philanthropic farmers of Mandya District, on a 'no profit' basis. It is committed to the society and focused on providing quality education to the students of rural background. The PET has got nine institutions starting from High school to Degree level in Mandya city. The Chairman of the Trust is Dr.H.D.Chowdaiah, Ex. M.L.A and Ex. M.L.C of Karnataka. The PESCE Governing Council (GC) consists of members from good academic excellence like Dr M. S. Shivakumar , Former Registrar VTU & Former principal and Professor, Dept of CSE, NIE, Mysuru, VTU Nominee, Dr. H.V. Venkatakrishna, retired Professor, NITK, Surathkal, Dr. Ramaswamy, retired Professor, Anna University, Chennai and Dr. K P Singh, . The management is committed to fulfilling and exceeding the AICTE norms and has got the dream to build the institution to the level of international standard in technical education.

PET Group of Institutions

◊PES College of Engineering , 1962
◊PES College of Science , 1966
◊PES Evening College, 1969
◊Shankaragowda College of Education (B.Ed.), 1973
◊PES Law College, 1986
◊PES High School, 1988
◊PES PU College, 2002

LIST OF GOVERNING COUNCIL MEMBERS

Sl.No.	Name of Member with Address	Designation
1	Dr.H.D. Chowdaiah, B.Sc. (Agri) Ex. M.L.A & Ex. M.L.C Holalu Village, Mandya	Chairman
2	Sri H. Honnappa, Ex. M.L.C Induvalu Village, KothathiHobli, Mandya Tq.	Member
3	Sri A.M. Chandramohan, S/o Late P.Mallaiah, 2nd Cross, Subhash Nagar, Mandya	Member
4	Sri Basavaiah, Vice President PET®, Advocate, Mahilasamaja Road, Ashok Nagar, Mandya	Member
5	Sri S.L. Shivaprasad Trustee, PET®, 2nd Cross, Mathoshree, Bandhigowda Layout, Mandya	Member
6	The Director of Technical Education In Karnataka, Palace Road, Bangalore	Member
7	Regional Officer All India Council for Technical Education, S.W.R.O, Palace Road, Bangalore	Member
8	Dr. S.V. Ramaswamy Old No.37, New No. 87, 3rd Main Road, Gandhinagar, Adayar, Chennai – 600 020 Mob: +91 9840231961	AICTE Nominee
9	Prof. H.V. Venkatakrishna No.110, Shravanthi Orchids, 1st Main Road, Padmanabhanagar,Bangalore – 560 070	GOK Nominee
10	Dr.M.S.Shivakumar # 1270, Kamala 4th Cross, Paduvana Road, STK Layout, Kuvempunagar, Mysore – 570023.	VTU Nominee
11	Dr.K.P.Singh, A-620, Sector-46 Noida.	UGC Nominee
12	Dr.K.Narasimhachary COE & Professor Industrial & Production Engg. P.E.S.College of Engineering,Mandya.	Staff Representative
13	Principal P.E.S.College of Engineering, Mandya.	Principal & Ex-Officio Secretary, GC

Infrastructure:

The College perhaps has the best campus with state of art teaching facilities and environment for academic pursuit surrounded by lavish greenery on 65 acres land. It has spacious class rooms, well equipped labs and multimedia facilities to encourage students to make academic progression. The central library has around one lakh volumes of books and Journals hard copy 125, e-Books 112000, e-Journals 32712, digital library, video lectures on advanced topics and numerous on-line subscriptions of International Journals. Each department has a separate building with well-maintained laboratories having latest equipments which cater to the practical needs of the student. The internet and intranet facilities with Wi-Fi networking encourage one to be explorative. These are more than 3000 students currently receiving quality technical education under the able guidance of 201 distinguished faculty members. The qualities, dedication and experience of the faculty are the highlights of this institute, where, 48 faculties holding Ph.D. degree and the remaining 149 are postgraduate degree holders. The average experience of the faculty is around 16 years. The teacher-student relationship makes the entire atmosphere more conducive for learning with activities such as coaching, guiding, counseling and mentoring. The facilities such as Canteen, Dispensary, Boys & Girls hostels, Bank and Co-operative stores make the stay at PESCE very comfortable.

Graduate Programs

Sl. No.	Program	Year of Starting	Present Intake
1.	Civil Engineering.	1962	120
2.	Mechanical Engineering	1962	120
3.	Electrical & Electronics Engineering	1962	40
4.	Electronics & Communication Engineering.	1971	120
5.	Automobile Engineering	1980	30
6.	Industrial & Production Engineering	1980	40
7.	Computer Science & Engineering	1983	120
8.	Information Science	2000	30
		Total Intake	620

Postgraduate Programs

Sl.No.	Program	Year of Starting	Present Intake
1.	M.Tech Computer Integrated Manufacturing	1999	18
2.	M.Tech Machine Design	2013	24
3.	M.Tech Computer Science & Engineering	2000	18
4.	M.Tech Computer Engineering	2012	24
5.	M.Tech CAD of structures	2002	18
6.	Master of Computer Applications	1992	60
7.	Master of Business Administrations	2009	60
8.	M.Tech VLSI Design & Embedded Systems	2012	24
		Total Intake	246

- **Student Strength: 620 UG, 246 PG, 134 Research Scholars**

Faculty Strength	**205**
Ph.D.	49
M.Tech. /ME/ M.Sc.	152
B.E./B.Tech.	4

Faculty & Student Ratio			
Sl. No	Department	Ratio	
		UG	PG
1.	Civil Engineering.	1:15	1:12
2.	Mechanical Engineering	1:15	1:12
3.	Electrical & Electronics Engineering	1:11	--
4.	Electronics & Communication Engineering.	1:15	1:18
5.	Automobile Engineering	1:11	--
6.	Industrial & Production Engineering	1:15	--
7.	Computer Science & Engineering	1:15	1:12
8.	Information Science	1:11	--
9.	Master of Computer Applications	--	1:16
10.	Master of Business Administrations	--	1:13

Library and information centre

The institution has a good central library housed adjacent to administrative block. The sections in the library are Circulation, Reference, reading room, Digital library, newspaper and magazine sections. This is provision on for one hundred students can study at a time in the library. Library has good collection which caters the educational needs of users.
The library collection is fully automated and books are barcoded and classified as per Dewey decimal classification also the book transaction is computerised.

Collections

The library has a collection of more than one lakh items including books, journals, magazines, standards, project reports and other materials in the field of technical and management sciences. Also separate digital library is equipped with collection of 2200 CDs and 24 computers for accessing e-resources.

Services and facilities

1. OPAC (online public access catalogue)is created for book searching.
2. IR is created for collecting, preserving, and disseminating digital copies of the intellectual output of an institution like journal article, conference papers, project reports, theses and question papers.
3. Digital library has 24 exclusive nodes connected to different servers hosting connection to a lot of e-resources including e-journals, e-books and other materials.
4. All the subscribed e-journals are made remotely accessible via Knimbus.
5. The reference section is serving the users with special collection like competitive examinations, dictionaries, handbooks, standards etc.
6. Magazine section cum reading room provides peaceful atmosphere to study inside the library.
7. Library is a member to VTU Consortium and availing access to 9 journal databases such as IEEE, Science Direct, Taylor and Francis, Springer, Proquest Management and Technology, ASME, ASCE and Knimbus.
8. Library is a member to NDL and access is provided to the same.
9. Access to SWAYAM is provided.

On-Campus Computing Facilities:

- Separate Multimedia CAED lab for 1st year students.
- Campus connectivity using Optical Fiber Networks.
- Wi-fi connectivity throughout the campus.
- 100 MBPS Internet connectivity
- Independent computer centers in all departments.
- College website http://www.pesce.ac.in and http://www.pescemandya.org

Centralized Sophisticated Instruments Facilities

- VLSI Design lab with CADANCE EDA Tools
- Total Station
- Atomic Absorption Spectra Photometer
- CNC Lathe and CNC Milling Machine
- Wire Electric Discharge Machine (WEDM)
- Machine Vision Image Processing Lab
- Partial Discharge Analyzer
- Shielded Chamber
- Computerized Wheel aligner
- Extrusion Honing machine
- Journal Bearing Test Rig
- Trust Bearing Test Rig
- Advanced Metrology Lab

Major Labs

- Computer Aided Engineering Drawing Lab
- Diagnostic Maintenance Lab
- CAD/CAM Lab
- High Voltage Testing Laboratory
- Internet & Wi-fi Browsing (with 100 MBPS)
- Computing Laboratories
- Networking Laboratory
- VLSI Lab
- Metrology Laboratory
- Tribology Lab
- Wind Tunnel Lab

Other Facilities

- Transport Facility
- Reprographics facility in all Departments
- Canteen facility
- Dispensary
- Purified soft Drinking water (RO) with cooler facilities are provided in all departments throughout the campus
- Back up and generator power supply provided to all departments.
- Solar water heaters in all the hostels
- Parking lot for two and four wheelers
- Cooperative Stores for Student benefit
- State Bank of India as campus bank
- State Bank ATM facility
- Smart class rooms
- Air-conditioned auditorium with ICT facility having 400 seating capacity

International standard sports complex.

- PET Cricket Stadium
- PET Aquatic Centre
- PET Indoor Stadium
- PET multi Gym. Centre
- Kho-kho court
- Basket Ball Court
- Volley Ball court
- PET Tennis Court
- PET Football/Hockey Stadium
- Multipurpose Stadium

Hostels Facilities

VSVM Boys hostel –off campus.

Situated 1km away from the campus and very close to central bus stand.
Number of rooms: 65 triple occupants and 5 quadruple occupants
Number of inmates: 215
Facilities: Free medical, Library, TV room, solar water heaters, Closed-circuit television (**CCTV**), separate Mess and bus conveyance to campus.

PESCE Boys Hostel

Situated inside the campus.
Number of rooms: 89 single, 21 double and 73 triple occupants
Number of inmates: 350
Facilities: Free medical, Library, TV room, Wi-Fi internet connectivity, Play ground and separate mess

PESCE Girls Hostel

Situated inside the campus.
Number of rooms: 67 double and 79 triple occupants
Number of inmates: 371
Facilities: Free Medical, Library, TV room, solar water heaters, Closed-circuit television (**CCTV**), Wi-Fi internet connectivity, Play ground and separate mess

Co-curricular Activities:

An active student chapter of many professional bodies such as ISTE, IEEE, SAE, IETE, Red Cross Society, GLUG, NEN and CSI is made available for the students to explore their hidden talents.

Introduction to Autonomous System:

The affiliating system of colleges was originally designed when their number in a university was small. The university could then effectively oversee the working of the colleges, act as an examining body and award degrees on their behalf. The system has now become unwieldy and it is becoming increasingly difficult for a university to attend to the varied needs of individual colleges. The colleges do not have the freedom to modernise their curricula or make them Industrial oriented.

The exercise of academic freedom by teachers is a crucial requirement for development of the intellectual climate of our country. Raising the quality of higher education is the joint responsibility of students, teachers and management and it is imperative that they share it equally. The safe and better way to improve the quality of undergraduate and postgraduate education is to delink colleges from the affiliating structure. It is targeted to make 10% of eligible colleges autonomous by the end of the 10^{th} Five Year Plan**.** Hence, the Education Commission (1964-66) recommended the college autonomy which is the instrument for promoting academic excellence.

Freedom of Autonomous colleges:

An autonomous college will have the freedom to:

- Determine and prescribe its own courses of study and syllabi, restructure and redesign the

courses to suit Industry needs.

- Evolve methods of assessment and performance of students, conduct of examinations and notification of results.
- Use modern tools of educational technology to achieve higher standards and greater creativity.
- Promote healthy practices such as community service based projects for the benefit of the society at large.

Role of the Parent University (VTU, Belagavi):

The role of the Parent University is to promote Autonomous System by bringing more autonomous colleges under its fold. The parent university will:

- Promote academic freedom in autonomous colleges by encouraging introduction of innovative academic programmes.
- Facilitate new courses of study, subject to the required minimum number of hours of instruction, content and standards.
- Permit them to issue their own provisional degree and other essential certificates.
- Ensure that degrees/diplomas/certificates issued indicate the name of the college.

The Academic Council will be solely responsible for all academic matters, such as, framing of academic policy, approval of courses, regulations and syllabi, etc. Dean (Academic) is the Member Secretary of Academic Council. The Council will involve faculty at all levels and also Academic Council consists of panel of experts drawn from academia of highest caliber from outside, including representatives of the university and the state government.

The BOS is the basic constituent of the academic system of an autonomous college. Its functions will include framing the syllabi for various courses, reviewing and updating syllabi from time to time, introducing new courses of study, determining details of continuous assessment, recommending panels of examiners under the semester system, etc.

Award of Degrees through Parent University:

The parent university will award degree to the students evaluated and recommended by autonomous colleges. The degree certificates will be in a common format devised by the university. The name of the college will be mentioned in the degree certificate, if so desired. Autonomous colleges that have completed three terms can confer the degree under their title with the seal of the university.

Autonomous System @ PESCE:

The Education Commission has recommended college autonomy which is the instrument for promoting academic excellence. There are only 10% of the eligible colleges were targeted to make autonomous at the end of 10^{th} Five Year Plan based on this PESCE, Mandya has become autonomous in the year 2008.

Autonomous colleges are free to make use of the expertise of University departments and other institutions to frame their curricula, devise methods of teaching, examination and evaluation. The parent university will accept the methodologies of teaching,

examination, evaluation and the course curriculum of its autonomous colleges. It will also help the colleges to develop their academic programmes, improve the faculty and to provide necessary guidance by participating in the deliberations of the different bodies of the colleges.

The Right of Autonomy may not be conferred once and for all. It has to be continuously earned by the college. The status of autonomy will be granted initially for a period of six years. The autonomous college with the approval of its Academic Council will formulate an appropriate mechanism to evaluate its academic performance, improvement of standards, and assess the extent and degree of success in the utilization of autonomy. In addition, there will be two external evaluations, the first after four years and the second after six years. The latter evaluation will determine the continuance or revocation of autonomous status.

The university will review the functioning of autonomy in an autonomous college at the end of the fourth year with the help of a committee constituted for the purpose. This committee may consist of one nominee of the UGC, one nominee of the parent university, one nominee of the State Council for Higher Education and two experts from outside the state to be nominated by the university.

Academic Cell:

The Academic Cell has been formed to supervise the academic affairs headed by the Dean (Academic), Principal and HODs of different departments. The cell regularly collect information related to academic needs, syllabus formation, course coverage, academic scheduling and time table etc. The main profile of the cell is to interact with university, examination cell as well as local governing bodies involved in academic proceedings.

Important activities of the academic cell are as follows:

- Preparing the academic calendar of UG and PG in consultation with COE office.
- Responsibility to constitute the BOS of all the departments, Academic senate and other Academic bodies.
- Responsibility of framing the syllabus time to time and look into the anomalies if any.
- Fixing the credits to various courses in consultation with COE
- To initiate the necessary formalities to introduce any new course required by the department.
- Interact with the COE as and when required to solve any problem related to credit system
- To supervise the academic standards and quality of the curriculum and inform the necessary board to take action if required.
- To interact with the DUGC, if necessary regarding academic issues.
- Getting Approval for Confer Degree to the students from the affiliated university.
- Making arrangements to award certificates to the students at the end of their degree.

Deputy Dean (Academic)
Sri.B.DineshPrabhu
Associate Professor,
Department of Automobile Engeering

Dean (Academic)
Dr. P S Puttaswamy
Professor
Dept. of Electrical & Electronics Engg.

Examination Cell

Sri.K.M .Ananthu

Dr.K.Narasimhachary

The Examination cell has been formed to supervise the examination & evaluation process which is headed by the COE. The conduct of examinations in the autonomous system is an important academic activity to bring out the student's performance. In this context, Examination Cell plays a key role in the evaluation process. At each and every stage in the evaluation process, including Continuous Internal Evaluation (CIE) and Semester End Examinations (SEE) and Make-up Examinations (MUP), COE along with Deputy Controller of Examinations (Dy. COE) meticulously monitor the performance of students by giving suitable guidelines to various departments in the institution from time to time.

Important activities of the examination cell are as follows:

- Overall conduction of examination (CIE, SEE, and MUP) process, this includes, scheduling the examination dates, to take necessary action to set the question papers from the examiners, printing the question papers (CIE of I & II semesters, SEE and MUP) and distribution.
- Announcement of the examination fee and other fees related to examination.
- To provide proper notification to the departments related to the examination process and conducting the examination time to time.
- Getting CIE marks from the departments from time to time also Monitors the CIE process and inform any irregularities to the Principal.
- Conduction of valuation work, processing the results, announcement of the results, issuing the grade cards and PDC.
- **Maintenance of confidentiality** of the examination system.
- Conduction of Malpractice committee meeting and issuing all notification related Malpractice.
- Strictly adhere to the university instruction regarding Autonomous Examinations.
- Coordinating with the Dean (Academic) to implement the autonomous discipline as per the UGC and VTU guidelines.

Deputy Controller of Examination
Sri.K.M .Ananthu
Associate Professor,
Dept. of Civil Engineering

Controller of Examination
Dr.K.Narasimhachary
Professor
Dept. of Industrial & Production Engg.

PESCE Training & Placement Centre (TPC)

PESCE Training & Placement Centre (**TPC**) is working towards inculcate values of perseverance and perfection in each student, to achieve professional and personal excellence. The **TPC** plays a very critical role in acclimatizing students to a corporate setting, which complements the academic skill-set for which they are taught. **The TPC** strives to bridge the gap between college and corporate culture, with the ultimate objective of producing industry-ready professionals.

The Students are exposed to thorough training in the **aptitude, verbal**, **technical and soft skills** segments, which play a pivotal role in not just the campus recruitment process, but in other competitive exams also. A "**Strategic"** Training Model, which is incorporated throughout the semester, ensures completion of syllabus within a week, followed by exhaustive assessments over the course of the term. This model will be employed for the first six semesters.

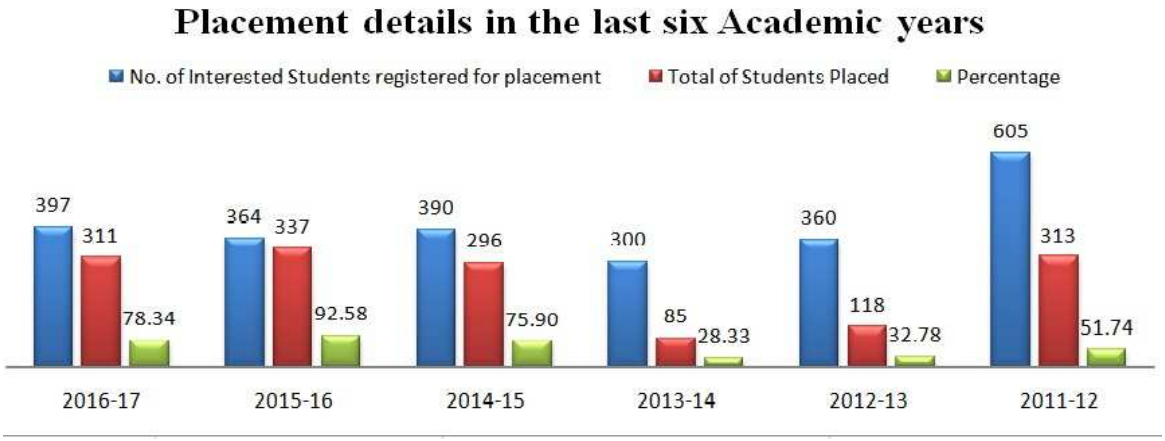
An intensive **"Vocational" placement** specific training programme is being conducted before and after **6**th semester. A "**Company-Specific"** training programme helps to equip the students for different recruitment processes, they face in the **7**th semester.

The above mentioned is better achieved by employing **conducive class** dynamics, where, the class is divided into groups after careful prior analysis, such that the acumen of every group is the same. A **score board** is maintained for each class to build a sense of healthy competition.

Students' performances are tracked after regular **topic-wise** assessments and analysis to find each student's area of improvement and hence further provide them with **follow-up** sessions. **Periodic counseling** is provided to the students by **certified counselors** to enhance their personality and presentation skills. The mix of personality and proficiency building helps to create individuals of substance with leadership quality, completely prepared for any kind of **professional** challenges.

Facilities at Training and Placement Cell

- Dedicated building for training and placement activities.
- Air Conditioned Auditorium for 400 audiences.
- Auditorium is multimedia enabled for an effective presentation.
- Training rooms to conduct both online and offline trainings.
- Board room to conduct meetings.
- Group discussion and Interview rooms.
- Dining hall.



Our Recruiters

Placement Activities

1. Throughout the year placement training is provided to our students by corporate professionals, alumnus from IIM, IIT and symbiosis
2. Training is provided to our students in aptitude, verbal, technical and soft skills segments, which play a pivotal role in the campus recruitment and also in other competitive exams.
3. Intensive vocational placement specific training program are conducted before and after 6th semester
4. During 7th semester students will undergo company specific training.
5. Periodic counseling is provided to the students by certified counselors to enhance their personality and presentation skills

Our Goal

Target for the coming years is to achieve above 90% placement

Sri.Anand M J

Research at PESCE

Dr. S L Ajit Prasad

The Institute currently offers M.Sc. (Engineering by Research), M.Sc. (Technology by Research) and Ph.D under PET research foundation with degrees affiliated to Visvesvaraya Technological University, University of Mysore and Kuvempu University. All the departments of the institute are recognized as research centers under VTU, whereas, E & E Dept. has additional recognition of Kuvempu University and departments of E&C, CS&E, Mathematics and Chemistry have additional recognition as research centers under University of Mysore for the research programmes. These are more than 138 students from industry and academia are enrolled With PET research foundation for Ph.D. programmes. The institute has produced 64 Ph.Ds. and 11 M.Sc. Engg. within a span of 8 years. The Research scholars and faculty members are involved in many research projects funded by UGC, DST, DRDO, AR&DB, VGST and AICTE.

Objectives

- Promote research within the Institute.
- Provide information of funding opportunities to support faculty research, and oversees systems and processes related to externally fund sponsored /consultancy project.
- Facilitates conferences and workshops held at the Institute.
- Promote Research and developmental activities

Recognition

- All departments are recognised as Research centre by VTU.
- University of Mysore has recognised PET Research centre for doing research in the field of Electronics, Computer Science, Mathematics, Science and Chemistry.
- Kuvempu University has recognised a few of the guides to carry out research in Electrical Engineering.

Ph.D Awardees (Branch Wise)

Branch	Number of awardees
Civil Engineering	13
Mechanical/Automobile/IP	13
Electrical/Electronics	28
CS/IS	12
Mathematics	04
Chemistry	01

Research Programs

M.Sc. (Engineering) by Research and Ph.D. under VT University, Belagavi

- Civil Engineering
- Mechanical Engineering
- Electrical and Electronics Engineering
- Electronics and Communication Engineering
- Automobile Engineering.
- Computer Science & Engineering
- Physics
- Chemistry
- Mathematics
- MBA
- MCA

PET Research Foundation

Program	Affiliated to
Electronics & Communication Engg. Computer Science & Engg. Physics , Chemistry and Mathematics	University of Mysore Mysore
Electrical & Electronics Engg.	Kuvempu University Shimoga

Ongoing Research Projects

- Image Processing technique for automated inspection & flow Visualization
- View Metrology on un-calibrated 2-d images and an approach to 3-d modeling and rendering

Deputy Dean Research
Sri.Anand M J
Assistant Professor
Dept. of Electronics and Communication Engg.

Dean (Research)
Dr. S L Ajit Prasad
Professor
Department of Mechanical Engineering

Centres of Excellence

- **Dr. V. Sridhar** **VLSI Design Lab**

  To provide good VLSI design facility to UG and PG students and develop a facilities to research scholars in the field of VLSI design for achieving excellence in this field. To motivate faculty members to take up research work and guide students in this specialize area. To conduct regular training program for students and faculty members from other colleges and polytechniques who wants to improve their knowledge and practical skill in VLSI design and embedded system. The facilities available in the VLSI and HDL lab are CAD tools 6.1.6.64 bit version, Xilinx EDA tool ISE 14.2 software and FPGA kit such as Spartan 6,Virtex 5 ,Virtex 6. Using these facilities, the PG and UG students can do experiments and projects in VLSI design and HDL. The research scholar can use these facilities for doing research in this area.

- **Dr. H. V. Ravindra** **Center for Diagnostic Maintenance (CDM)**

  Condition-Based Maintenance (CBM) and Prognostics has emerged over recent years as a significant technology that is making an impact on industrial maintenance practices. CBM technology is characterized by the merging and strong coupling of interdisciplinary trends from the engineering sciences, computer sciences, reliability engineering, communications, management, etc. All these diagnostic and prognostic technology elements, techniques, and capabilities must be applied and implemented wisely to obtain the maximum benefit impacts. The applications are in manufacturing systems, power plants, turbines, bearings, chemical plants, on-board car-engine diagnosis. Condition monitoring equipment is used extensively in the energy, petrochemical, cement, steel, paper and pulp industries.

- **Dr. H.S. Sheshadri** **Medical Image processing laboratory**

  Facilities / services available: High end work stations with high resolution monitors (desktop computers), MATLAB Software-Version 15.B, Teaching Aid Interactive Panel, Network Accessories Router Cisco 1905. Work being carried in the areas; Diabetic Retinopathy, Retinopathy of Prematurity, MRI Image segmentation algorithms and Medical Image Denoising.

- **Dr. B. Ramachandra** **High Voltage Insulation Laboratory**

  Facilities / services available: Shielded Chamber Based on faraday cage Principle, Vacuum system with high pressure chamber, High Frequency High Voltage Generator, Aplab 30MHz Dual Trace Oscilloscope, PD free High voltage Generation Unit, Shielded chamber based on Faraday Cage principle & PC based partial Discharge analyzer

- **Dr. L. Prasannakumar** **Center for Alternative Energy Resource (CAER)**

  Facilities / services available: Awareness on Rain Water Harvesting and Bore well recharging techniques, Global warming, Green Environment, Water Pollution, Demonstration of Solar Energy, Bio- Fuel and Bio Gas production using Kitchen waste. Encouraging various research activities in the entire Bio fuel chain involving universities and research organization (UG students project program)

- **Dr. M C Padma** **Internet of Things (IoT) Laboratory**

  Facilities / services available: Development boards compatible with Arduino platform, microchip chipkit platform and Zolertia boards, Raspberry PI boards for embedded and sensor networks and HP Intel core duo systems. Lab is dedicated for doing project and research oriented work.

Tie-ups with Foreign Universities

Binghamton University, USA, A world-class institution established in the year 1946 and located in the high – tech heart of New York State of USA. Binghamton University (BU) is one of the premier public universities in the north east. BU offers student a broad, interdisciplinary education with an international perspective and one of the most vibrant Master and Doctoral (research) programs. Ranked 10 among the elite public universities in the country, Binghamton challenges students academically, not financially, in its unique, best-of-both-worlds environment.

PESCE, Mandya has signed a Memorandum of Agreement (MOA) with BU on 25th of May 2017, at 4400 Vestal Parkway East, Binghamton, NY 13902, USA. The collaboration aims to foster advancement in teaching, research, academic collaboration and cultural understanding and to create avenues for enhancing learner experience at both entities as well as strengthen both entities. PES college and Binghamton university will broadly explore avenues for cooperation in i) Student and faculty Exchange, ii) short courses, iii) Joint Research and Workshops, iv) Exchange and sharing of research and teaching ideas, v) PhD co-advising and vi) other Academic Exchanges.

Portland state University, USA

Portland state University (PSU) is Oregon's public urban research university located in the heart of downtown of Portland situated at North West of USA. It is ranked as one of the nation's top 10 "most innovative" universities by *U.S.*

Initial talks have taken place between PESCE, Mandya and the Department of Electronics and Computer Science Engineering of PSU to have Research Collaboration and other academic exchanges.

Industry Institute Interaction activities

Now a days India plays a major role in the rapid change of technology, the developments at various fields of technologies are due to the contribution of both industry and academia of the country. The industry and institution are interdependent on each other for new inventions and discoveries to meet the demands of the present problems of the society. It is a fact that when industry and institution go by hand to hand and cooperate with each other so that more innovations can happen. This creates healthy environment in the country by which there will be an all round development. This would be an important factor in making the economy of the country more strong. Both industry and institution play a vital role in the development of the nation.

For the above reason, the college has initiated the formation of Industry Institute Interaction Cell (with a Dean and one III coordinator from each department) in the year 2015 to boost up the following activities of Industry interaction

- Helping to carry out consultancy works
- Revenue generation programs for Institute
- Industrial training for students in your organization
- Student project work in industries/your organization
- Industry Study Tour Programmes
- Interaction with your organizations for conducting joint research work involving faculty/ scientists and students/ research scholars,
- Faculty exchanges
- Personality development workshop
- Guest lectures
- Continuing education programmes
- Short - term training programmes
- In house training programmes
- Industrial visits
- Deputing your faculty to work during the lean period
- Organizing workshop/seminar periodically and invite the corporate people to deliver lecture and interact
- Joint Faculty Development Programs
- Panel Discussions
- CEO Interactions
- Corporate Excellence Award Functions / Institution of Awards by your organizations
- Signing MOU's with industry and other institutes.

MOU’s with Company/Organizations

- Coreel Technologies, Bengaluru
- Meritor HVS India Ltd., Mysuru
- Here Solutions India Pvt.Ltd, Gurgaon
- NVIDIA Graphics Pvt.Ltd., Bengaluru
- Forth Ambit Technologies Pvt.Ltd.Bengaluru
- Global edge Software Ltd. Bengaluru
- APTINIA Inc., Bengaluru
- Sri Manjunatha Design Solution, Bengaluru
- IEEE, New York, USA
- Infosys Ltd., Mysuru

- FTD Automation Pvt. Ltd. Bengaluru
- EMC^2,Bengaluru
- Tiny chip solutions, Bengaluru
- Perk data systems Pvt. Ltd. Bengaluru
- Foundation for Advancement of Education and Research (FAER), Bengaluru
- Intel, Bengaluru
- Quality Evaluation and Systems Team Pvt. Ltd., Bengaluru
- Seven craft groups, Bengaluru

MOU's (Under Process) with Company/Organizations

- Vi Microsystems Pvt. Ltd., Chennai
- Yokogawa Technical School, Bengaluru
- Bosch India Pvt. Ltd. Bengaluru
- Zes Tech Global Pvt. Ltd. Bengaluru
- Sun softronic systems, Bengaluru
- M/s Zebra Technologies India Pvt. Ltd,(Motorola solutions), Bengaluru
- Torsteel Ltd. Bengaluru
- M/s N. Ranga Rao and Sons, Mysuru
- M/s Shahi garments, Bangaluru

Number of MOU's	**:**	**18**
MOU's Under Process	**:**	**09**
Total	**:**	**27**

MOU with Industries

- ✓ **Tata ELEXI**: EC, CSE, ISE Students projects
- ✓ **Coreel Technologies, Bengaluru**
- ✓ Meritor HVS India Ltd., Mysuru
- ✓ Here Solutions India Pvt. Ltd, Gurgaon
- ✓ NVIDIA Graphics Pvt. Ltd., Bengaluru
- ✓ Forth Ambit Technologies Pvt. Ltd. Bengaluru
- ✓ APTINIA Inc., Bengaluru
- ✓ IEEE, New York, USA
- ✓ Foundation for Advancement of Education and Research (FAER), Bengaluru
- ✓ Intel, Bengaluru
- ✓ FTD Automation Pvt. Ltd. Bengaluru
- ✓ EICHER Tractor Ltd
- ✓ MICO BOSCH Bengaluru
- ✓ **NIMHANS**: ISE Research association. To support FMRI data
- ✓ **Ktwo**: EC, CSE, ISE Research
- ✓ **EMC^2** : EC, CSE, ISE Training Faculty and students in Mass storage
- ✓ **Infosys:** All Campus connect programme
- ✓ **Naviqure**: EC Research
- ✓ **Builders Associations**: Civil Constructions related training activities
- ✓ **TCS**: All programs for placement reg.
- ✓ **Global Edge**: EC, CSE, ISE Training Faculty and students.

Student Associations:

To enhance academic progression and creative culture of students, our Institution encourages the students to take part in various activities being conducted by the following associations

- IEEE
- ISTE PESCE CHAPTER
- SAE COLLEGIATE CLUB
- CSI
- NEN
- GLUG

Strengths

- Committed Management
- Good Brand Name
- Good Infrastructure
- Aided & Autonomous Institution
- Qualified & Experienced Faculty
- High Retention of Employees
- Research Expertise (30 % Ph.Ds)
- TEQIP and Research Grants
- 100 % Admissions
- Green Campus
- Very Good Sports Complex
- Strong Alumni

Opportunities

- Innovative learning & teaching
- MOUs/Collaborations
- Starting of New Courses in Engineering
- Global initiatives
- Use of latest technology
- Upgrading faculty through QIP
- Establishing Residential Campus
- Opening of New campuses
- University status

Our Illustrious Alumni

Sri. Umesh Chandra, Exicutive Director Aerospace, BEML Ltd., Bengaluru		Dr B N Suresh, Padmavibushana Awardee, Director of ISRO's, Vikram Sarabhai Space Centre (VSSC), Thiruvananthapuram
Dr. S. Guruprasad, Advisor, R & DE (Engg.), Defense Research & Development Organization (DRDO) Ministry of Defense, Govt. of India, New Delhi.		Mr. Ivan Fernandes, chairman and Managing Director, Ducont, Dubai - 1985 batch
		Mr. Gopal Krishana, Mico Bosh Ltd. , Bangaluru
Mr. Samartha Raghava Nagabhushan, Managing Director and CEO 5BARZ India. 1993 batch		Vipin Chandra Shetty, Hydrolagost, serving in Gulf countries
		G.M. Madegowda, Superindent engineer, KUESB, Hubli
Mrs. Sheela Prabhakar, Vice president, Industrial & Defence Solutions, ITTIAM system, B'lore – 1984 batch		Mr. Rangaraj M Rangayyan, Professor, Dept of Electrical and Computer Engg, University of Calgary – 1976
Dr. Sumohan, Associate Professor, IIT Hydrabad		Mr. Sudheendra Koushik, Vice president Innovation, TTK Groups
Dr. M K Krishana, Director, CMRTU, Bangaluru		M Vasu, Division Controller KSRTC, Karnataka
Mr.Annadani, Senior Manager, Volvo Ltd., Bangaluru.		Mr. Mohan Iyenger, Vice-President General Motors

****

Regulations Governing Bachelor of Engineering Program

1. GENERAL

1.1 The General regulations are common for all degree level undergraduate programs and shall be called as Bachelor of Engineering (B.E.) conducted at PES College of Engineering. Mandya. All the rules and regulations have been approved by the Academic Council Constituted by PESCE, Mandya.

1.2 Duration of the Course

The course shall have a requirement of 200 credits, which a student can ordinarily complete in EIGHT Semesters spread over 48 months.

1.3 Academic Calendar

1.3.1 The Academic Calendar prepared by the Principal, Dean (Academic) and Controller of Examinations shall consist of the schedule of academic activities for Odd / Even academic Semester and it shall be announced before the commencement of each academic Semester.

1.3.2 An Academic Year consists of Two Semesters:
Odd and Even Semesters Schedule - 20 Weeks

Registration & Course work	: 16 weeks
Preparatory Holidays	: 1 week
Semester End Examinations	: 2 weeks
Answer scripts viewing, Declaration of Results & Registration for Make-up Term	: 1 week

1.3.3 Contact sessions for Make-up Term : 1 week

1.3.4 Make-up Examinations & Declaration of results : 3 weeks

1.3.5 Vacation between semesters : 2 weeks

1.3.6 The academic calendar shall be adhered strictly. In case any of the teaching days are declared as holidays for some reasons, the lost classes shall be made up by conducting makeup classes within a week.

2. DEGREE PROGRAMS

2.1 B.E degree programs are offered in the following disciplines by the respective departments:

I Automobile Engineering (AU)
II Civil Engineering (CV)
III Computer Science and Engineering (CS & E)
IV Electrical and Electronics Engineering (E & E)
V Electronics and Communication Engineering(E & C)
VI Industrial Production Engineering (IP & E)
VII Information Science and Engineering (IS & E)
VIII Mechanical Engineering (ME)

Other Teaching departments are:
Physics (PH)
Chemistry (CH)
Mathematics (MA)
Humanity, Social Science and Management (HU)

2.2 The provisions of these regulations shall be applicable to any new discipline that may be introduced from time to time and appended to the above list.

3. ADMISSION

3.1 Admission to first year:

Candidates seeking admission to B.E. programs must fulfill the eligibility requirements stipulated by the Karnataka State Govt. at the time of admission. The selection procedure for admission shall be as stipulated by the Karnataka State Govt. through Common Entrance Test (CET) and COMEDK. The eligibility requirements and admission procedure for admission to first year B.E. Programs may be changed from time to time by the Karnataka State Govt.

3.2 Direct Admission to Second Year (Lateral Entry)

Candidates seeking direct admission to the second year B.E program must fulfill eligibility requirements and selection procedures shall be stipulated by Government of Karnataka.

Candidates who have passed three year Diploma Examination conducted by the Director of Technical Education, Govt. of Karnataka can seek admission to B.E programs to the branch in which they have been awarded the Diploma.

3.3 A limited Number of admissions are offered to Non Resident Indians and Management Candidates in accordance with the rules issued by the Govt. of Karnataka/ Govt. of India from time to time.

3.4 Transfer of Students from Other College and other University

Admission of students to the college from other College and University or from other University is governed by the existing rules stipulated by Visvesvaraya Technological University, Belagavi and Govt. of Karnataka.

4. COURSE STRUCTURE

4.1 The B.E Program shall consist of a number of courses and each course shall be assigned with credits. The total Credit requirements for the B.E degree for regular and lateral entry students are 200 and 154 respectively. The total course package for a B.E. Degree program will typically consists of

I	Basic Science Core Courses	25 - 30 credits
II	Engineering Science Core Courses (Engg. Foundation courses)	10 - 20 credits
III	Humanities and Social Science, Soft Skills & Technical training Core Courses	04 - 10 credits
IV	Program Core courses	90 - 120 credits
V	Elective courses: An elective course can be any of the following: Basic Sciences, Engineering Sciences, Humanities, Social Science and Management Departmental subjects	16 - 30 credits
VI	Other Electives (Open and self Study courses)	04 - 10 credits
VII	Departmental/ Programme Mini project & Industrial Visit & Interaction	02 credits
VIII	Departmental/ Programme Major project	10 credits
IX	Mandatory Learning Courses	No credits

4.2 Credits and Working Hours per week

The number of credits of a course in a semester shall ordinarily be calculated as under:

a. **Lecture:** One lecture hour per week shall be assigned one credit.
b. **Tutorial:** Two tutorial hours per week shall be assigned one credit.
c. **Practical:** Two laboratory hours per week shall be assigned one credit. Not more than three credits may be assigned to a practical course having only laboratory component. The courses having three hours of contact every alternate week shall be one credit only.
d. **Drawing:** Two drawing class hours per week shall be assigned one credit.

e. **Mini-project / Industrial visit / Seminars / Main Projects:** Assignment of credits or non credits like mandatory learning courses are as decided by the Academic Council.

4.3 The Departmental Undergraduate Committee (DUGC) will discuss and recommend the exact credits offered for the program and the syllabi of all undergraduate programs offered by the department from time to time before sending the same to the Board of Studies (BOS of PESCE). The BOS will consider the proposal from the department and make recommendation to the Academic Council (AC of PESCE) for consideration and approval.

4.3.1 The course Instructor shall announce in the class, and / or display at the Faculty room/ website, the details of the Evaluation Scheme, including the distribution of the weightage for each of the components and method of conversion from the raw scores to the letter grades; within the first week of the semester in which the course is offered, so that there are no ambiguities in communicating the same to all the students concerned.

4.4 Courses of Special Nature

In addition to the regular courses which are typically theory and practical there may be additional courses of special nature.

4.4.1

a. The curriculum may contain Industry Interaction such as Industry/ Field visit, during 5th Semester of the Academic program with number of credits limited to one credit.

b. The curriculum may contain a mini project work during 6th semester to carry out a design / fabrication/ simulation type of project. There shall be one mini project in the academic program with number of credits limited to one credit.

4.4.2 Mandatory Learning Courses (MLC) & one credit courses.

These MLC courses & One Credit Courses must be completed by the student as stipulated below

Sl.No.	Title of the Courses		Sem.	Completion Criteria
1.	Indian Constitution, Human Rights & Professional Ethics, Environmental Studies, Kannada (MLC)	***Mandatory Learning Courses***	I&II	To be completed within 4th semester
2.	Additional Mathematics I and II for Lateral Entry with diploma qualification (MLC)		III & IV	To be completed within 6th semester
3.	Aptitude and Reasoning Development - BEGINNER (ARDB) (MLC)		III	
4.	Education Tour (MLC)		VII	To be completed before the regular 7th semester or as stipulated by DUGC of concerned department
5.	Effective Communication Development.(ECD)	***One credit courses***	I	To be completed within 4th semester
6.	Professional Communication Development (PCD)		II	
7.	Aptitude and Reasoning Development – Intermediate (ARDI)		IV	To be completed within 6th semester
8.	Industry Visit & Interaction		V	To be completed within 8th semester for the award of BE degree
9.	Aptitude and Reasoning Development – Advanced. (ARDA)		V	
10.	Mini Project		VI	
11.	Aptitude and Reasoning Development – EXPERT(ARDE)		VI	

PP grade awarded for satisfactory completion of the course.

NP grade awarded for non completion of the course.

But student has to re-register for the same course or he/she can opt for other courses if there is multiple options. The PP and NP grades are not included in SGPA and CGPA computations.

4.4.3 Project work

Generally, project work is offered in the 7th and/or 8th semesters of the B.E program. Not more than 4 students in a batch can carry out the project and same has to be registered for the course. Project-work Viva-voce examination shall be conducted individually. However the total credits for main project is limited to 10.

4.4.4 Self study course & Seminar

Each Candidate has to give one seminar, where the seminar topic shall be selected from the emerging area. The student has to attend all the seminars. Total credits for the Self study course & Seminar is limited to two credits.

5. REGISTRATION

5.1 Registration

Every student after consulting faculty advisor is required to register for the approved courses with DUGC of parent department at the commencement of each semester on the registration day which will be notified in the academic calendar.

5.2 Late Registration

Late registration may be permitted only for valid reasons on payment of late registration fee within the prescribed date.

5.3 Registration in Absentia

Registration in absentia may be allowed only in rare cases like of illness or other contingencies. Request should be forwarded by faculty advisor and DUGC, finally should be approved by Dean (Academic).

5.4 Eligibility for Registration

To be eligible to register for a higher semester, the student must have earned the required number of credits as stipulated for vertical progression as indicated in section 9.13.

5.5 a)Registration for backlog Courses

Students who could not complete course/s of odd or even (or both) semester/s in the respective SEE and subsequent **two** make-up examinations of a particular academic year, need to re-register for such courses during next academic year (corresponding odd / even semester) as fresh course/s, foregoing previous CIE marks.

b) Registration for detained course/s

Students detained for entire academic year for not fulfilling eligibility criteria for upward movement as per section 9.13 need to reregister during next academic year (corresponding odd/even semester) as fresh course/s and are eligible for SEE only after fulfilling satisfactory CIE and attendance.

c) Students having backlog course/s for having secured 'N' grade in either odd or even semester of a academic year need to re-register during next academic year (corresponding odd/even semester) as fresh course/s and are eligible for SEE only after fulfilling satisfactory CIE.

d) Registration of New Scheme

Students who could not complete Course/s of ODD or EVEN or (Both) Semester/s in the old Scheme MANDATORILY need to switch over to NEW Scheme as and when notified by the concerned departments.

5.6 Students who wish to reject prescribed courses of a particular semester/academic year, as per section 7.1, need to re-join by registering for all such courses in the subsequent

academic year, with the approval from the Principal in accordance with the University regulations.

5.7 Minimum and Maximum Number of Credits

A student must register for the prescribed number of courses in a semester. The minimum number of credits for which a student can register is 20. The maximum number of credits for which a student can register is 30. However the student is advised to register for an average of 25 credits in each semester.

5.8 A student has the option to ADD courses for registration till the date specified for late registration.

5.9 The student has an option to DROP course from registration as notified in the Academic calendar.

5.10 A student can register for auditing a course, or a course can be converted from credit to audit or from audit to credit in consultation with the faculty advisor as notified in the Academic calendar best CORE courses cannot be converted for audit. Even for audit courses student has to go through a minimum level of evaluation and also the minimum attendance requirement. As per the advice of DUGC, "U" grade is awarded for such audit courses, failing which; such courses will not be listed in grade card.

6. ATTENDANCE REQUIREMENT

6.1 The student has to put in a minimum attendance of 85% in each course with a provision of condonation of 10% of the attendance due to illness, participation in co-curricular activities such as Seminars, Workshops, Paper presentation etc. and extra Curricular activities such as Sports, Cultural Activities etc.

6.2 The student shall be informed about their shortage of attendance periodically by the department to make up the shortage.

6.3 Students having attendance less than 75% in course/courses shall be awarded "N" grade. However, the core committee constituted by the college will decide on case to case basis for either Re-registration for such course/courses or being detained. If the same course is not offered, equivalent course recommended by DUGC should be taken, in case of change of scheme.

7. WITHDRAWAL FROM THE COURSE

7.1 Temporary Withdrawal

Normally a student will be permitted only one temporary withdrawal during his/her tenure as a student. A student may be permitted to withdraw temporarily from the course for a period of one semester or more on the grounds of prolonged illness or grave calamity in the family etc., provided:

i. The student submits the reasons for withdrawal along with the supporting documents and endorsement from the parent/guardian.
ii. There shall not be any dues with the departments / hostel /college / library etc.
iii. The DUGC recommends considering that the student completes the remaining courses within the stipulated time available for the degree (8 years)
iv. Tuition fee should have been paid by the student for that year
v. Scholarship holders are bound by the appropriate rules applicable to them.

7.2 Permanent Withdrawal

Any student who withdraws admission before the closing date of admission for the Academic Session is eligible for the refund of the deposits only. The Fees once paid will not be refunded under any circumstances.

Once the admission for the year is closed then the following conditions are applicable for withdrawal of admissions.

a. A student who wants to leave the Institution, will be permitted to do so (and take Transfer Certificate from the institution, if needed), only after remitting the Tuition fee as applicable for the remaining years and clearing other dues, if any.
b. Those students who have received any scholarship, stipend or other forms of assistance from the Institution shall repay all such amounts.

The decision of the Principal of Institution regarding withdrawal of a student is final and binding.

8. CHANGE OF BRANCH AND INSTITUTION

8.1 Change of Branch

A student may be given the change of branch after completion of first two semesters based purely on merit in accordance with the provision laid down by the concerned authority.

8.1.1. Procedure for giving change of Branch

a. Application for change of branch along with grade cards shall be received from the students as per notification from time to time.
b. Change of Branch shall be given strictly in the order of merit based on the CGPA obtained at the end of second semester. In case of tie, the actual marks scored by the applicant will be considered.
c. Change of Branch may be given from a particular branch that the minimum number of students shall be maintained at 75%. The number of vacancies available in a particular branch is determined by the maximum sanction intake relative to the actual number of students present in the beginning of the 3rd semester before implementation of the change of branch.

8.2 Change of Institution

a. Transfer of students from one College to another College within Karnataka State is permitted as approved by the academic council of the Institution and VTU only at the beginning of third semester, subject to availability of seats within the permitted intake in respective Institutions.
b. The candidates seeking admission are to be only from VTU and shall have to apply for establishment of equivalence with prescribed fee as notified by the Institution.
c. Candidates from other universities must obtain eligibility/Equivalence approval from VTU.

9. Evaluation System:

9.1Course credit pattern:

All courses comprise of specific Lecture-Tutorial-Practical (L-T-P). The course credits are fixed based on the following norms:

I One hour lecture per week is assigned one credit
II Two hours tutorial per week is assigned one credit
III Two hours lab per week is assigned one credit

Examples:

L-T-P schedule 4-0-0 will be assigned four credits
L-T-P schedule 3-2-0 will be assigned four credits
L-T-P schedule 3-2-2 will be assigned five credits
L-T-P schedule 0-0-3 will be assigned 1.5 credits

9.2 The academic performance evaluation of a student shall be according to a letter grading system based on CIE (Continuous Internal Evaluation) and SEE (Semester End Examination).

The letter grades S A B C D E F indicate the level of academic achievement assessed on a 10 point scale.

Letter Grades:	**S**	**A**	**B**	**C**	**D**	**E**	**F**
Grade Points:	**10**	**9**	**8**	**7**	**5**	**4**	**0**

Students appeared for Make-up Examination and subsequent Make-up / SEE examinations will be awarded one Grade lower than what they achieve except E and F Grades.

9.3 Passing Standards

9.3.1 Based on the performance in CIE and SEE the letter grade is awarded to a student in a course. A student should secure minimum of 50% in CIE and also minimum of 40% in SEE. Altogether a student has to secure a minimum of 45% of marks (50% in CIE and 40% in SEE marks put together) to complete a course.

9.3.2 Transitional Grades:

- Grade-I is awarded to a student having satisfactory attendance and meeting the passing standards at CIE, but absent for SEE for the following valid and convincing reasons acceptable to the college.
  i. Illness or accident which disabled the student from attending the SEE
  ii. A calamity in the family at a time of SEE which required the Student to be away from the college.
- Grade -G is awarded to a student having satisfactory attendance and CIE, but absent for SEE.
- Grade-W is awarded to a student having satisfactory attendance, but withdrawing from that course before the prescribed date in a Semester as per Faculty Advice.
- Grade -N is awarded to a student not fulfilling either satisfactory attendance and / or CIE.

9.3.3 Make-up Term:

Students awarded with F, I and G grades in odd or even semester of the academic year should register for such courses conducted during Make-up Term. The schedule for the Make-up Examination is mentioned in sections 1.3.2, 1.3.3, 1.3.4.

9.3.4 Students are required to submit examination application form by furnishing true information and appear for SEE / Make-up examination or both. Results of a student will be forfeited in case he/she furnish false information deviating the pertaining autonomous regulations of PESCE with regard to CIE/attendance or both and, other requirements.

9.4 The Letter grade awarded to a student in a course, for which student has registered shall be based on CIE and SEE. The distributions of weightage among these components are as follows:

Particulars	Details	Evaluation
I - Test	Syllabus coverage is 40%. (35 marks) There will be quiz along with test (5 marks)	Average marks of two tests along with two Quiz's and 10 marks of assignment shall form CIE of 50 marks
II - Test	Syllabus coverage is next 40%. (35 marks) There will be quiz along with test (5 marks)	
Assignment	10 marks	
SEE	Final examination to be conducted for full syllabus for 100 marks.	SEE marks reduced to 50 marks.

Make-up test may be given to improve the performance of CIE, subject to maximum of 25 marks only.

9.5 The letter grade awarded to a student in a theory course is based on an appropriate CIE and SEE. SEE evaluation includes review of 20 to 30 % answer scripts by external examiners outside the college.

9.6 The letter grade awarded to a student in a Practical course is based on an appropriate CIE and SEE. 50 marks for CIE and 50 marks for SEE are assigned and SEE will be conducted by two examiners (one internal & one external).

9.7 Letter Grades and Grade Points:

Letter Grade	Grade – Points	Raw Score	Remark
S	10	90% and above	Outstanding
A	09	75-89%	Excellent
B	08	60-74%	Very Good
C	07	50-59%	Good
D	05	46-49%	Average
E	04	45 %	Fair
F	00	< 45 %	Fail
G			Absent for SEE
I			Incomplete
U			Audited
W			Withdrawal
N			Not Eligible
PP (For Non-credit courses)			Passed
NP (For Non-credit courses)			Not passed

9.8 Earned Credits:

This refers to the credits assigned to the course in which a student has obtained letter grades either S grade or any one of the A, B, C, D, E.

9.9 Evaluation of Performance:

The overall performance of a student will be indicted by two indices:

SGPA, which is the Semester Grade Point Average, and **CGPA** which is the Cumulative Grade Point Average.

SGPA for a semester is computed as follows:

$$\mathbf{SGPA} = \frac{\sum \text{[(Course credit) X (Grade point)] (For all courses that semester excluding transitional grades)}}{\sum \text{[(Course credits)] (For all the courses in that semester excluding transitional grades)}}$$

CGPA is computed as follows:

$$\mathbf{CGPA} = \frac{\sum \text{[(Course credit) X (Grade point) (Considering all courses)]}}{\sum \text{[(Course credits)]}}$$

*** Grade card will reflect CGPA, only after successful completion of B.E. Program.**

9.10 The percentage equivalence of Grade Points for class declaration are as follows.

SGPA / CGPA	Percentage of Marks / Class
5.75	50 (Second Class)
6.25	55
6.75	60 (First Class)
7.25	65
7.75	70 (Distinction)
8.25	75

9.11 Communication of grades:

a) The course instructors shall submit the CIE marks of each student in his course to COE through Chairman, DUGC within the stipulated date.
b) On completion of SEE, the students will be given an opportunity to view their answer scripts through the concerned course instructors. Any discrepancy with regard to evaluation will be finalised by DUGC of the concerned departments.
c) The final grades will be awarded by the Controller of Examinations after receiving SEE marks from DUGC of the respective department.
d) The student Progress Report shall contain the Letter Grade along with the SGPA and CGPA.

9.12Appeal for Review of Grades:

a) In case of any grievances about the SEE Grades, a student can appeal for review of grades to the Controller of Examinations by applying for challenge valuation. The fee for such an appeal will be decided by the Institution authority from time to time
b) The challenge valuation and Make-up Examinations answer script viewing are also permitted as these answer scripts are evaluated by two examiners jointly.

9.13 Eligibility criteria for upward movement

1. Students are eligible to register following semesters as per the conditions mentioned below:

Semester	Eligibility Criteria
I	--
II	--
III	Can carry maximum of four incomplete courses from previous two semesters(I & II)$^{\#}$& should have fulfilled conditions mentioned in section 4.4.2
IV	--
V	Can carry maximum of four incomplete courses from previous three semesters (II, III$^{\#}$& IV$^{\#}$) and**,** completed all courses of 1st semester &Should have fulfilled conditions mentioned in section 4.4.2
VI	--
VII	Can carry maximum of four incomplete courses from previous three semesters (IV, V$^{\#}$& VI$^{\#}$) and**,** completed all courses of I, II and III semesters& Should have fulfilled conditions mentioned in section 4.4.2
VIII	--

 # Excluding one credit courses and mandatory learning courses

10 DEGREE REQUIREMENTS:

The degree requirements of a student for the BE programme is as follows:

10.1 College Requirements:

I Minimum Earned Credit Requirement for Degree is 200
II Minimum Earned Credit Requirement for Lateral entry students is 154
III Satisfactory Completion of all Mandatory Learning Courses.
IV Completion of the requirements on Co curricular and / or Extra- curricular activities.

10.2 Program Requirements:

Minimum Earned Credit Requirements on all core courses, Elective Courses and major project as specified by the DUGC.

10.3 The maximum duration for a student for complying to the Degree requirements is 16 semesters from the date of first registration for first semester.

11. TERMINATION FROM THE PROGRAMME:

Student shall be required to leave the College without the award of the Degree, under the following circumstances:

I Failing to secure Degree within the stipulated period of Eight (08) years.

II Failure to meet the standards of discipline as prescribed by the Institution and recommendation of the appropriate committee, from time to time.

12. GRADUATION REQUIREMENTS:

A Student shall be declared to be eligible for the award of the degree if

a) Fulfilled Degree Requirements
b) No Dues to the College, Departments, Hostels, Library, Central Computer Centre and any other centers.
c) No disciplinary action pending.

The award of the degree must be recommended by the Academic Council.

Graduation ceremony:

Provisional degree will be awarded in person or in absentia for the students who have successfully completed the degree requirements during the preceding academic year.

Students are required to apply for the convocation along with prescribed fee to the university after having satisfactorily completed all the degree requirements within the specified date for the award of degree.

13. AWARD OF PRIZES, MEDALS & RANKS:

For the award of Prizes and Medals, the conditions stipulated by the Donor may be considered as per the statutes framed by the College for such awards. The ranks are given to candidates who do not obtain F grade in any courses of their study.

14. CONDUCT AND DISCIPLINE:

Students shall conduct themselves within and outside the premises of the College, in a manner befitting the students of an institution of National importance.

As per the order of Honorable Supreme Court of India, ragging in any form is considered as a Criminal offence and is banned and any form of involvement in ragging will be severely dealt with.

The following acts of omission/ or commission shall constitute gross violation of the code of conduct and are liable to invoke disciplinary measures

a. Ragging.
b. Lack of courtesy and decorum; indecent behavior anywhere within or outside the campus.
c. Possession and use of mobile phones inside the institution premises.
d. Willful damage or stealthy removal of any property / belongings of the College/Hostel or of fellow students/ Citizens.
e. Possession, consumption or distribution of alcoholic drinks or any kind of hallucinogenic drugs.
f. Mutilation or unauthorized possession of Library books.
g. Noisy and unseemly behavior, disturbing studies of fellow students.
h. Hacking in computer systems(such as entering into other Person’s area without prior permission, manipulation and /or Damage of Computer hardware and Software or any other Cyber Crime etc.,).

i. Plagiarism of any nature.
j. Any other act of gross indiscipline and malpractice as decided by the Academic Council from time to time. Commensurate with the gravity of offense, the punishment may be to reprimand, expulsion from the hostel, debarment from an examination, disallowing the use of certain facilities of the College, rustication for a specified period or even outright expulsion from the College or even handing over the case to appropriate law enforcement authorities or the judiciary, as required by the circumstances.

For an offence committed in a hostel or in a department or in a class room and elsewhere, the Chief Warden, the Head of the Department and the Student Welfare Officer, shall be the authority to reprimand or impose fine.

All students after seeking admission to this Autonomous Institution, right from course registration till the date of declaration of graduation, any cases of adoption of unfair means and/ or any malpractice related to examination shall be reported to Controller of Examination. All such cases involving punishment / fine reprimand shall be referred to the committee / Malpractice Committee (as the case maybe) and decision of Controller of Exams will be final and binding.

Note: The Authorities of P.E.S. College of Engineering, Mandya have rights to make Amendments to the above Rules and Regulations from time to time and the same is binding on students.

****

P.E.S. COLLEGE OF ENGINEERING, MANDYA

(An Autonomous Institution)

Bachelor of Engineering

Scheme of Teaching and Examination [CBCS with OBE]

I Semester B.E. Scheme of Teaching and Examination Physics Group									
Sl. No	Course Code	Course	Teaching Department	Board	Hrs/Week L:T:P:H #	Credits	Examination Marks		
							CIE	SEE	Total
1.	P17MA11	Engineering Mathematics-I	MA	MA	3:2:0:5	4	50	50	100
2.	P17PH12	Engineering Physics	PH	PH	4:0:0:4	4	50	50	100
3.	P17CV13	Engineering Mechanics	CV	CV	4:0:04	4	50	50	100
4.	P17ME14	Elements of Mechanical Engineering	ME	ME	4:0:0:4	4	50	50	100
5.	P17EE15	Basic Electrical Engineering	EE	EE	4:0:0:4	4	50	50	100
6.	P17MEL16	Basic Mechanical Engg. Science Lab	ME/AE	ME/AE	0:0:3:3	1.5	50	50	100
7.	P17PHL17	Engineering Physics Lab	PH	PH	0:0:3:3	1.5	50	50	100
8	P17HU18	Effective Communication Development. (ECD)	HM	HM	2:0:0:2	1	50	*50*	100
9	P17HM19	*****Indian Constitution, Human Rights & Professional Ethics(ICHRPE)	HM	HM	2:0:0:2	0	---	--	--
Total						24	400	400	800
MA : Mathematics; PH : Physics; AE: Automobile Engineering ; CV :Civil Engg; ME : Mech, Engg; EE: E & E Engg; HM : Humanities, Social Science & Management									
***** ICHRPE/Language (Kannada) :- Students shall have to pass these Mandatory Learning Course/s before completion of IV Semester									

I Semester B.E. Scheme of Teaching and Examination Chemistry Group									
Sl. No	Course Code	Course	Teaching Department	Board	Hrs/Week L:T:P:H #	Credits	Examination Marks		
							CIE	SEE	Total
1.	P17MA11	Engineering Mathematics-I	MA	MA	3:2:0:5	4	50	50	100
2.	P17CH12	Engineering Chemistry	CH	CH	4:0:0:4	4	50	50	100
3.	P17CS13	Computer Concepts & C Programming	CS	CS	4:0:0:4	4	50	50	100
4.	P17MED14	Computer Aided Engineering Drawing	ME	ME	2:0:4:6	4	50	50	100
5.	P17EC15	Basic Electronics	EC	EC	4:0:0:4	4	50	50	100
6.	P17CSL16	Computer Programming Lab	CS	CS	0:0:3:3	1.5	50	50	100
7.	P17CHL17	Engineering Chemistry Lab	CH	CH	0:0:3:3	1.5	50	50	100
8	P17HU18	Effective Communication Development.(ECD)	HM	HM	2:0:0:2	1	50	*50*	100
9.	P17EV19	*****Environmental Studies	EV	EV	2:0:0:2	0	---	--	--
10	P17HM110	***** Language (Kan.)	HM	HM	2:0:0:2	0	---	--	--
Total						24	400	400	800
MA : Mathematics; CH : Chemistry; CV :Civil Engg; ME : Mech, Engg; EC: E & C Engg; Environmental Engineering; HM : Humanities, Social Science & Management									
*****Env. Studies /Language (Kannada):- Students shall have to pass these Mandatory Learning Course/s before completion of IV- Semester									

L- Lecture, T-Tutorial, P- Practical, H- Total hours; CIE: Continuous Internal Evaluation; SEE: Semester End Examinations

P.E.S. COLLEGE OF ENGINEERING, MANDYA
(An Autonomous Institution)
SCHEME OF TEACHING AND EXAMINATION

II Semester B.E. **Physics Group**

Sl. No	Course Code	Course	Teaching Department	Board	Hrs/Week	Credits	Examination Marks		
					L:T:P:H #		CIE	SEE.	Total
1.	P17MA21	Engineering Mathematics-II	MA	MA	3:2:0:5	4	50	50	100
2.	P17PH22	Engineering Physics	PH	PH	4:0:0:4	4	50	50	100
3.	P17CV23	Engineering Mechanics	CV	CV	4:0:0:4	4	50	50	100
4.	P17ME24	Elements of Mechanical Engineering	ME	ME	4:0:0:4	4	50	50	100
5.	P17EE25	Basic Electrical Engineering	EE	EE	4:0:0:4	4	50	50	100
6.	P17MEL26	Basic Mechanical Engg. Science Lab	ME/AE	ME/AE	0:0:3:3	1.5	50	50	100
7.	P17PHL27	Engineering Physics Lab	PH	PH	0:0:3:3	1.5	50	50	100
8	P17HU28	Professional Communication Development(PCD)	HM	HM	2:0:0:2	1	50	50	100
9.	P17HM29	*****Indian Constitution, Human Rights & Professional Ethics(ICHRPE)	HM	HM	2:0:0:2	0	---	--	--
					Total	24	400	400	800

MA : Mathematics; PH : Physics; AE: Automobile Engineering ; CV :Civil Engg; ME : Mech, Engg; EE: E & E Engg; HM ; Humanities, Social Science & Management

*****ICHRPE/Language (Kannada) :- Students shall have to pass these Mandatory Learning Course/s before completion of IV Semester

P.E.S. COLLEGE OF ENGINEERING, MANDYA
(An Autonomous Institution)
SCHEME OF TEACHING AND EXAMINATION

II Semester B.E. **Chemistry Group**

Sl. No	Course Code	Course	Teaching Department	Board	Hrs/Week	Credits	Examination Marks		
					L:T:P:H #		CIE	SEE.	Total
1.	P17MA21	Engineering Mathematics-II	MA	MA	3:2:0:5	4	50	50	100
2.	P17CH22	Engineering Chemistry	CH	CH	4:0:0:4	4	50	50	100
3.	P17CS23	Computer Concepts & C Programming	CS	CS	4:0:0:4	4	50	50	100
4.	P17MED24	Computer Aided Engineering Drawing	ME	ME	2:4:0:6	4	50	50	100
5.	P17EC25	Basic Electronics	EC	EC	4:0:0:4	4	50	50	100
6.	P17CSL26	Computer Programming Lab	CS	CS	0:0:3:3	1.5	50	50	100
7.	P17CHL27	Engineering Chemistry Lab	CH	CH	0:0:3:3	1.5	50	50	100
8	P17HU28	Professional Communication Development(PCD)	HM	HM	2:0:0:2	1	50	*50*	100
9.	P17EV29	*****Environmental Studies	EV	EV	2:0:0:2	0	---	--	--
10	P17HM210	***** Language (Kan.)	HM	HM	2:0:0:2	0	---	--	--
		Total				24	400	400	800

MA : Mathematics; CH : Chemistruy; CV :Civil Engg; ME : Mech, Engg; EC: E & C Engg; Environmental Engineering; HM ; Humanities, Social Science & Management

*****Env. Studies/ Language (Kan.) :- Students shall have to pass these Mandatory Learning Course/s before completion of IV-Semester

Evaluation Scheme - CIE						
Weightage	**Marks**	**Event Break Up**				
50%	50	**Test I**	**Test II**	**Quiz I**	**Quiz II**	**Assignment**
		35	35	5	5	10

Minimum marks [Courses of I to VIII semesters] to be scored by the student in CIE is 50% of maximum marks

Evaluation Scheme-SEE				
Weightage	**Max. Marks**	**Scheme of SEE Question Paper**		
50%	100	**Duration: 3Hrs.**	**Questions to Set: 10**	**Questions to Answer: 5**

- Each of the two full questions set / unit shall be so comprehensive as to cover the entire contents of the unit.
- There will be direct choice between the two questions within each Unit
- Total questions to be set are 10. All full questions carry equal marks of 20
- The no. of subdivisions in each main question shall be limited to three only
- No. of questions to be answered by students is 5 full questions.

Minimum marks [Courses of I to VIII semesters]to be scored by the student is 40% of maximum marks.

Note: Evaluation for MLC Courses will be based on an assignment and CIE for 50 marks and not on the basis of Semester End Examination (SEE).

P.E.S. COLLEGE OF ENGINEERING, MANDYA
(An Autonomous Institution)
Scheme of Teaching and Examination

III Semester B.E. (XXX)

Sl. No.	Course Code	Course Title	Teaching Dept.	Hrs/Week L:T:P:H	Total Credit	Examination Marks		
						CIE	SEE	Total
1.	P17MAT31	Core Course I – Engineering Mathematics-III	Maths	3:2:0:5	4	50	50	100
2.	P17xx32	Core Course II	XXX	4:0:0:4	4	50	50	100
3.	P17xx33	Core Course III	XXX	4:0:0:4	4	50	50	100
4.	P17EC34	Core Course IV	XXX	4:0:0:4	4	50	50	100
5.	P17xx35	Core Course V	XXX	4:0:0:4	4	50	50	100
6.	P17xx36	Core Course VI	XXX	4:0:0:4	3	50	50	100
7.	P17xxL37	Laboratory I	XXX	0:0:3:3	1.5	50	50	100
8.	P17xxL38	Laboratory II	XXX	0:0:3:3	1.5	50	50	100
9	P17HU**DIP**39	Comprehensive Communication Development(CCD)	HS & M	2:0:0:2	[2]	[50]	[50]	[100]
10	P17HU39	**Aptitude and Reasoning Development - BEGINNER (ARDB)	HS&M	2:0:0:2	0	(50)	--	--
12	P17HU**DIP**310	* Indian Constitution, Human Rights & Professional Ethics	Human& Science	2:0:0:2	0	--	---	---
13	P17MA**DIP**31	*Additional Maths-I	Maths	4:0:0:4	0	--	---	---
Total					26[28]	400[450]	400[450]	800[900]

*** Additional Mathematics-I & Constitution of India and Professional Ethics : Lateral entry students shall have to pass these mandatory learning courses before completion of VI- Semester**
**** ARDB: All students shall have to pass this mandatory learning courses before completion of VI- Semester**

P.E.S. COLLEGE OF ENGINEERING, MANDYA
(An Autonomous Institution)
Scheme of Teaching and Examination

IV Semester B.E. (XXX)

Sl. No.	Course Code	Course Title	Teaching Dept.	Hrs/ Week L:T:P:H	Total Credit	Examination Marks		
						CIE	SEE	Total
1.	P17MAAC41^{+}/ P17MAES41^{++}	Core Course I – Engineering Mathematics-IV	Maths	3:2:0:5	4	50	50	100
2.	P17xx42	Core Course II	XXX	4:0:0:4	4	50	50	100
3.	P17xx43	Core Course III	XXX	4:0:0:4	4	50	50	100
4.	P17xx44	Core Course IV	XXX	4:0:0:4	4	50	50	100
5.	P17xx45	Core Course V	XXX	4:0:0:4	4	50	50	100
6.	P17xx46	Core Course-VI	XXX	4:0:0:4	3	50	50	100
7.	P17xxL47	Laboratory I	XXX	0:0:3:3	1.5	50	50	100
8.	P17xxL48	Laboratory II	XXX	0:0:3:3	1.5	50	50	100
9	P17HU49	Aptitude and Reasoning Development – Intermediate (ARDI)	HS&M	2:0:0:2	1	50	50	100
10	P17EV**DIP**410	*Environmental Studies	ENV	2:0:0:2	0	--	--	--
11	P17MA**DIP**41	*Additional Maths-II	Maths	4:0:0:4	0	--	--	--
Total					27	450	450	900

*** Additional Mathematics-II & Environmental Studies: Lateral entry students shall have to pass these mandatory learning courses before completion of VI- Semester**

$^{+}$ Common to BE (AU, CV, ME and I&PE)
$^{++}$ Common to BE (CS, EC, E&E and IS&E)

P.E.S. COLLEGE OF ENGINEERING, MANDYA
(An Autonomous Institution)
Scheme of Teaching and Examination

V Semester B.E. (XXX)

Sl. No.	Course Code	Course Title	Teaching Dept.	Hrs/Week L:T:P:H	Total Credit	Examination Marks		
						CIE	SEE	Total
1.	P17xx51	Core Course I	xxx	4:0:0:4	4	50	50	100
2.	P17xx52	Core Course II	xxx	4:0:0:4	4	50	50	100
3.	P17xx53	Core Course III	xxx	4:0:0:4	4	50	50	100
4.	P17xx54	Foundation Course-I	xxx	4:0:0:4	4	50	50	100
5.	P17xx55	Foundation Elective	xxx	4:0:0:4	3	50	50	100
6.	P17xx56X	Elective-I	xxx	4:0:0:4	3	50	50	100
7.	P17xxL57	Laboratory I	xxx	0:0:3:3	1.5	50	50	100
8.	P17xxL58	Laboratory II	xxx	0:0:3:3	1.5	50	50	100
9.	P17xx59	Industry Visit & Interaction	xxx	0:0:2:2	1	50	--	50
10.	P17xx510	Aptitude and Reasoning Development –Advanced. (ARDA)	HS&M	2:0:0:2	1	50	50	100
Total					27	500	450	950

List of Electives

Foundation Elective			**Elective - 1**		
Sl. No	Course Code	Course title	Sl. No.	Course Code	Course title
1.	P17xx551	Foundation Elective-I- 1	1.	P17xx561	Elective I- 1
2.	P17xx552	Foundation Elective-I- 2	2.	P17xx562	Elective I- 2
3.	P17xx553	Foundation Elective-I- 3	3.	P17xx563	Elective I- 3
4.	P17xx554	Foundation Elective-I- 4	4.	P17xx564	Elective I- 4

P.E.S. COLLEGE OF ENGINEERING, MANDYA
(An Autonomous Institution)
Scheme of Teaching and Examination

VI Semester B.E. (XXX)

Sl. No	Course Code	Course Title	Teaching Dept.	Hrs/Week L:T:P:H	Total Credit	Examination Marks		
						CIE	SEE	Total
1.	P17xx61	Core Course I	xxx	4:0:0:4	4	50	50	100
2.	P17xx62	Core Course II	xxx	4:0:0:4	4	50	50	100
3.	P17xx63	Core Course III	xxx	4:0:0:4	4	50	50	100
4.	P17xx64	Foundation Course-II	xxx	4:0:0:4	4	50	50	100
5.	P17xx65X	Elective-II	xxx	4:0:0:4	3	50	50	100
6.	P17xxL66X	Elective-III	xxx	4:0:0:4	3	50	50	100
7.	P17xxL67	Laboratory I	xxx	0:0:3:3	1.5	50	50	100
8.	P17XX68	Laboratory II	xxx	0:0:3:3	1.5	50	50	100
9.	P17xx69	Mini Project	xxx	0:0:2:2	1	50	--	50
10.	P17xx610	Aptitude and Reasoning Development – Expert(ARDE)	HS&M	2:0:0:2	1	50	50	100
Total					27	500	450	950

List of Electives

Elective-II			**Elective - III**		
Sl. No	Course Code	Course title	Sl. No.	Course Code	Course title
1.	P17xx651	Elective-II- 1	1.	P17xx661	Elective III - 1
2.	P17xx652	Elective-II- 2	2.	P17xx662	Elective III - 2
3.	P17xx653	Elective-II- 3	3.	P17xx663	Elective III - 3
4.	P17xx654	Elective-II- 4	4.	P17xx664	Elective III - 4

P.E.S. COLLEGE OF ENGINEERING, MANDYA
(An Autonomous Institution)
Scheme of Teaching and Examination

VII Semester B.E. (XXX)

Sl No.	Course Code	Course Title	Teaching Dept.	Hours Pattern L:T:P:H	Total Credit	Examination Marks		
						CIE	SEE	Total
1.	P17xx71	Core Course I	xxx	4:0:0:4	4	50	50	100
2.	P17xx72	Core Course II	xxx	4:0:0:4	4	50	50	100
3.	P17xx73	Core Course III	xxx	4:0:0:4	4	50	50	100
4.	P17xx74X	Elective-IV	xxx	4:0:0:4	3	50	50	100
5.	P17xx75X	Open Elective-I	xxx	4:0:0:4	3	50	50	100
6.	P17xxL76	Laboratory I	xxx	0:0:3:3	1.5	50	50	100
7.	P17xxL77	Laboratory II	xxx	0:0:3:3	1.5	50	50	100
8.	P17xx78	Project Work Phase - I	xxx	0:0:4:2	2	--	50	50
				Total	23	350	400	750

List of Electives

Elective - 4			**Open Elective - 1**		
Sl. No.	Course Code	Course title	Sl. No.	Course Code	Course title
1.	P17xx741	Elective 4-1	1.	P17xx751	Open Elective 1-1
2.	P17xx742	Elective 4-2	2.	P17xx752	Open Elective 1-2
3.	P17xx743	Elective 4-3	3.	P17xx753	Open Elective 1-3
4.	P17xx744	Elective 4-4	4.	P17xx754	Open Elective 1-4

P.E.S. COLLEGE OF ENGINEERING, MANDYA
(An Autonomous Institution)
Scheme of Teaching and Examination

VIII Semester B.E. (XXX)

Sl No.	Course Code	Course Title	Teaching Dept.	Hours Pattern L:T:P:H	Total Credit	Examination Marks		
						CIE	SEE	Total
1.	P17xx81	Core Course I	xxx	4:0:0:4	3	50	50	100
2.	P17xx82X	Elective-V	xxx	4:0:0:4	3	50	50	100
3.	P17xx83X	Elective-VI	xxx	4:0:0:4	3	50	50	100
4.	P17xx84	Open Elective-II	xxx	4:0:0:4	3	50	50	100
5.	P17xx85	Project Work Phase - II	xxx	0:0:16:16	8	50	100	150
6.	P17xx86	Self study course & Seminar	xxx	0:0:2:2	2	50	--	50
				Total	22	300	300	600

List of Electives

Elective - 5			**Elective - 6**			**Open Elective - 2**		
Sl. No.	Course Code	Course title	Sl. No.	Course Code	Course title	Sl. No.	Course Code	Course title
1.	P17xx821	Elective 5-1	1.	P17xx831	Elective 6-1	1.	P17xx841	Open Elective 2-1
2.	P17xx822	Elective 5-2	2.	P17xx832	Elective 6-2	2.	P17xx842	Open Elective 2-2
3.	P17xx823	Elective 5-3	3.	P17xx833	Elective 6-3	3.	P17xx843	Open Elective 2-3
4.	P17xx824	Elective 5-4	4.	P17xx834	Elective 6-4	4.	P17xx844	Open Elective 2-4

1. **Core Course:** This is the course which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.

2.
   a. **Foundation Course:** The course based upon the content that leads to Knowledge enhancement.

   b. **Foundation Elective:** Elective Foundation courses are value-based and are aimed at man-making education.

3. **Elective:** This is the course, which can be chosen from the pool of papers. It may be supportive to the discipline / providing extended scope/ Enabling an Exposure to some other discipline domain / nurturing student proficiency skills.

4. **Self Study Course and Seminar**: The courses related to the program discipline which is studied by the students with her/his own efforts under the guidance of a Course Instructor/Project guide, using study materials available in open sources. The intention of the course is to encourage the habit of self learning. Such courses may be devised with the guidance of Course Instructor/Project guide and introduced during **8th** Semesters of Bachelors of Engineering program. It shall carry two credits.

   The Assessment marks (CEE) shall be based on the evaluation during 8th semester by a committee consisting of Head of the concerned department, two senior faculty members of the department, one of them may be the internal guide. The work may be evaluated for award of Assessment marks (CEE) based on a Report, presentation and viva voce, by the committee.

5. **Open Elective**: The course offered by a competent department/discipline of specialization in order to help a candidate of any other discipline to gain knowledge and reasonable extent of expertise in an area, wherein the student wishes to acquire some support for development in either of his own academic or research interests, etc. As such the course content shall be simple enough to be understood by interdisciplinary candidates. An Open Elective will be offered by a hosting department, to other departments in a given semester. Such a course shall be introduced during 7th and 8th Semester of Bachelors Program. (10-12 Courses/Semester shall be offered to other disciplines from 5 hosting streams [CS, CE, E & E, ME, MBA/MCA] having an elementary Syllabus designed).

6. **Self study component**:
   - Self study component shall be the additional part of each unit and must not be included in the actual content of five units syllabus.
   - Assignment shall be reduced to 5 marks from 10 marks and the remaining 5 marks shall be part of the self study component
   - The self study component evaluation process is based on the type of content in the course which may be finalised based on either program execution/ Hardware demonstration/ seminar/ viva voce. It shall be considered for only CIE.

List of Courses Pertaining to Mandatory Learning, Soft Skills & Personality Development, Industry Institute Interaction and Mini Project

Mandatory Learning Courses (MLC) & one credit courses of BE Program (2015-16)									
Sl. No.	**Sem**	**Course Code**	**Title**	**Credits**	**Sl.. No.**	**Sem**	**Course Code**	**Title**	**Credits**
1.	I & II	P17HU18	Effective Communication Development. (ECD)	1	10.	IV	P17HU49	Aptitude and Reasoning Development – INTERMEDIATE (ARDI)	1
2.		P17HU28	Professional Communication Development(PCD)	1	11.		P17MADIP41	Additional Maths-II	0
3.		P17EV19/29	Environmental Studies	0	12.		P17EVDIP410	Environmental Studies	0
4.		P17HM110/210	Language (Kan.)	0	13.	V	P17xx59	Industry Interaction	1
5.		P17HM19/29	Indian Constitution, Human Rights& Professional Ethics(ICHRPE)	0	14.		P17xx510	Aptitude and Reasoning Development – Advanced. (ARDA)	1
6.	III	P17HU39	Aptitude and Reasoning Development - BEGINNER (ARDB)	0	15.	VI	P17xx610	Aptitude and Reasoning Development – Expert(ARDE)	1
7.		P17MADIP31	Additional Maths-I	0	16.		P17HU69	Mini Project	1
8.		P17HUDIP39	Comprehensive Communication Development(CCD)	[2]					
9.		P17HMDIP310	Indian Constitution, Human Rights& Professional Ethics(ICHRPE)	0					

Guidelines proposed for the conduction and evaluation of the **Industry Interaction** and **Mini Projects (**One credit courses**)** are as follows-

1. Industry Interaction:

a) To provide minimum of two activities, such as Industry/Field visit, Technical talk/Seminar during V semesters.
b) Two faculty members shall be assigned as Coordinators for arranging and monitoring the industry related activities.
c) Student shall submit a write up on the activities attended/held during the semester, (minimum of 10 A4 pages).
d) The Internal Assessment marks (CIE) shall be based on the evaluation as per the guidelines at the end of the semester by a committee consisting of Head of the concerned department, two senior teachers of the department, one of them may be the internal guide.

2. Mini Projects:

a) To provide 2hrs/week for Mini Projects during VI Sem BE programs.
b) Mini Projects shall comprise of an exercise assigned to a batch of students similar to major projects.
c) The topics may be related to technological, sociological issues.
d) A report (not less than 20 A4 pages) to be submitted, detailing the solution to the problem/concept worked out during the semester.
e) The work may be evaluated for award of Internal Assessment marks (CIE) based on a presentation/demonstration and viva voce, by a committee coordinated by the Course coordinators.

PROJECT WORK

1. The Project Work (Phase I+ Phase II) carries 10 credits (2 credits+8 credits) and spreads over TWO semesters, i.e. during 7th and 8th semesters. The topic and title of the project shall be chosen by the candidate in consultation with the guide and co-guide (if any) during the seventh semester itself. However, modification of only the title but not the field of work is permitted at the time of final submission of project report during the eighth semester.
2. The project work shall be carried out by candidate(s) independently/in a group (maximum of four) during the seventh and eighth semester under the guidance of one of the faculty members of the Department of study. If the project work is of inter-disciplinary nature, a co-guide shall be taken from the same or any other relevant Department. If a project work has to be carried out in any industry / factory / organization, outside the campus, the permission for the same and the name of co-guide at any of these organizations shall be intimated to the authorities at the beginning of seventh semester by the Head of the Department.
3. The weekly progress of the Project work shall be monitored and reviewed by the Project Guide assigned by DUGC. The method of evaluation, including intermediate assessment shall be evolved by the pertinent DUGC.
4. The extent of work (mandatory) to be completed for Project Work - Phase I is synopsis, Introduction, Literature survey, Objective and Methodology of the approved Project work.
5. The Assessment marks (SEE) in the case of Project Work - Phase I, shall be based on the evaluation at the end of the 7th semester by a committee consisting of Head of the concerned department, two senior faculty members of the department, one of them may be the internal guide. The work may be evaluated for award of Assessment marks (SEE) based on a Report [comprising of synopsis, Introduction, Literature survey, Objective and Methodology], presentation and viva voce, by the committee.
6. A candidate shall submit N+3 (No. of candidates+3) copies of the Report of the Project Work to Head, DUGC on or before the specified date. The report shall be in the format prescribed by the Institute. The candidate shall submit a report of the project work (dissertation) duly approved by the guide and co-guide. The project report shall be countersigned by the guide, co-guide (if any) and the Head of the Department
7. The last date for the submission of Report shall be Two weeks before the closure of the semester in which the project work credits have been registered for and is expected to be completed or as announced by the COE. The date of submission of the dissertation may be extended up to a maximum of eight academic years, from the date of commencement of the first semester in which the candidate has taken admission to the course.
8. The final evaluation (CIE & SEE) for Project Work - Phase II is done by a Project Work Evaluation Committee (PWEC) constituted by the pertinent DUGC. There shall be an open seminar followed by a viva – voce examination as part of the final evaluation. After the final evaluation, appropriate letter grade is awarded.
9. If in the opinion of the PWEC, the Project Report is acceptable with minor modifications for the minimum passing grade ‘E’(Fair) in the case of project, the PWEC shall value and instruct the candidate suitably to incorporate the necessary modifications and to resubmit it to the Chairman, PWEC. After such resubmission, the Chairman, PWEC will certify that the necessary modification has been incorporated.
10. The title of the Project Report shall be indicated in the Student Progress Report.
11. The Assessment marks in case of Project Work - Phase II and seminar shall be based on the evaluation, as per the guidelines, at the end of the 8th semester by a committee consisting of Head of the concerned department, two senior faculty members of the department (one of them may be the internal guide).
12. The Assessment marks sheet shall bear the signature of all those concerned, along with the date and seal of the Principal.

First and Second Semester Syllabus

Academic Year 2017-18

Department of Mathematics

About the Department:

The Department was started in the year 1962. Currently the Department has **08** teaching faculty and **01** supporting staff. It has an established research centre under University of Mysore and VTU, Belagavi with **02** research guides and presently there are 09 research scholars. So far **03** candidates have been awarded Ph. D. degree. During the last five years, the Department has published **40** papers in international and **20** papers in national journals. The Department's prides itself in hosting **02** national seminars/ workshops.

The Department has good supporting Non-teaching staff. There is good synergy between the teaching and non-teaching faculty.

Vision:- Department of high repute to develop innovative and humane engineers by imparting mathematical proficiency to address scientific and engineering challenges.

Mission:- Committed to

- Develop competent faculty towards conveying best in class teaching and learning.
- Facilitate inter disciplinary faculty development and research.
- Nurture qualities of computation and mathematical skills for solving engineering and technological problems.
- Mould students with value based education to improve their intrinsic standards

Short Term Goals:

- To apply for research projects under UGC/DST grants.
- To host a national conference on 'Recent Trends in Applied Mathematics'.
- To conduct a training programme for faculty of Mathematics in PU level Institutions and Engineering college.

Mid Term Goals:

- To establish Numerical Mathematical Lab for M.Tech/Research students.
- To cater needs of UG/PG and research students by providing required elective courses.

Long Term Goals:

- To host a international conference on Mathematical Applications in Engineering and Technology.
- To undertake curriculum revision for UG/PG programmes, periodically.

Course Title: Engineering Mathematics-I			
Course Code:P17MA11	**Sem: I**	**L-T-P-H: 3-2-0-5**	**Credits - 4**
Contact Period: Lecture: 52Hrs., Exam: 3 Hrs		**Weightage: CIE:50; SEE:50**	

Prerequisites: The student should have acquired the knowledge of elementary Mathematical tools including that of PUC (10+2) level

Course Learning Objectives (CLO's)

At the end of the course, the student should be able to:

I. Explain the process of successive differentiation, nature of polar curves and, use these concepts to find different parameters,

II. Solve indeterminate form and Expand a function in a power series using Taylor's and Maclaurin's series and understand their scientific/engineering importance.

III. Introduction of partial differentiation and the concept of partial differentiation to find the derivatives of implicit and composite functions Analyse the practical importance of vector

differentiation in understanding the gradient, divergence and curl, and their applications in engineering courses.

IV. Derive reduction formula and Trace the curves in cartesian and polar coordinates, use the idea of integration to find the length, area, surface area, volume of a solid of revolution of plane curves.

V. Model differential equations of physical situation, various exact/analytical methods of solving them and applications of orthogonal trajectories, Newton's law of cooling, L-R circuits, growth and decay etc. and physical interpretation of the solutions.

b) Relevance of the Course:

Engineering Mathematics- I is a fundamental course for all branches in BE program, that builds knowledge in understanding the allied engineering courses such as applied mechanics, electronic fundamentals, elements of electrical/mechanical engineering science etc., by applying appropriate mathematical concepts of differentiation, integration, vector differentiation and first order differential equations.

Course Content

Unit – I

Successive differentiation - Simple problems related to algebraic rational and trigonometric functions, Leibnitz's theorem (without proof)-Problems only.

Polar curves- angle between the radius vector and the tangent - pedal equation (for polar curves)-problems only. Derivatives of arcs, curvature and radius of curvature- Cartesian, parametric, polar and pedal forms (No derivation)-examples only. **10 hrs**

Self study component-Introduction and formulae for n^{th} derivative of standard functions

Unit – II

Rolle's theorem and Lagrange's mean value theorem (statements only) Geometrical interpretation- Illustrative examples, Cauchy's mean value theorem.

Taylor's theorem for a function of a single variable and Maclaurin's series expansions (statements only) – Illustrative examples. Indeterminate forms -L'Hospital's rule (without proof). **10 hrs**

Self study component- Introduction and evaluation of indeterminate forms.

Unit – III

Partial differentiation-Illustrative examples. Euler's theorem for homogeneous functions of two variables (No proof-problems only). Total derivatives-differentiation of composite and implicit functions-Problems.

Vector differentiation: Differentiation of vector/scalar point functions. Velocity and acceleration of a particle moving on a space curve. Gradient of a scalar point function, directional derivative - Problems only. Divergence and curl, solenoidal and irrotational vector fields-Problems only. **12 hrs**

Self study component- Introduction and elementary problems on partial differentiation.

Unit – IV

Reduction formulae for $\cos^n x$, $\sin^n x$ and $\sin^m x \cos^n x$ and evaluation of these with standard limits. Tracing of curves and its applications connected with standard curves viz., Cissiod, Astroid, Cycloid and Cardioid.

Applications of integration to area, length of a given curve, volume and surface area of solids of revolution. Differentiation under integral sign (integrals with constant limits).

Self study component- Reduction formulae for $\tan^n x$, $\cot^n x$, $\operatorname{cosec}^n x$, $\sec^n x$ and simple problems. Tracing of curves –Witch of agnesi, Strophoid, Lemniscate of Bernulli **10 hrs**

Unit – V

Introduction to ordinary differential equations (ODE's)-solutions of first order and first degree differential equations: homogeneous**,** exact, linear differential equations of order one and equations reducible to above types (weightage for reducibility).

Applications of first order and first degree ODE's - Orthogonal trajectories of Cartesian and polar curves. Newton's law of cooling, simple R-L circuits and Laws of decay and growth-Illustrative examples from engineering field. **10 hrs**

Self study component- Solution of ODE by Variable separable –Simple problems.

Text Books

1. B. S. Grewal: Higher Engineering Mathematics, 42nd Edition- 2012, Khanna Publishers, New Delhi.
2. Engineering Mathematics: - N. P. Bali and Manish Goyal, Laxmi Publications, 7th Edn., 2007.

Reference Books:

1. Advanced Engineering Mathematics: - E. Kreyszig, John Wiley & Sons, 9th Ed.2011
2. Engineering Mathematics: Vol.-I & II: - S. S. Sastry, Prentice-Hall of India, 4th Ed.

Course Outcomes (Course Learning Outcomes) (COs)

At the end of the course, the student should be able to

1. Obtain the nth derivative, Define the nature of polar curves and solve the problems on polar curves and obtain the radius of curvature.
2. Explain mean value theorems and evaluate the indeterminate form and power series using Taylor's and Maclaurin's series.
3. Differentiate the function of several variable differentiate the composite function. Evaluate the vector differentiation.
4. Evaluate some standard integrals by applying reduction formula and solve applications problems.
5. Solve differential equations of first order and solve application oriented problems.

Department of Physics

About the department

Physics department is one of the oldest departments of PES College of Engineering, Mandya, established in the year 1962. It is located in the first floor of the Administrative Block. The department has very good infrastructure with a carpet area of 320 sq.m consisting of two spacious laboratories, HOD's chamber, two staff rooms, a departmental library, an internet room and a store room. The entire department is newly renovated with modern amenities and the laboratories are well established with latest & modern equipments. The department offers Engineering Physics Theory and Laboratory courses for the First year B.E students of all branches. The Department has been getting excellent results both in theory and practical examinations.

The department has five faculty out of which one Professor, one Associate Professor and three Assistant Professors. Among them two faculties have Ph.D. degree specialized in different fields of Physics. The department is recognized for research in Physics under PET research center affiliated to University of Mysore, Mysuru and VTU Belagavi. Dr. Shivalinge Gowda, Professor and HOD of the department and Dr. T. S. Shashikumar, Assistant Professor are involved in research activities.

The department has good supporting Non-teaching staffs with one Assistant Instructor, one Mechanic and two Helpers. There is good synergy between the teaching and non-teaching faculty.

Vision:

Department of excellence imparting strong foundation in Applied Physics for developing competent technocrats.

Mission:

Committed to:

1) Develop competent and committed faculty in the light of outcome based education.
2) Motivate and encourage the students to gain scientific temperament and creativity through interactions among faculty and students.
3) Provide strong theoretical foundation complemented with extensive practical training to achieve excellence.

Short Term Goals:

- ☆ Academic performance excellence in basic sciences
- ☆ Guest lecturers/seminars from eminent faculty
- ☆ Faculty development programmes
- ☆ Project proposals and fund raising

Mid Term Goals:

- Modernization of Physics labs
- Conducting National conference
- Establishment of research centre

Long Term Goals:

- ♦ Inter disciplinary research activities
- ♦ Establishing centre of excellence

Course Title: Engineering Physics			
Course Code: P17PH12/22	**Sem: I/II**	**L-T-P-H: 4 - 0 - 0-4**	**Credits: 4**
Contact Period: Lecture: 52 Hr, Exam: 3 Hrs.	**Weightage: CIE: 50; SEE: 50 Marks**		

Prerequisites (PR): The student should have acquire knowledge of Basic laws, theories, phenomenon, definitions, expressions, advanced research information and techniques required to work with materials and material sciences. Engineering Physics combines basic engineering classes with fundamental physics courses. The course provides a more thorough founding in applied physics of an area chosen by the student.

Course Learning Objectives (CLOs):

1) Give the learning in elastic properties of materials and their applications in engineering field.
2) Give the learning of phenomenon of electrical polarization and dielectrics & the effect of external electrical field on dielectric materials.
3) Develop the basics of Quantum theory through Group and phase concepts. Dual nature of matter and matter waves.
4) Develop the implications of Quantum theory like Heisenberg's uncertainty principle, probabilistic nature of wave functions and discretisation of energy levels in potential well.
5) Develop the implications of Quantum theory on the classical free electron theory and introduces the concept of Fermi energy through the Fermi Dirac statistics.
6) Develop the concept of motion of the charge carriers in an intrinsic semiconductor through the band theory of solids.
7) Gives the insight into the change in the physical properties at Nano level in relation to the Bulk.

8) Explain the phenomenon of superconductivity and its applications through different effects like Meissner's effect, isotopic effect, BCS theory, Josephson's effect.
9) Give a basic account of the functioning of laser systems and functioning of semiconductor laser with applications.
10) Explain their propagations of light through the optical fiber and the applications of optical fibers as the communication systems and sensors.
11) Explain production and applications of ultrasonic waves through a medium and its Non-destructive applications.
12) Give the basic requirements for acoustics of buildings and factors affecting the architectural acoustics with their remedies.

Course Content

Unit – I : Elastic and Dielectric properties of Materials :

a) Elastic properties of materials: Elasticity, relationship between modulli (qualitative) and Poisson's ratio, stress-strain diagram, bending of beams – bending moment, expression for Young's modulus - uniform bending (theory), applications; I-shaped girders, problems.

b) Dielectric properties of Materials: Electric dipole, dipole moment, Dielectric constant and polarization of dielectric materials. Types of polarization. Relative permittivity. Piezoelectricity, Ferroelectricity. Equation for internal fields in liquids and solids (one dimensional). Clausius-Mossotti equation. Dielectric losses. Important applications of dielectric materials. Problems. **10 hrs**

Self study component: Rigidity modulus by torsional pendulum

Unit – II : Modern Physics and Quantum Mechanics :

a) Modern Physics: Black body radiation spectrum. Statements of Wien's law, Rayleigh-Jean's law, Stefan-Boltzmann's law and Planck's law (Qualitative). Wave-Particle duality, deBroglie concept of matter waves and their characteristic properties, Phase velocity, Group velocity and Particle velocity, Relation between them. Expression for deBroglie wavelength using group velocity concept, Problems.

b) Quantum Mechanics: Heisenberg's uncertainty principle. Applications of uncertainty principle (Non-existence of electrons in the nucleus). Wave function, properties, Physical significance of wave function, Probability density and Normalization of wave functions. Time-independent one dimensional Schrodinger wave equation. Applications of Schrodinger wave equation to particle trapped in a one dimensional square potential well (derivation of energy Eigen values and Eigen function) Problems. **10 hrs**

Self study component: Reduction of Rayleigh-Jeans law and Wein's law from Planck's law.

Unit – III : Electrical Conductivity in Metals and Semiconductors :

a) Electrical Conductivity in Metals: Classical free-electron theory - Free electron concept – Merits & Demerits, Explain failure of classical free electron theory, Quantum free electron theory – Assumptions. Fermi-Dirac Statistics. Fermi-energy, Fermi factor, Fermi velocity, Fermi temperature. Variation of Fermi factor with Energy and temperature. Density of states (derivation). Merits of quantum free-electron theory. Problems.

b) Semiconductors: Introduction, Band theory of Solids and Classification of materials (qualitative approach), Classification of Semiconductors, Fermi level in intrinsic and extrinsic semiconductors. Concentration of charge carriers and conductivity (derivation) in intrinsic semiconductors. Law's of mass action for semiconductors. Relation between E_F & E_g and expression for intrinsic carrier concentration of an intrinsic semiconductors Problems. **10 hrs**

Self study component: Variation of resistivity in metals and Semiconductors with temperature.

Unit – IV : Nano Science & Technology and Superconductivity:

a) Nano Science & Technology: Length scales, variation of physical properties from bulk to thin films to nanomaterials, confinement of electron energy states (DOS) in 0-D, 1-D, 2-D, and 3-D systems (qualitative approach), Surface area to Volume ratio, size, shape and assembly effects. Example: Carbon nanotubes, properties and applications of nanomaterials, Scanning Tunneling Microscope (STM) (qualitative).

b) Superconductivity: Introduction, properties of superconductors - critical currents, Meissner's effect, Isotopic effect, BCS theory. Temperature dependence of resistivity in superconductors. Types of Superconductors (Type-I and Type-II). Josephson's effect. Effect of magnetic field (Temperature dependence of critical field). High temperature superconductors. Applications of superconductivity – i) Superconducting magnets ii) Maglev vehicle and iii) SQUIDS. Problems. **10 hrs**

Self study component: Scanning Electron Microscope (SEM)

Unit – V : Lasers, Optical Fibers, Ultrasonics & Acoustics:

a) Lasers: Characteristics of lasers, absorption, spontaneous and stimulated emission of radiation, Einstein coefficients and relation between them. Requirements of lasing systems: metastable state, population inversion and laser cavity. Construction and working of Semiconductor diode laser. Engineering applications of lasers: welding, drilling & cutting.

b) Fiber Optics: Principles of optical fiber, Angle of acceptance, Numerical aperture (derivation) and Fractional Index change. Types of Optical fibers [single mode, multi mode & Graded Index Multimode (GRIN)]. Applications: Fiber optic telecommunication, Problems.

c) Ultrasonics: Introduction, Non-destructive method of testing the materials. Measurement of ultrasonic velocity in solids and liquids. Determination of elastic constants in solids and liquids, Applications of ultrasonics. Problems.

d) Acoustics: Basic requirements of the acoustically auditorium, reverberation and time of reverberation, Sabine's formula for reverberation time (No derivation), absorption coefficient, factors affecting the architectural acoustics and their remedies. **12hrs**

Self study component: Applications of LASER in atmospheric pollutant analysis, Fiber optic telecommunication.

Text Books

1. John Wiley : Engineering Physics (Wiley Precise Textbook Series - 2014) - Wiley India Pvt. Ltd, New Delhi.
2. R.K. Gaur, S. L. Gupta ; Engineering Physics – Dhanpat Rai Publications; 2011 Edition

References

1. S. O. Pillai : Solid State Physics, (New Revised Sixth Edition) – New Age International (P) Limited, Publishers, New Delhi – Bangalore.
2. B. Basavaraj & P. Sadashiva : Engineering Physics - Omkar Publications, Bangalore
3. N.H. Ayachit, P. K. Mittal: Engineering Physics – I. K. International Publishing House Pvt. Ltd. New Delhi – Bangalore.
4. M.N. Avadhanulu and P.G. Kshirsagar; Engineering Physics – S Chand & Company Ltd., Ram Nagar, New Delhi.

Course Outcomes (Course Learning Outcomes) (COs)

At the end of the course the students should be able to:

CO1 - **Explain** the basics of elastic properties of material and some of their engineering applications; to understand dielectrics on the basis of polarization.

CO2 - **Comprehend** the basics of Quantum Mechanics and Black body radiations which **explain** the discretisation of energy levels.

CO 3 - **Explain** the basic electrical properties of materials namely, the conductivity in metals, semiconductors & effect of electric field on dielectric materials.

CO 4 - **Give an account** of basics of Nano Science and Nano Technology & Superconductivity with the underlining principles.

CO 5 - **Apply basic concepts** of Lasers, Optical fibers, Ultrasonics & Acoustics in the field of industry, medicine, telecommunication and engineering applications.

Department of Chemistry

About the Department:

Department of Chemistry was established during the year 1962 and staff pattern of Department of Chemistry consists of one Professor, one Associated Professor and three Assistant professors are working in the Department. Among them three staff members got Ph.D. degree and other two are having M.Sc. degree. Non–teaching faculty of the department consists of one Asst. instructor, one mechanic and three helpers. Department of Chemistry have well equipped laboratory with area of about 4500 sq. ft. In this laboratory 30-35 students are accommodated per batch. The laboratory consists of one preparation room, one store room, one instrument room and four staff rooms. Department of Chemistry has been conducted one AICTE short–term course for engineering college staff members on Energy systems during the year 1999. Department of Chemistry has been upgraded as per autonomous syllabus under VTU and research lab by the help of AICTE grant of Rs. 7.0 lakhs. It has been recognized as research center by University of Mysore, Mysore and VTU Belagavi. The staff members are guiding the students of B.E and M.Tech, for project and research works. Staff members have been published 37 research papers at National and International Journals and also presented 50 research papers at National and International Conferences/Symposia. One Ph.D degree is awarded in Chemistry on corrosion science from the University of Mysore, Mysore during the year 2016 under the guidance of Dr.H.Ramachandra Professor and Head. Six candidates are doing research work under the guidance of staff members. Also the Department has provided necessary Library, computers with internet facilities.

Vision

Foundation of excellence imparting best teaching-learning solutions in Engineering Chemistry towards developing competent professionals.

Mission

Committed to:

1. Develop competent and committed faculty in the light of outcome based education.
2. Motivate and encourage the students to gain scientific knowledge and creativity in Engineering Chemistry.
3. Provide strong theoretical foundation complemented with extensive practical training.

Short Term Goals:

- ☆ Academic performance excellence in basic sciences
- ☆ Guest lecturers/seminars from eminent faculty
- ☆ Faculty development programmes
- ☆ Project proposals and fund raising

Mid Term Goals:

- Modernization of Chemistry lab
- Conducting National conference
- Establishment of research centre

Long Term Goals:

- Inter disciplinary research activities
- Establishing centre of excellence

Course Title: Engineering Chemistry			
Course Code:P17CH12/22	**Sem: I / II**	**L-T-P-H: 4-0-0-4**	**Credits: 4**
Contact Period: Lecture: 52 Hr, Exam: 3 Hrs.		**Weight age: CIE:50; SEE:50**	

Prerequisites

Chemistry is one of the vital branches of science without which life does not exist. The student should have acquire knowledge of basic laws, theories, phenomenon, definitions expressions, advanced research informations and techniques are required to work with material sciences. Engineering is the application of basic sciences and it may be noted that all engineering branches originated from basic sciences. "Science without technology is useless and technology without science is blind". Therefore the knowledge of science is very essential for engineering students.

Course Learning Objectives (CLOs)

The course aims to

1) Understand the importance of chemical energy and phase rule.
2) Determination of calorific values of fuels and their problems.
3) Explain the electrodes, electro-chemical cells and battery and their importance.
4) Construction, working and applications of commercial battery.
5) Define corrosion, types, mechanism and prevention of corrosion.
6) Importance of metal finishing in engineering as well as medical applications.
7) Synthesis of engineering plastics, laminates, elastomers and adhesives.
8) The use of cement and lubricants for the engineering field.
9) Study of liquid crystals, types and applications in the field of electronics.
10) Need of understanding nano-science and it's importance in Engineering & medical fields.
11) Apply the knowledge of water technology for purification and treatments of water.
12) Awareness about water and air pollution for the students and publics.

Course Content (CC)

Unit – I

Unit – I: Chemical Energy Sources and Phase rule:

Chemical Energy: Introduction, Fuels-Definition, classification. Calorific value - definition, Gross and Net calorific values. Determination of calorific value of solid and liquid fuels by Bomb calorimeter and gaseous fuel using Buoy's calorimeter, numerical problems. Cracking -fluidized bed catalytic cracking, Reformation of petrol. Knocking-mechanism, ill effects, prevention of knocking, anti-knocking agents, leaded and unleaded petrol, Octane and Cetane number.

Phase rule: Introduction Statement, terms involved – explanation with examples. Applications of phase rule to single component system-water system, two component system: lead-silver system and desilverisation of lead by Pattinson's process. **10 hrs**

Self-study component: (i) Alternate fuels: synthetic petrol by Bergius method, Power alcohol and Bio- diesel. **(ii)** Single component system-phase diagram of sulphur system.

Unit – II: Electrochemistry and Battery Technology:

Electrode potential-origin; Standard electrode potential, Derivation of Nernst equation, Numerical problems. Types of electrodes- Primary reference electrode-limitations and secondary reference electrode, Construction and working of Calomel and Ag/AgCl electrodes, Glass electrode- construction and working, determination of pH of solution using glass electrode.

Electrochemical Cells: Introduction, EMF of a cell, notation and sign conventions and numerical problems. Types of Electrochemical cells. Galvanic cell- Classification -primary & secondary cells, concentration cell. Fuel cells: Introduction, construction and working of H_2-O_2 fuel cell and Methanol-Oxygen fuel cell.

Battery Technology: Basic concepts, characteristics, Classification -primary, secondary and reserve batteries. Construction, working and applications of Ag_2O-Zn, Nickel-Metal hydride, Zinc air, Lithium-MnO_2 and Li-ion batteries. **10 hrs**

Self-study component: Construction, working and applications of lead-acid battery and types of fuel cells based on electrolyte used.

Unit – III: Corrosion Science and Metal Finishing:

Corrosion: Introduction, Dry and Wet corrosion. Electro Chemical theory of Corrosion, Types - Differential metal corrosion, Differential aeration corrosion, Pitting corrosion, Stress corrosion- Caustic embritlement. Factors affecting the rate of corrosion-Nature of metal, Nature of corrosive product, anodic and cathodic areas, pH and temperature. Corrosion control**:** Selection of materials and Proper designing, Cathodic protection. Corrosion Inhibitors. Anodizing of Aluminium, Metal coating - Galvanization and Tinning.

Metal finishing: Introduction, Technological importance of metal finishing, factors affecting the nature of electro-deposit. Electroplating of Au by cyanide process only neutral medium and chromium by Sulphate method. Electro-less plating- advantages of electro-less plating. Electro-less plating of Copper on PCB and Nickel with applications. **10 hrs**

Self-study component: Water line corrosion, phosphate and chromate coatings

Unit – IV: Material Science and Technology:

High Polymers: Introduction, Engineering Plastics. Glass transition temperature (Tg), Factors affecting on Tg and significance of Tg. Synthesis and applications of PMMA, polyurethane, poly carbonate, urea formaldehyde resins, polyester resins (Terrene) and Kevlar.

Laminates: i) Plywood ii) Laminated plastics iii) Laminated glass and iv) Thermo-cole and their applications.

Elastomers: Introduction, Synthesis and applications of silicon rubber & Butyl rubber. Vulcanization and compounding of rubber

Adhesives: Introduction, Synthesis & applications of Araldite (Epoxy resin).

Conducting polymer: Introduction, synthesis and applications of conducting poly-acetylene.

Cement: Introduction, types, mixing of additives to cement and properties of cement-quality, shrinkage, soundness, setting time, strength and color. Testing of cement.

Lubricants: Introduction**,** Functions, types, properties - viscosity, viscosity index, volatility, pour point, cloud point, flash point, oiliness and coke point, applications of lubricants.

10 hrs

Self-study component: Number average molecular mass and weight average molecular mass with problems.

Unit –V: Liquid Crystals, Nano-Chemistry, Pollution and Water Technology:

Liquid Crystals: Introduction, Classification- Thermo-tropic and Lyo-tropic with examples and differences. Types of meso-phases -nematic, chiral nematic (cholesteric), smectic and columnar. Applications of liquid crystals in electronic instruments and thermography.

Nano-Chemistry: Introduction, Bottom up and top down approach distinction between molecules, nano-particles and bulk materials. Size dependent properties, nano-particles, nano-rod, nano-tubes & nano-wire. Synthesis: Chemical vapour deposition. Properties and applications.

Water pollution: Introduction, sources and ill effects. Chemical Oxygen Demand and Biochemical Oxygen Demand. Determination of COD of industrial waste water. Numerical problems on COD. Sewage treatment-primary, secondary and tertiary.

Water Technology: Introduction, Impurities of water, International standards of drinking water, formation of scale and sludge, boiler scales and its ill effects. Prevention of boiler feed water by internal and external treatments- ion exchange process. Desalination of water-Electro-dialysis and Reverse Osmosis, Purification of water for municipal supply. **10 hrs**

Self-study component: Sources and ill effects of CO, CO_2 and particulate matters in Air pollution.

Text books:

1. Uppal. M.M. Engineering Chemistry Khanna Publishers, 35th Edition, 2015.
2. Jain and Jain, A text Book of Engineering Chemistry by Dhanapatrai Publications, New Delhi, 21st Edition, 2015.

References books:

1. Gray.G.W and Winsor.PA, Liquid crystals and plastic crystal, Vol-I, edited by, Ellis Horwood series in Physical Chemistry, New York. (P.No. 106-142) 12th Edition 2015.
3. B. K. Sharma. A Text Book of Environmental Chemistry and Industrial Chemistry by, Goel Publishing House, Meerut, 13th Edition 2015.
4. Murthy B.S, Shankar. P and Raju. B. A Text book of Nano-science and Nano-technology by Goel Publishing House, Meerut, 14th Edition 2015.
5. Engineering Chemistry by Dr. K. Pushpalatha, Wiley Publication, India, II Edition 2014.

Course Outcomes (Course Learning Outcomes, CO)

At the end of the course the students should be able to:

1. **CO1- Recognize** the importance of Chemical fuels and Phase rule.
2. **CO2 - Describe** the construction and applications of electrodes, cells, and batteries.
3. **CO3 -Conclude** the mechanism and prevention of corrosion of materials. Compare the Electro-plating and electro-less plating for engineering materials .
4. **CO4 - Prepare** the engineering plastics. Use of elastomers, Adhesives, Cement and lubricants in the field of engineering.
5. **CO5 - Aware** the knowledge of liquid crystals and nano science.
6. **CO6 - Analyze** the purification of water and it's important and understand about self study.

Department of Civil Engineering

Course Title : Engineering Mechanics			
Course Code: P17CV13/23	**Semester : I/II**	**L-T-P-H: 4 – 0 – 0 - 4**	**Credits: 4**
Contact Period : Lecture :52 Hr, Exam: 3Hr		**Weightage :CIE:50% SEE:50%**	

Course Learning Objectives (CLOs)

This course aims to

1. Understand coplanar concurrent force system and its classification, definitions of particle rigid body, mass, time, continuum force system- system of measurements –principle of transmissibility of forces, resultant of forces. Resolution of forces composition of coplanar concurrent forces-equilibrium of particles, free body diagram, Basic idealization of mechanics.
2. Understand Coplanar Non concurrent forces: Moment of a force, Varignon's theorem force couple system, composition of coplanar parallel and non-Concurrent forces – equilibrium of rigid bodies.
3. Understand support reactions, types of supports for planar structure- simple support, roller support, hinged support, and fixed support – numerical problems. Types of loads-concentrated load, uniformly distributed load, uniformly varying load.
4. Understand Friction, types of friction, characteristics of dry friction, laws of friction, angle of friction, angle of repose , cone of friction, application –body on horizontal plane and inclined plane subjected to forces ladder friction
5. Understand about Centroid and centre of gravity, Centroid of rectangular, triangular, circle, semicircle, quarter circle, and sector laminar from first principles.
6. Understand about moment of inertia of plane figures, radius of gyration, parallel axis theorem, perpendicular axis theorem, polar moment of inertia, moment of inertia of plane geometrical figures by integration, moment of inertia of composite sections.
7. Understand about dynamics, curvilinear motion, work, power and energy.

Course Content

UNIT – I

INTRODUCTION AND COPLANAR CONCURRENT FORCE SYSTEM: Classification-definitions, basic idealization of mechanics, particle, rigid body, mass, time, continuum, force, force system- system of measurements – principle of transmissibility of forces, resultant of forces. Resolution of forces, composition of coplanar concurrent forces-equilibrium of particles, free body diagram, Coplanar, Non concurrent forces: Moment of a force, Varignon's theorem, force couple system, composition of coplanar parallel and non-Concurrent forces –equilibrium of rigid bodies. **10 Hrs**

UNIT – II

SUPPORT REACTIONS: Types of supports for planar structure - simple support, roller support, hinged support, and fixed support. Types of loads- concentrated load, uniformly distributed load, uniformly varying load. – Numerical problems 6 **Hrs**

FRICTION: Introduction, types of friction, characteristics of dry friction, laws of friction, angle of friction, angle of repose , cone of friction, application –body on horizontal plane and inclined plane and ladder friction.

6 Hrs

UNIT – III

CENTROID AND CENTRE OF GRAVITY: Introduction to centroid and centre of gravity, Centroid of rectangular, triangular, circle, semicircle, quarter circle, sector laminar from first principles. Numericals on Centroid of composite lamina. **10 Hrs**

UNIT – IV

MOMENT OF INERTIA: Introduction to moment of inertia of plane figures, radius of gyration, parallel axis theorem, perpendicular axis theorem, polar moment of inertia, moment of inertia of plane geometrical figures by integration, moment of inertia of composite sections. **10 Hrs**

UNIT – V

DYNAMICS: Introduction to dynamics, Classification, curvilinear motion- projectiles. Introduction to work, power and energy, impulse, pile and hammer, centripetal and centrifugal forces, banking/super elevation **10 Hrs**

TEXT BOOKS:

1. Ferdinand L. Singer: Engineering Mechanics –Statics and dynamics, Harper and Row, Publishers Inc.
2. S.S Bhavikatti, A text on elements of Civil Engineering and mechanics, New age international publishers, 2015.

REFERENCE BOOKS:

1. Ramamrutham S: A text book of Applied mechanics, Dhanpatrai and sons
2. S. Rajashekaran, G Shankar Subramanian: Engineering Mechanics- Statics and Dynamics, Vikas Publishing House 1999.
3. Ferdinand Beer and Johnson F.R (Jr) Mechanics for Engineers, Tata Mc Graw-hill Publishing comp. Ltd New Delhi.

Course Outcome (CO)

After learning all the units of the course, the student is able to

1. Apply the knowledge of basic science and mathematics to classify the force systems.
2. Formulate the problems for different systems of forces and to analyse the same.
3. Compute the resultants of the given system of forces, centroid and moment of inertia of the section.
4. Analyse the problems with respect to linear and curvilinear motion.

Department of Computer Science & Engineering

Course Title: Computer Concepts and C programming			
Course Code:P17CS13/23	**Sem: I/II**	**L-T-P-H: 4-0-0-4**	**Credits: 4**
Contact Period: Lecture:52 Hrs, Exam: 3Hr		**Weightage: CIE:50; SEE:50**	

Prerequisites: Elementary Computer Knowledge and Knowledge of Elementary Mathematics and computer literacy

Course Learning Objectives:

This course aims to

1. **Identify** the various steps involved in designing a problem.
2. **Demonstrate** the use of Input and Output functions, Conditional and Unconditional statements, looping statements in C programs.
3. **Apply** the concept of arrays and strings in writing C programs.
4. **Analyze and develop** modular programming approach and **Identify** the use of pointer concept.
5. **Compare** structures and union and **Demonstrate** the use of files in C program.

Course Content

Unit -1

Problem design – Algorithms: characteristics, advantages and disadvantages.

Flowcharts: Symbols, advantages and disadvantages. Writing an algorithm and flowchart for the given problem.

Constants, Variables and Data Types: Importance of C, Basic structure of C program, Characters set, C tokens - Keywords, Identifiers, Constants, Variables, Data types, Declaration of variables.

Operators and Expressions: Arithmetic operators, Relational operators, Logical operators, Assignment operators, Increment and Decrement operators, Conditional operator, Bitwise operators, Special operators, Arithmetic expressions, Evaluation of expressions, Precedence of Arithmetic operators, Type conversions in expressions, Operator precedence and associativity. **11 Hours**

Unit – II

Managing Input and Output Functions: Formatted Input and Output statements.

Decision Making and Branching: Decision making and branching - Simple *if* statement, *if…else* statement, Nested *if…else* statements, The *else … if* ladder, The switch statement, The ternary operator, Unconditional branching statements – goto, break, continue, return, Programming examples. **10 Hours**

Unit – III

Decision Making and Looping: The while statement, The do-while statement, The for statement, Programming examples.

Arrays: Introduction, One dimensional array - Declaration and Initialization of one dimensional array, Two dimensional arrays - Declaration and Initialization of two dimensional arrays, Programs on one-dimensional and two dimensional arrays, Sorting - Bubble sort, Selection sort, Searching - Linear search, Binary search. **10 Hours**

Unit - IV

Strings: Definition, Declaration, Initialization of string, String input and output functions, String handling functions.

User defined functions: Need for User-defined Function, Elements of user defined functions, Actual parameter and formal parameter, Category of Functions, Local and global variables, **Pointers**: Pointer concepts – declaration , initialization , Accessing variables.

Different methods to pass parameters to functions, Programs on functions. **11 Hours**

Unit – V

Structures- Structure definition, Structure declaration and initialization, Accessing structures, Array of structures.

Unions: Union definition, Differences between structure and union.

Files: Introduction to files, Declaration of a file pointer variable, States and modes of a file, Standard library functions for files - open, close, read and write functions, File status functions, File positioning functions, System file operations. **10 Hours**

Text Books:

1. Programming in ANSI C, E. Balagurusamy, Tata McGraw Hill – 5th Edition.
2. Mastering C, K.R Venugopal, S.R Prasad, Tata McGraw Hill.

References Books:

1. Behrouz A. Forouzan, Richard F. Gilberg: Computer Science – A Structured Approach Using C, 3rd Edition, Cengage Learning, 2007.
2. Programming with C, R.S Bichkar, University press.

Course outcomes:

1. **Design** solution to the given problem**.**
2. **Apply** conditional and unconditional statements, looping statements while solving a given problem.
3. **Develop** programs for handling similar data types.
4. **Develop** the program using code reusability concept.
5. **Compare** structures and union and **Demonstrate** the use of files in C program.

Department of Mechanical Engineering

Course Title: Elements of Mechanical Engineering			
Course Code: P17ME14/24	**Sem: I / II**	**L-T-P-H : 4-0-0-4**	**Credits: 4**
Contact Period: 52 Hr; Exam: 3 Hrs.		**Weightage: CIE:50; SEE:50**	

Prerequisites: The students should have acquired the knowledge of elementary Physics and Chemistry.

Course Learning Objective:

The course aims at providing basic knowledge of some of the commonly used mechanical systems to all the students belonging to different disciplines of Engineering.

Relevance of the course: This course provides the essential basic knowledge of some of the commonly used mechanical systems to all the students belonging to different disciplines of Engineering.

.Course Content

Unit – 1

Steam formation and Turbines: Classification of boilers and their application. Steam formation, Definitions of specific volume, enthalpy, internal energy and Dryness fraction. Description of pressure-temperature diagram, Temperature-volume diagram and Temperature-enthalpy diagram. Steam turbines: Classification, principle and operation of impulse and reaction steam turbines. Gas turbines: Classification of gas turbines. Working

principle of open cycle and closed cycle gas turbine. **11 Hrs**

Unit – 2

I.C. Engines: Classification, Working principle of two stroke and four stroke petrol engines and four stroke diesel engines. Comparison between petrol and diesel engines and two stroke and four stroke engines. Simple problems based on indicated power, brake power, indicated thermal efficiency, brake thermal efficiency and Mechanical efficiency. **10 Hrs**

Unit – 3

Hydraulic Pumps: Introduction, Classification of Pumps, Positive displacement pumps**,** Working principle of single acting and double acting Reciprocating Pumps**,** advantage, disadvantages and applications of Reciprocating Pumps. **Centrifugal Pumps** :Introduction**,** Working principle, advantages, disadvantage and applications of Centrifugal Pumps, Difference between Reciprocating pump & centrifugal Pump, **Refrigeration & Air Conditioning:** Refrigeration, Refrigerants and properties of refrigerants, Vapour Compression Refrigeration, Vapour Absorption Refrigeration, Room air conditioner. **11 Hrs**

Unit – 4

Lathe: Introduction, Specifications of lathe, Principle of working of a center lathe, major parts of a lathe, Lathe operations: cylindrical turning, facing, thread cutting, Taper turning: **Drilling machine**: Principle of working of Radial drilling machine, Twist drill and its nomenclature. Drilling machine operations: drilling, boring, reaming, tapping. **Milling machine:** Principle of milling: Up milling and down milling methods, Horizontal and vertical milling machines. Milling operations: slab milling, end, slot milling. **Grinding machine**: Types of grinding machines: cylindrical and centerless grinding machine. **10 Hrs**

Unit – 5

Joining process: Soldering, Brazing and welding. Principle of soldering, types and properties of solders, applications of soldering. Principle of Brazing and its applications. Welding: classification of welding process, principle of electric arc welding, Oxy- acetylene gas welding, types of flames. Applications of welding. Comparison between soldering, brazing and welding. **Power transmission by belt Drives:** Types of belts, open and crossed belt drive, velocity ratio of pulleys, Length of belt. Numerical problems. **10 Hrs**

Self Learning Components: Renewable and nonrenewable energy resources, their advantages and disadvantages, comparison between renewable and nonrenewable energy resources. Working principle of MPFI and CRDI systems. Split Air conditioner and centralized air condition system. Bearings and lubrication- types of bearings, types and properties of lubricants. Super finishing operations- lapping and honing.

Text books

1. V. K. Manglik, **"Elements of Mechanical Engineering,"** PHI Learning Pvt Ltd. 2013, ISBN: 978-8120346291.
2. Kestoor Praveen and Ramesh M R**, "A Text Book of Elements of Mechanical Engineering,"** Interline Publishing Ltd., Bangalore, 2nd edition, 2006, ISBN: 1234567157184**.**

References

1 K. R. Gopalakrishna, **"A Text Book of Mechanical Engineering Science,**" Subhash Publications, Bangalore, 15th edition, 1999, ISBN: 9789383214075.

2 S. K. H. Chouadhury, A.K.H. Chouadhury, Nirjhar Roy, **"The Elements of Workshop Technology. Vol-1**," Media Promoters and Publishers, 2008, ISBN: 978-8185099149.

3 S. K. Chouadhury, S. K. Chouadhury, S. K. Hajra Chouadhury, Hajra Chouadhury, **"The Elements of Workshop Technology. Vol-2**," Media Promoters and Publishers, 2010, ISBN: 978-8185099156.

4 K.V.A. Balaji and K. Rama Sastry, **"Elements of Mechanical Engineering Sciences,**" Sanguine Technical Publishers, 2006.

Course Outcomes

At the end of the course the students should be able to:

1. **Explain** the formation of steam and working principle of steam and gas turbines.
2. **Classify and Explain** the working principles of different types of IC engines and calculate some of their performance parameters..
3. **Classify** different types of lathes and drilling machines and **explain** their working principles and different operations performed by them
4. **Classify** different types of Milling and Grinding machines and **explain** their working principles and different operations performed by them.
5. **Explain** the working principles of different joining processes like welding, brazing and soldering. Identify different types of belt drives.

Department of Mechanical Engineering

Course Title: Computer Aided Engineering Drawing			
Course Code: P17MED14/24	**Sem:I /II**	**L-T-P-H: 2-0-4-6**	**Credits-4**
Contact Period: 78 Hr; Exam: 3 Hrs.		**Weightage: CIE:50; SEE:50**	

Prerequisites: Knowledge of elementary Science, elementary mathematics and computer literacy.

Course Objective: The course aims at empowering the students with drafting skills and enhancing their visualization capacity in order to draw different views of the given object.

Relevance of the course: This course is required for communicating graphically, conceptualized engineering systems.

Course Content

Unit – I

Orthographic Projections of Points: Introduction to Drawing Standards, Creation of 2D environment using CAD software, Principles of Orthographic projections, Projections of points in all the four quadrants. **09hrs**

Unit – II

Orthographic Projections of Lines: Projections of straight lines using first angle projection, true and apparent lengths, true and apparent inclinations with reference planes. **15hrs**

Unit – III

Orthographic Projections of Plane Surfaces: Triangle, square, rectangle, pentagon, hexagon and circular plates in different positions by change of position method only. **15hrs**

Unit – IV

Projections of Solids: Projections of cube, right regular prisms, cylinders, pyramids and cones in simple positions. **21hrs**

Unit – V

Isometric Projections: Introduction to Isometric scale, Isometric projection of simple Planes, cube, right regular prisms, pyramids, cylinders, cones and frustums of cones and pyramids in simple positions, combinations of solids **18hrs**

Text books

1. K.R. Gopalakrishna, **"Engineering Graphics,"** Subhas Publications Bangalore, 32nd edition, 2005, ISBN: 5551234018854.
2. N.D. Bhatt & V.M. Panchal, **"Engineering Drawing,"** Charotar Publishing House, Gujarat, 48th edition, 2005, ISBN: 978-93-80358-96-3.

References

1 S. Trymbaka Murthy, **"Computer Aided Engineering Drawing,"** I.K. International Publishing House Pvt. Ltd., New Delhi, 3rd revised edition, 2006, ISBN: 9788188237944.
2 Luzadder Warren J., Duff John M., **"Fundamentals of Engineering Drawing with an Introduction to Interactive Computer Graphics for Design and Production,"** Prentice Hall of India Pvt. Ltd., Eastern Economy Edition, 2005, ISBN: 9788188237944.

Course Outcomes

At the end of the course the students should be able to:

1 **Use** computer tools to create simple geometries.
2 **Recognize** the location of the object with respect to the reference planes and draw its orthographic views.
3 **Create** simple two dimensional and three dimensional objects, draw their orthographic views and show the dimensions.
4 **Draw** the development of surfaces of regular solids.
5 **Draw** the isometric projection of regular solids.

Department of Electrical & Electronics Engineering

Course Title: Basic Electrical Engineering			
Course Code: P17EE15/25	**Semester: I/II**	**L:T:P:H-4:0:0:4**	**Credits:4**
Contact period : Lecture: 52 Hrs., Exam 3 Hrs.	**Weightage : CIE:50; SEE:50**		

Course Learning Objectives (CLOs)

1. Explain and analyse the basic concepts of electro magnetism and electrical d.c Circuits.
2. Demonstrate and analyse single phase a.c circuits.
3. Demonstrate and analyse 3 phase a.c circuits and develop the concepts of domestic wiring and measuring instruments.
4. Demonstrate the basic and working principal of d.c machines and synchronous generator.
5. Demonstrate the basic and working principle of single phase transformer and 3phase Induction motors

Course Content

Unit – I

D.C. Circuits: Ohm's Law and Kirchhoff's Laws, analysis of series & parallel circuits excited by independent voltage sources, Power and Energy calculations.

Electromagnetism: Basic concepts of Electromagnetism, Faradays laws, Lenz's Law, Fleming's rules, Statically & Dynamically induced EMF's, concept of Self Inductance, Mutual Inductance and Coefficient of coupling, Energy stored in Magnetic field.

Self Study: series parallel DC circuits **10 Hrs**

Unit – II

Single Phase AC circuits: Generation of sinusoidal AC voltage, definition of Average value, RMS value, Form factor and peak factor of sinusoidally varying voltage and current, meaning of lagging and leading of sinusoidal wave, Real power, Reactive power, Apparent power and Power factor, Analysis of R, L & C circuits, series & parallel Circuits.

Self Study: Analysis of series - parallel circuits. **10 Hrs**

Unit-III

Three Phase AC circuits: EMF Generation, Necessity and advantages of three phase system, Phase sequence, balanced supply and load, relationship between line and phase values for balanced star and delta connections, measurement of power in a three phase balanced circuit.

Domestic wiring and Measuring Instruments: Two-way and Three way control of a lamps, Electrical Safety – Electric shock and its Precaution Protection – Fuses, Necessity and types of Earthling. Construction and working of Dynamometer type wattmeter and Single phase induction type energy meter (problems excluded)

Self Study: Measurement of power in a three phase balanced circuit **10 Hrs**

Unit – IV

DC Machines:

Working principle of DC machine as generator and motor, constructional features, EMF equation of generator, types of armature winding, types of DC generators, problems on EMF equation, Back EMF and its significance, types of DC motors, torque equation of DC motor, necessity of a starter.

Synchronous Generators: Principle of operation. Types and constructional features, Concept of winding factor, EMF equation(Illustrative examples on emf equation excluding calculation of kd&kp)

Self Study: Characteristics and Applications of DC Motors **10Hrs**

Unit – V

Transformers: Principle of operation and construction of single phase transformers (core and shell type), EMF equation. Transformer on no-load & load, power losses, efficiency and voltage regulation (OC & SC tests Equivalent circuit & Phasor diagrams are excluded), illustrative problems on EMF equation and efficiency only.

Three phase induction motors: Concept of rotating magnetic field, principle of operation, types and constructional features, Slip and its significance, Necessity of a starter, Applications of squirrel cage and slip ring motors, Illustrative examples

Self Study: Transformer applications **10 Hrs**

TEXT BOOKS:

1. B.L. Theraja, A.K. TherajaA Textbook of Electrical Technology, Vol. 2, 23rd Edition, Publisher: S Chand & Co Ltd
2. M V Rao, "Basic Electrical Engineering", Publisher: Subhas Stores, 2015

REFERENCES:

1. Rajendra Prasad, “Fundamentals of Electrical Engineering”, 3rd Edition, Prentice hall of India Pvt, Ltd, 2014
2. V N Mittle and ArvindMittle, ”Basic Electrical Engineering” 2nd Edition, Tata McGraw Hill Publications,2005

Course Outcomes

After learning all the units of the course, the student is able to

CO1: Solve problems in electric and magnetic circuits using Faraday’s laws, Ohm’s law and Kirchoff’s law.

CO2: Analyze single phase and three phase AC circuits.

CO3: Demonstrate their understanding about earthing and different types of wiring.

CO4: Demonstrate their understanding about different types of measuring instruments and their usage.

CO5: Identify and analysethe parts of DC machines, Transformers, alternators and Induction machines.

Department of Electronics and Communication Engineering

Course Title : Basic Electronics			
Course Code: P17EC15/25	**Semester : I/II**	**L-T-P-H: 4 – 0 – 0-4**	**Credits:04**
Contact Period : Lecture :52 Hrs, Exam: 3Hrs		**Weightage :CIE:50% SEE:50%**	

Course Learning Objectives (CLOs)

1. Explain the operation of simple devices like Diode, MOSFET, Zener diode based on physics principles and Analyze simple circuits using diodes and MOSFETS.
2. Design simple rectifier, Zener regulator circuits, biasing circuits for obtaining the desired operating point to meet the specifications.
3. Analyze how MOSFETs could be used as an amplifier and as an oscillator.
4. Evaluate the advantages of providing negative feedback in amplifiers and Design simple circuits like amplifiers, comparators and summers using operational amplifiers.
5. Analyze the block diagram of general communication system and explain different types of modulation techniques.
6. Apply knowledge of basic communication theory in understanding operational principles of currently used Satellite systems, Mobile communication systems, ISDN, Microwave systems etc
7. Compile the different building blocks in digital electronics and implement simple logic functions after simplifying logic expressions.
8. Understand operating principles of Transducers and CRT and its uses in Electronic systems

Course Content

Unit-I

Diode Applications: Introduction, Load Line Analysis, Series Diode Configurations, Parallel and Series – Parallel Configurations, Sinusoidal inputs; Half-Wave Rectification, Full wave Rectification, Zener Diodes, **Power Supplies:** Introduction, General Filter Considerations, Capacitor Filters, IR Emitters, Liquid Crystal Displays, Solar Cells. **10Hrs**
Text-1:2.1, 2.2, 2.3, 2.4, 2.6, 2.7, 2.10, 15.1, 15.2, 15.3, 16.8, 16.9, 16.10

Unit-II

Field Effect Transistors: Depletion-type MOSFET, Enhancement type MOSFET, MOSFET Handling, VMOS, CMOS, MESFETs, **FET Biasing (only Voltage divider method):** Depletion-type MOSFET's, Enhancement-type MOSFET's.
FET Amplifiers: Depletion-type MOSFET, Enhancement-type MOSFET, E-MOSFET Voltage Divider Configuration, **Feedback and Oscillator circuits:** Feedback Amplifier-Phase and Frequency Considerations, Oscillator Operation, Phase Shift Oscillator **(only FET version).**
Text-1:6.7,6.8,6.9,6.10,6.11,6.12,7.7,7.8,8.8,8.9,8.11,14.4,14.5,14.6 **11 Hrs**

Unit-III

Operational Amplifiers: Introduction, Op-Amp Basics, Practical OpAmp Circuits, OpAmp Specifications-DC Offset Parameters, Op-Amp Specifications-Frequency Parameters, Differential and Common Mode Operation, **Op-Amp Applications:** Constant Gain Multiplier, Voltage Summing, Voltage Buffer, Controlled Sources, Active Filters (**Only First order LPF & HPF filters)** . **10 Hrs**
Text-1:10.1,10.4,10.5,10.6,10.7,10.9,11.1,11.2,11.3,11.4,11.6

Unit-IV

Digital Electronics: Introduction**,** Number Systems, Binary number Systems, Number Conversion, Binary Arithmetic, Signed Numbers, Hexadecimal number Systems, Hexadecimal to Binary and Binary to Hexadecimal conversion, Hexadecimal Arithmetic,

Switching and Logic Levels, Digital Waveforms, Characteristics Digital ICs, Boolean Algebra Theorems, Examples of Combinational Circuits, Multiplexers, Decoders, Logic Gates, Algebraic Simplification, NAND and NOR Implementation
Text-2: 9.2,9.3,9.4,9.5,10.1,10.2,10.3,10.4.2,10.4.3,10.4.4,11.2,11.2.1,11.2.2,11.2.3,11.4, 11.4.1,11.4.2,11.7,11.8 **10 Hrs**

Unit-V

Communication Engineering: Introduction, Elements of Communication Systems, Modulation, Amplitude Modulation, Frequency (FM) and Phase (PM) Modulation, Transmitter, Automatic Gain control (AGC) circuit, Digital Communication, Multiplexing, Pulse Demodulation, The Telephone Systems, Data transmission, Digital Modulation, Multiplexing and Multi-Access, Transmission lines, radio waves, Antennas, Television, Satellite Communication, Principle of Operations of Mobile Phone, FAX, ISDN, Microwave Communication, Optical Fibre Communication (**Excluding** : Amplitude Modulation circuit)
Transducers: Introduction, Mechanical Transducers, Passive Electrical Transducers, Active Electrical Transducers.
Text-2: 15.1 - 15.4, 18.1 - 18.22 **11 Hrs**

Self-Learning Component (not included for SEE):
Study and Submit the report for the following topics

1. Voltage Multiplier Circuit
2. IC Voltage Regulator
3. MOSFET Relay Driver
4. Fixed Biasing Circuit using DMOSFET and Feedback Biasing Circuit using EMOSFET
5. Instrumentation Amplifier
6. AC and DC Mili-Voltmeter using OP-AMP
7. Code Converters using Gates
8. 1Bit and 2Bit comparators using gates.
9. Any two practical Applications of Transducers.
10. Satellite launching vehicles GSLV from ISRO (Only Block Diagram and Principle of operation)

TextBooks:

1)"Electronic Devices and Circuit Theory", RobertL. Boylestad and Louis Nashelsky, 10th Edition, Prentice Hall,2009.
2) "Basic Electronics", D P Kothari, I J Nagrath ,McGraw Hill Education,2014.

ReferenceBooks:

1) "Electronic Devices and Circuits", David A. Bell. Prentice Hall, New Delhi, 2004.
2) "Electronic Principles", Albert Malvino, David J Bates, 7th Edition, McGraw Hill Education,2007.
3) "Digital Logic and Computer Design", M. Morris Manno, 4th Edition, Prentice Hall, 2013.
4) "Principles of Electronic Communication Systems", Louis E Frenzel, 6th Edition, McGraw Hill Education, 2012.

Course Outcomes (CO)

After learning all the units of the course, the student is able to

Course Title: Microwaves and Antennas		
CO #	**Course Outcome**	**Program Outcome Addressed (PO #) with BTL**
CO1	Apply knowledge of physics and mathematics to understand operation of PN diodes, Zener diodes MOSFET, solar cells, LCD, CRT, Transducers, modulation techniques and Opamps,	PO1 [L1]
CO 2	Analyze circuits built with diodes, Zener diodes, MOSFET and Opamp	PO2[L2]
CO3	Design simple circuit to perform rectification, voltage regulation, Opamp based amplifier, summer and filter.	PO2[L2], PO3[L3]
CO4	Analyze and implement basic Digital Electronic circuits for a given application using knowledge of Boolean Algebra and Basic gates.	PO2 [L3]
CO5	Discuss different modulation techniques and communication systems.	PO2 [L3]

Department of Mechanical Engineering

Course Title: Basic Mechanical Engineering Science Lab			
Course Code: P17MEL16/26	**Sem:01/02**	**L-T-P-H : 0-0-3-3**	**Credits:1.5**
Contact Period: Practicals: 39 Hrs; Exam: 3 Hrs.		**Weightage: CIE:50; SEE:50**	

Course Objective: The course aims at making the students to understand the use of common workshop tools and develop skills of creating physical models using these tools. To provide basic knowledge on some of the commonly used mechanical systems to the entire students belonging to different disciplines of Engineering.

Relevance of the course: This course helps in physical realization of conceptualized engineering systems.

COURSE CONTENT

PART-A

1. **Introduction to Fitting:** Study of fitting tools, operations and joints- One Model. **9 hrs**
2. **Development of surfaces & sheet metal work**–Development of lateral surfaces of square prism, cylinder, frustum of cone. Sheet metal models of square prism, cylinder and frustum of cone. Mechanical joint and Soldering Joint. **9 hrs**
3. **Arc Welding models:** study of electric arc welding equipments and preparation of butt joint, lap joint and T-joint. **3 hrs**
4. **Drilling and tapping:** Study of drill tool and preparation of model using drilling and tapping operations. **3 hrs**
5. **Demonstration:** Demo on casting process, lathe/CNC machine operations. **3 hrs**

PART-B

6. **Calibrations:** Calibration of pressure gauge and thermocouple. **3 hrs**
7. **Oil Testing:** Determination of flash and fire point of lubricating oils. **3 hrs**
8. Study of Vapour Compression Refrigeration and determination of its COP. **3 hrs**
9. **Demonstration:** Demo on hydraulic pump, two stroke and four stroke engine. **3 hrs**

References

1 Hazara Choudhry **, "Workshop Technology: vol 2,"** Media promoters and publishers pvt ltd., 2010, ISBN: 978-8185099156.

2 J K Gupta & R S Khurmi, **"A Textbook of Workshop Technology,"** S. Chand Publishing *company, ISBN: 9788121908689.*

3 K. R. Gopalakrishna, **"A Text Book of Mechanical Engineering Science,**" Subhash Publications, Bangalore, 15th edition, 1999, ISBN: 9789383214075.

Course Outcomes

At the end of the course the students should be able to:

1. **Recognize** the different types of tools used in fitting, arc welding, drilling and tapping operations and **create** their simple models.
2. **Draw** development of lateral surface of simple solids and **create** simple sheet metal models.
3. **Calibrate** pressure gauge and thermocouple.
4. **Determine** flash and fire points of lubricating oil.
5. **Demonstrate** the casting process, Lathe/CNC machine operation and working principle of hydraulic pump, two stroke and four stroke I C engines.

A. Evaluation Scheme				
Scheme	**Weightage**	**Marks**	**Event Break Up**	
CIE	50%	50	**Test**	**Record**
			20	30
SEE	50%	50		

Scheme for Semester End Examination	
Part –A One Question from Fitting or Development Model One Question from Welding or Drilling/Tapping	 20 Marks 10 Marks
One Question from Part -B	10 Marks
Viva – Voice	10 Marks
Total	**50 Marks**

Department of Computer Science & Engineering

Course Title: C Programming Lab			
Course Code:P17CSL16/26	**Sem: I/II**	**L-T-P-H : 0-0-3-3**	**Credits:1.5**
Contact Period:Lecture:39 Hr Exam: 3Hr		**Weightage: CIE:50;SEE:50**	

Prerequisites: Knowledge of Elementary Mathematics and computer literacy

Course Learning Objectives

The student should be able to,

1. **Implement** conditional and unconditional branching, looping statement while solving a problem.
2. **Implement** searching and sorting techniques.
3. **Implement** different string operations.
4. **Implement** pointers, structures, unions and file operations.
5. **Implement** the concept of code reusability.

1) Given the register number(int data type), marks of 5 subjects for 100 marks of a student, write a program to display the grade of the student according to the following condition.
   - Minimum passing marks is 35 in all subjects
   - Average Score >= 35 and < 50 no grade "Pass"
   - Average Score of 50 to 60 percent is grade 'D'
   - Average Score > 60 and <= 70 percent is grade 'C'
   - Average Score > 70 and <= 80 percent is grade 'B'
   - Average Score > 80 and <= 90 percent is grade 'A'
   - Average Score >90 grade 'S'
2) Write a program to find the roots of a quadratic equation using if - else statements
3) Write a program to perform Addition, Multiplication, Subtraction, Division, Modulo, Shift Left, Shift Right operations using multiple Case label.
   Ex : + or A ---Addition * or M----Multiplication etc.
4) Write a program to check whether the given number is fibonacci number or not. Use while statement.
5) Evaluate the following series
   Sin(x) = x – x^3/3! + x^5/5! – x^7/7! ……. Up to given accuracy.
6) Read N names and perform selection sort on them.
7) Read an array of N elements and search a given element using binary search.
8) Compute the multiplication of 2 matrixes using functions.
9) Print and count all the prime numbers within a given range using functions.
10) Assume the student records contain the following fields: name, Roll number, branch, marks, address and blood group. Write a program to print the student details based on the blood group given at run time.
11) Write a program by reading N integer data stored in a file, sort it and write the sorted data into another file.
12) Swap two integer number using pass by reference method

Course Outcomes

The student will be able to,

1. **Develop** programs using C language concepts.
2. **Design** the problem using modular programming concept.
3. **Develop** applications using files I/O operations.

Department of Physics

Course Title: Engineering Physics Lab			
Course Code: P17PHL17/27	**Sem:** I/II	**L-T-P-H :** 0-0-3-3	**Credits:**1.5
Contact Period: Lecture : 39 Hrs**., Exam:** 3Hr	**Weightage: CIE:** 50% **; SEE:** 50**% Marks**		

Prerequisites:

Introduce the basic concepts and principles of Physics as fundamental. In the laboratory, the students will carry out the experiments on basic electrical circuits, properties of matter, laser optics and sound. The course provides more thorough founding in applied Physics of an area chosen by the students.

Course Learning Objectives (CLOs):

The course aims to

1) Demonstrate competency and understanding of the basic concepts found in Physics.
2) Conduct experiments as well as to analyze and interpret data using monochromatic source.
3) Utilize the scientific method for investigation and to demonstrate competency with experimental methods that are used to discover and verify the concepts related to content knowledge.
4) Use the techniques, skills and modern engineering tools necessary for engineering practices.

Course Content

PART – A

1. **Newton's ring** - Determination of wavelength of the given monochromatic source using plano-convex lens.
2. **Uniform bending** - Determination of the Young's modulus of the given material by uniform bending method.
3. **Diffraction grating** - Determination of wavelength of the given LASER source.
4. **Torsional pendulum** - Determination of rigidity modulus of the given material by torsional pendulum method.
5. **Semiconductor** - Determination of energy gap of a given semiconductor by four probe method.
6. **Ultrasonic Interferometer**- Determination of velocity of ultrasonic's and compressibility of liquid.
7. **Optical fiber** - Determination of acceptance angle and numerical aperture of optical fiber.

PART – B

8 **Transistor** - Draw the output characteristics of a transistor in CE-Mode and hence find output resistance, current gain and current amplification factor.

9 **Dielectric constant** - Determination of the dielectric constant by finding capacitance of a capacitor in charging and discharging method.

10 **Fermi energy** - Determination of the Fermi energy and Fermi temperature of a given coil.

11 **Black body** - Verification of Stefan's law and Stefan's 4^{th} power law of radiation.

12 **Planck's constant**- Determination of wavelengths of different LED's and verification of Planck's constant.

13 **LCR resonance circuit** - Determination of quality factor and self inductance of the coil in series and parallel resonance.

14. **Photodiode** – Study of I -V characteristics and responsivity of the photodiode.

Reference Book:

1. **Practical Physics** – Harnam Singh and Dr. P.S. Hemne – S Chand and Co.Ltd.

<table>
<tr><th colspan="5">Evaluation Scheme</th></tr>
<tr><th colspan="5">I. CIE Scheme: Continuous Internal Evaluation (CIE) Scheme</th></tr>
<tr><th>Scheme</th><th>Weightage</th><th>Marks allotted</th><th>Event Break Up</th><th>Distribution of Marks</th></tr>
<tr><td rowspan="3">CIE</td><td rowspan="3">100%</td><td rowspan="3">50</td><td>1. Performance of each experiment conducted is evaluated for 20 marks and average is taken for all the experiments.</td><td>20</td></tr>
<tr><td>2. Each experiment in Record is evaluated for 10 marks and average is taken for all the experiments in Record.</td><td>10</td></tr>
<tr><td>3. A test is conducted and is evaluated at the end of the semester.</td><td>20</td></tr>
<tr><td colspan="4">Total CIE shall be calculated by adding above three components</td><td>50</td></tr>
<tr><th colspan="6">II. SEE Scheme: Semester End Examination (SEE) Scheme</th></tr>
<tr><th rowspan="2">Scheme</th><th rowspan="2">Weightage</th><th rowspan="2">Marks allotted</th><th rowspan="2">Event Break Up</th><th colspan="2">Distribution of Marks</th></tr>
<tr><th>Part (A+B)</th><th>Total</th></tr>
<tr><td rowspan="4">SEE</td><td rowspan="4">100%</td><td rowspan="4">50</td><td>1. Experimental write-up work</td><td>05 + 05</td><td>10</td></tr>
<tr><td>2. Set-up /Circuit connections, conduction of experiments and taking readings</td><td>10 + 10</td><td>20</td></tr>
<tr><td>3. Calculations, Graph and Results</td><td>05 + 05</td><td>10</td></tr>
<tr><td>4. Viva-Voce</td><td>05 + 05</td><td>10</td></tr>
<tr><td colspan="5">Total SEE shall be calculated by adding above four components:</td><td>50</td></tr>
<tr><td colspan="6">Note: i) Semester End Examination (SEE) is conducted for 50 marks in 3 hrs.
ii) A students must do two experiments; one from Part-A and one from Part-B
iii) Each experiment carries 25 marks
iv) For change of experiment 10 mark is deducted out of 25 marks</td></tr>
</table>

Course Outcomes (Course Learning Outcomes) (COs)

At the end of the course the students should be able to:

1) Develop the skill of setting and conduct the experiments relevant to basic concepts, theories and phenomenon of Physics.
2) Use different measuring tools and techniques to conduct the experiments.
3) Give the physical interpretation for observed measurements and determine the relevant physical quantities.

Department of Chemistry

Course Title: Engineering Chemistry lab			
Course Code:P17CHL17/27	**Sem:I/II**	**L-T-P-H : 0-0-3-3**	**Credits: 1.5**
Contact Period: Lecture: 39 Hr, Exam: 3 Hr		**Weightage: CIE:50; SEE:50**	
Pre-requisites :			

Prerequisites:

1. Engineering Chemistry lab play an important role to solve many problems in engineering and medical fields.
2. In this lab the identification of quality and quantity of sample using for manufacture of many engineering materials.
3. The lab is useful to analyses of air and water pollution.
4. Chemistry lab is also useful to detection of metals in alloys which is used to manufacture engineering articles.
5. The lab is also useful in the determination of metal ion in the body fluid which play an important role in identification of diseases.

Course Learning Objectives (CLOs):

The course aims to

1. Determination of physical parameters of materials such as pKa value, pH of the solution, viscosity, EMF of the cell, concentration of the colored solutions, conductance of polar electrolyte and some important metals present in fluid using electronic instruments, which helps for engineering and medical applications.
2. Analyze the total hardness, alkalinity of water and COD of waste water.
3. Estimate the quality, quantity and strength of the cement.
4. Understand the importance of alloys and ores by which the extraction of metals from ores and alloys.
5. Find out concentration, quality and quantity of the test solution by volumetric analysis.
6. Preparation of standard solution by finding the weight of the substance and measuring the volume of the solution by using volumetric apparatus.

Program objective:

Engineering Chemistry lab is the basic subject for all Engineering disciplines. It gives the various information of all basic analysis of compounds and elements, laws and applications in the field of Engineering.

Course Content

Part-A: Volumetric analysis

1. Estimation of hypo ($Na_2S_2O_3$) using Potassium dichromate crystals.
2. Determination of total hardness of water by EDTA method.
3. Determination of chemical oxygen demand of industrial waste water.
4. Determination of percentage of copper in brass.
5. Determination of percentage of iron in hematite ore solution.
6. Determination of percentage of calcium oxide in cement solution.
7. Determination of total alkalinity of given water sample. **(Self conducting experiment)**

Part- B: Instrumental analysis

8 Determination of pKa value of a weak acid using pH meter.
9 Determination of viscosity coefficient of a organic liquid using viscometer.
10 Potentiometric estimation of FAS or Mohr's salt.
11 Conductometric estimation of acid mixture.
12 Colorimetric estimation of copper.
13 Colorimetric estimation of iron.
14 Flame photometric determination of sodium in a fluid. **(Self conducting experiment)**

Text Books

1. Vogel's A.I. A text book of quantitative analysis, 35th edition, 2012.
2. Willard and others. A text book of Instrumental analysis, 6th edition 2012.

Examination:

Part – A: Common experiment for all students

Part – B: Different experiments shall be set up for the students.

Program outcome: With the knowledge of Engineering Chemistry lab, the students become quite competent in tackling various problems in their Engineering career.

<table>
<tr><th colspan="4">1. Evaluation Scheme</th></tr>
<tr><th colspan="4">2. CIE: Continuous Internal Evaluation</th></tr>
<tr><td>Scheme</td><td>Weightage</td><td>Marks</td><td>Distribution of marks for CIE</td></tr>
<tr><td>CIE</td><td>100%</td><td>50</td><td>1. Each experiment will be conducted and evaluated for 20 marks and average marks of all the experiments will be considered
2. Each experiment record will be evaluated for 10 marks and average record marks will be considered.
3. Lab test will be conducted for 20 marks.
4. CIE shall be calculated by adding of all above marks.</td></tr>
<tr><td colspan="4">2. SEE: Semester End Examination</td></tr>
<tr><td>SEE</td><td>100%</td><td>50</td><td>
<table>
<tr><th colspan="4">Student shall be done two experiments for SEE in 3 hrs.</th></tr>
<tr><td colspan="4">Distribution of marks for SEE</td></tr>
<tr><th>Sl. No</th><th>Distributions</th><th>Part (A+B)</th><th>Total</th></tr>
<tr><td>1</td><td>Procedure writing</td><td>(05+05)</td><td>10 marks</td></tr>
<tr><td>2</td><td>Experimental results</td><td>(12+12)</td><td>24 marks</td></tr>
<tr><td>3</td><td>Calculations</td><td>(05+05)</td><td>10 marks</td></tr>
<tr><td>4</td><td>Viva – voce</td><td>(03+03)</td><td>06 marks</td></tr>
<tr><td colspan="2">Total</td><td>(25 + 25)</td><td></td></tr>
</table>
</td></tr>
</table>

Course Outcomes (Course Learning Outcomes) (COs)

At the end of the course the students should be able to:

1) **Conduct** the experiments.
2) **Determine** quality, quantity and concentration of the solution.
3) **Understand** the aim of the experiments.
4) **Learn** to do the experiments and to get accurate results in examination.
5) **Apply** the principles of chemistry experiments in the field of engineering.

Training and Placement

Course Title: Effective Communication Development. (ECD)			
Course Code :P17HU18	**Semester : I**	**L - T – P-H-0:2:0:2**	**Credits-1**
Contact Period: Lecture: 32Hrs, Exam: 3 Hrs		**Weightage: CIE:50; SEE:50**	

Course Learning Objectives (CLOs)

This course aims to

1 Recognize common mistakes done by an individual in the course of his/her communication.
2 Appraise knowledge level of English language and enhance better communication.
3 Recognize the fear of speaking English and to build the morale.
4 Identify common pronunciation error and rectify them.
5 Enable the individual to build his/her creative thinking (Thinking in English).
6 Illustrate the basic rules of sentence structure (Subject verb agreement).
7 Explain the importance of usage of Tenses and articles.
8 Identify the present vocabulary of an individual and also to learn ways of building it.
9 Empower the individual with better writing skills.
10 Ensure that the individual has elevated life skills.

Course Content

Unit – I

Subject Verb Agreement: Basic rules of sentence structure, Usage of singular and plural, Usage of appropriate verb, Introduction to phrases, Construction of Simple sentences and Compound Sentences, Introduction to parts of speech **6 Hrs.**

Unit – II

Tenses : Identification of tenses, Past tense, Present tense, Future tense, Indicators of tenses, Introduction to verb tenses, Past perfect, Past progressive, Past perfect progressive, Present perfect progressive, Future perfect, Future progressive

Articles : Introduction to articles, Exploring the usage of ‘a’, ‘an’ and ‘the’, Golden rules of articles, Differentiating between definite and indefinite articles, Understanding the exceptions of definite and indefinite articles **8 Hrs.**

Unit – III

Vocabulary builder - Getting off a good start: How to test your present vocabulary, how to start building your vocabulary, how to talk about personality types, how to talk about doctors, how to talk about various practitioners, how to talk about science and scientists, how to talk about liars and liars. Each of these sessions includes origin of words and related words, Etymology, tools to assess and follow up the progress. **8 Hrs.**

Unit – IV

Writing Skills 1: Sentence Formation, Punctuation, Avoiding Cliché, Different Types of Writing Formats, Importance of Writing Skills, Formal and Informal Style of Writing.**4 Hrs.**

Unit – V

SWOT: Identifying the individual’s Strengths, Weakness, Opportunities and Threats by using SWOT Matrix, Difference between internal and external factors, Aids on utilizing strengths to maximum effect for both personal and professional growth, Aids to identify the origin of the weakness and take corrective measures, Aids to use one’s strengths to identify and maximise both personal and professional opportunities, Identifying the external factors/change in the external environment that can pose threats, Tackling threats appropriately.

Goal Setting: Understanding of the meaning of ‘Goals’, Understanding the importance of goals, Necessity of goals, 5 myths of goals, Long term and Short term goals, SMART goal setting technique.

Resume Building: Meaning of Resume, Difference between Resume, Curriculum Vitae and Bio-data, Difference between creating a resume and building a resume, Importance of

resume, Importance of Academic achievements, Importance of extracurricular achievements, Importance of striking a balance between curricular and co-curricular activities, Value of an all-rounder, Structure of a resume, Importance of building resume from 1st Year Engineering

Etiquettes: What are Etiquettes, Importance of Professional Etiquettes, Importance of First Impression, Professional presence, Importance of Formal dressing, Decoding the formal dress code, Professional body language, Importance of Microsoft PowerPoint in professional circuits

Watch the Time: Organizing Yourself, Time Saving Techniques, Understanding Priorities Based Time Roles, Procrastination, Different Methods of Splitting Time, Efficient Time Utilization, Value of Time, Streamlining Daily Routine , Big rock theory, Spent time matrix, Urgency vs Importance, Time bound goal management, 10 time management mistakes, Essential habits for better time management. **6 Hrs.**

Reference Books:

"Word Power Made Easy New Revised and Expanded Edition", First Edition, Norman Lewis, Goyal Publisher.

"Essential English Grammar", Raymond Murphy, Cambridge University Press, new edition

"The 7 habits of Highly Effective People" by Stephen R. Covey

Course Outcomes (CO)

After learning all the units of the course, the student is able to:

1. Rectify Indianism and have better ability to frame grammatically correct sentences. L4
2. Exhibit knowledge of correct pronunciation of words. L2
3. Exhibit amplified level of confidence to express themselves in English. L3
4. Reflect elevated standard of learning through the implementation of creative cognitive techniques. L4
5. Understand the correct usage of Tenses and Articles. L4
6. Increase the number of words in his/her day to day usage of vocabulary.L1
7. Confidently attempt writing grammatically correct English paragraphs. L2

Course Title: Indian Constitution, Human Rights and Professional Ethics			
Course Code: P17HM19/29	**Semester : I**	**L-T-P-H: 2–0-0-0-2**	**Credits:NA**
Contact Period : Lecture :26 Hr		**Weightage :CIE:100% - [P/NP]**	

Course Content

I. Indian Constitution:

1 Introductory Part - The preamble, Fundamental rights
2 Directive principles of state policy - and fundamental duties
3 The union executive, union legislature and the union judiciary
4 The state executive, state legislature and the high court in the states
5 Special provision for scheduled caste and scheduled tribes
6 Election commission - Functions - Emergency provisions and amendment of the constitution

II. Human rights:

Aims and objectives to create responsible citizenship with awareness of human rights and latest development.

1. Protection of human rights and protection of human rights act - 1993
2. Human right - with related to rights of women, children disabled, tribal's, aged and minorities

III. Professional Ethics:

1. Aims, objects - advantages with national and international, recent development.

Department of Environmental Engineering

Course Title : Environmental Studies			
Course Code: P17HM19/29	**Semester : I/II**	**L-T-P-H: 2–0-0-2**	**Credits:NA**
Contact Period : Lecture :26 Hr		**Weightage :CIE:100% - [P/NP]**	

Prerequisites:

The student should have undergone the course on Environmental Studies (Code: P17EV19/29)

a) ***Course Learning Objectives (CLO) :***

At the end of the course the students should be able to:

1 Explain the need for Environmental Management
2 Implement standard data like water, wastewater and air pollution.
3 Demonstrate the use of standard data to compare with the field data.
4 Choose appropriate data to protect environmental.
5 Design environmental amenities based on the needs.

b) Relevance of the Course

Environmental Studies is a foundation course in BE (Environmental Engineering) program, that builds the program design and implementation competence in student through choice of appropriate areas.

The course aims at developing the understanding variations in water, wastewater and air pollution and also the ability to build new ideas.

Course Content

Unit – I

Environment – Definition, Ecosystem – Balanced Ecosystem, Human activities – Food Shelter, Economic and Social Security. Transportation activities, Environmental impact Assessment, Sustainable Development. **6 Hrs.**

Unit – II

Natural Resources – Water resources – Availability and Quality aspects, Mineral Resources, Forest Wealth, Material Cycles – (Carbon, Nitrogen and Sulphur Cycles) Water borne diseases, water induced diseases, Fluoride problem in drinking water. 5**Hrs.**

Unit – III

Energy – Different types of energy, Conventional and Non-Conventional sources – Hydro Electric, Fossil fuel based, Nuclear, Solar, geothermal, tidal, wind, Biomass and Bio-gas. Hydrogen as an alternative future source of energy. **5 Hrs.**

Unit – IV

Environmental Pollution and their effects. Water pollution, Land pollution, Noise pollution Public Health aspects. Current Environmental issues of importance: Population Growth Climate change and Global warming – Effect, Urbanizations industrialization. **5 Hrs.**

Unit –V

Acid Rain, Ozone layer depletion, Animal Husbandry. Environmental protection – Role o Government, Legal aspects, initiatives by Non-Governmental Organizations (NGO Environmental Education, Women Education. **5 Hrs.**

Text Book:

1)Environmental Studies – Benny Joseph – Tata McGraw Hill – 2005

References:

1)Principles of Environmental Science and Engineering – .VenugopalaRao P, Prentice Hall 2005
2)Elements of Environmental Science and Engineering – Meenakshi P, Prentice Hall of India, 2
3)Environmental Studies – Anil Kumar D.C, New age International Publishers, 2007

Department of Kannada

Course Title : Kannada Kali			
Course Code: P17HM110/210	**Semester : I/II**	**L-T-P-H: 2–0-0-2**	**Credits:NA**
Contact Period : Lecture :26 Hr	**Weightage :CIE:100% - [P/NP]**		

Lesson 1 : Introducing each other – 1.
Personal Pronouns, Possessive forms, Interrogative words.

Lesson 2 : Introducing each other – 2.
Personal Pronouns, Possessive forms, Yes/No Type Interrogation.

Lesson 3 : About Ramanaya.
Possessive forms of nouns, dubitive question, Relativenouns.

Lesson 4 : Enquiring about a room for rent.
Qualitative and quantitative adjectives.

Lesson 5 : Enquiring about the college.
Predicative forms, locative case.

Lesson 6 : In a hotel.
Dative case defective verbs.

Lesson 7 : Vegetable market.
Numeral,plurals.

Lesson 8 : Planning for a picnic.
Imperative, Permissive, hortative.

Lesson 9 : Conversation between Doctor and the patient.
Verb-iru, negation – illa, non – past tense.

Lesson 10: Doctors advise to Patient.
Potential forms, no – past continuous.

Lesson 11: Discussing about a film.
Past tense, negation.

Lesson 12: About Brindavan Garden.
Past tense negation.

Lesson 13: About routine activities of a student.
Verbal participle, reflexive form, negation.

Lesson 14: Telephone conversation.
Past and present perfect past continuous and their negation.

Lesson 15: About Halebeedu, Belur.
Relative participle, negation.

Lesson 16: Discussing about examination and future plan.
Simple conditional and negative.

Lesson 17: Karnataka (Lesson for reading).

Lesson 18: Kannada Bhaashe (Lesson for reading).

Lesson 19: ManataruvaSangatialla (Lesson for reading).

Lesson 20: BekuBedagalu (Lesson for reading).

II Semester

Department of Mathematics

Course Title: Engineering Mathematics-II			
Course Code:P17MA21	**Sem:** II	L-T-P-H: 3-2-0-5	**Credits:** 4
Contact Period: Lecture: 52Hrs**, Exam:** 3 Hrs		**Weightage: CIE:50%; SEE:50%**	

Prerequisites:

The student should have acquired the knowledge of elementary mathematical tools including that of PUC (10+2) level.

Course Learning Objectives (CLOs):

At the end of the course the students should be able to:

I. Learn the basic concepts related to matrices and their elementary properties including elementary properties, rank, echelon forms etc. and making use of matrix theory in its application to linear system of equations, Eigen values/vectors similarity and diagonalisation of matrices.

II. Develop modeling of physical phenomena through linear differential equations of higher order including Cauchy's and Legendre's differential equations and, utilize the standard methods such as inverse differential operator, variation of of parameters etc. to solve them.

III. Obtain Laplace transforms and inverse Laplace transforms of elementary/standard functions, and utilize the same in solving differential/integral equations so as to analyze the linear time-variant systems arising in engineering applications including electrical circuits, control theory mechanical systems and harmonic oscillators etc.

VI. Apply the idea of partial differentiation in the study of Jacobians, computation of errors and approximations, in the Taylors series expansion, and, in the calculation of maxima and minima of functions of two or more variables. . Disseminate the vector integration to use in the study of line integrals, Greens, Stokes and Gauss divergence theorems with their scientific/engineering applications.

V. Widen the idea of integration to functions of two or more variables, understanding the region of integration with the change of order of integration Make use of the idea of multiple integration to find the relevant area and volume. Familiarize the idea of Beta and Gamma functions and their practical utility.

Relevance of the Course

Engineering Mathematics- II is another fundamental course for all branches in BE program, that assemble the awareness in understanding inter- linked relevant engineering courses such as control theory, mechanical systems, linear systems , eigenvalue problems etc., by applying appropriate mathematical tools of partial differentiation, multiple integration, vector integration, ordinary differential equations and Laplace transforms.

Course Content

Unit – I

Linear Algebra-I: Introduction - Rank of matrix by elementary row operations - Echelon form of a matrix. Consistency of system of linear equations - Gauss elimination method. Gauss-Jordan and LU decomposition methods.

Eigen values and Eigen vectors of a square matrix. Application of Cayley-Hamilton theorem (without Proof) to compute the inverse of a matrix-Examples. Similarity of matrices and, diagonlisation of matrices (For 2×2 real matrices only).

Self study component- Review of elementary matrices. **10 Hrs.**

Unit – II

Linear differential equations of second and higher order equations with constant coefficients. Homogeneous /non-homogeneous equations. Inverse differential operators. Solutions of initial value problems.

Method of undetermined coefficients. Method of variation of parameters. Solution of Cauchy's homogeneous linear equation and Legendre's linear differential equation.
Self study component-Review of linear and non linear I order ODE. **10 Hrs.**

Unit – III

Laplace Transforms: Definition – Transforms of elementary functions. Transforms of derivatives and integrals, Transforms of periodic function, unit step function (All results without proof)-Problems only.
Definition of Inverse Laplace transforms. Evaluation of inverse transforms by standard methods. Convolution theorem- Problems only. Application of Laplace transforms method to solutions of linear differential equations.
Self study component-Applications of Laplace transform - unit impulse function. Solution of Simultaneous ODE by Laplace method. Vibration of string deflection of beams and L-R-C circuits. **12 Hrs.**

Unit – IV

Applications of partial differentiation to Jacobians, errors and approximations. Taylor's Theorem for a function of two variables (without proof). Maxima and Minima for a function of two variables. Lagranges' method of undetermined multipliers with one subsidiary condition.
Vector integration- Integration of vector functions. Line integrals, surface and volume integrals. Green's, Stoke's and Gauss's divergence theorem/s (without proof)-Illustrated examples. Orthogonal curvilinear coordinates.
Self study component-Proof of Green's, Stoke's and Gauss's divergence theorem Expressions for grad ϕ div $\overline{A}$ curl $\overline{A}$ and Laplacian of ϕ in OCC.

Unit – V

Multiple Integrals – Double and triple integrals-region of integration. Evaluation of double integrals by change of order of integration.
Application of multiple integrals: Change of variables and applications to area and volume. Beta and Gamma functions – Definitions and problems only.
Self study component- Applications of double and triple integrals- Calculation of mass ,centre of gravity , centre of pressure and moment of inertia. Derivation for relationship between Beta and Gamma function and Duplication formula**.** **10 Hrs.**

Text Books

1. B.S. Grewal: Higher Engineering Mathematics, 42nd Edition- 2012, Khanna Publishers, New Delhi.
2. Engineering Mathematics:- N.P.Bali and Manish Goyal, Laxmi Publications, 7th Edn., 2007.

Reference Books:

1. Advanced Engineering Mathematics: - E. Kreyszig, John Wiley & Sons, 9th Ed.2011
2. Engineering Mathematics: Vol.-I & II:- S.S.Sastry, Prentice-Hall of India, 4th Ed.

Course Outcomes

At the end of the course the students shall be able to:

1 Explain linear system of equations, Eigen values/vectors similarity and diagonalisation of matrices
2 Solve linear second order differential equations.
3 Evaluate Laplace transforms and inverse Laplace transforms
4 Evaluate the Jacobeans, and the Taylors series expansion. and find the extreme values
5 Analyse the vector integration to use in the study of line integrals .
6 Evaluate the multiple integrals and Evaluate application oriented problems.

Training and Placement

Course Title: Professional Communication Development. (PCD)			
Course Code : P17HU28	**Semester : 2**	**L - T – P-H: 0 - 2 –0-2**	**Credits:1**
Contact Period: Lecture: 32Hrs, Exam: 3 Hr		**Weightage: CIE:50%; SEE:50%**	

Prerequisites: Effective Communication Development. (ECD)

Course Learning Objectives (CLOs)

This course aims to

1 Recognize common mistakes done by an individual in the course of his/her communication
2 Appraise knowledge level of English language and enhance better communication
3 Recognize the fear of speaking English and to build the morale
4 Identify common pronunciation error and rectify them
5 Enable the individual to build his/her creative thinking (thinking in English)
6 Understand the correct usage of Preposition and conjunctions
7 Effective Email writing skill
8 Enable the individual to write Blogs
9 Introduce the most scientific ways of mastering vocabulary.
10 Explain the concept of root words and the related words.

Course Content

Unit – I

Sentences: Introduction to simple and compound sentences, Techniques to build simple and compound sentences, Rules for constructing a complex sentence, Introduction to punctuation, Introduction to active and passive voice **6 Hrs.**

Unit – II

Preposition: Introduction to prepositions, Importance of usage of prepositions, Rectifying common errors in context to using preposition, Right usage of common prepositions like in, on, under, behind, below etc. **Conjunctions:** Introduction to conjunctions, Understanding the importance of usage of conjunctions, Usage of different conjunctions in a compound sentence, Understanding the meaning of conjunction like yet, since, until, however, but etc**.** **8 Hrs.**

Unit – III

Vocabulary builder - Gaining increased momentum

How to talk about actions– Verbs that accurately describe human activities, excursions into expressive terms good and evil, doing saying, wishing and pleasing. how to talk about various speech habits– words that explore in depth all the degrees and kinds of talk and silence, **how to insult your enemies–** terms for describing a disciplinarian, toady, dabbler, provocative woman, flag-waver, possessor of a one track mind, free thinker, sufferer from imaginary ailments, various manias and phobias, **how to flatter your friends**– terms for describing friendliness, energy, honesty, mental keenness, bravery, charm, sophistication, etc. **6 Hrs.**

Unit – IV

Writing Skills 2: Format for e-mail writing. Format for Letter Writing. Some common errors. Creative Writing. Blog Writing. **4 Hrs.**

Unit – V

Vocabulary builder - Finishing with a feeling of complete success.

How to talk about common phenomena and occurrences– Words for poverty and wealth, direct and indirect emotions, not calling spade a spade, banter and other light talk, animal like contentment, homesickness and different kind of secrecy. Excursions into terms expressive of goodness, of hackneyed phraseology, of human similarity to various animals, of kinds of sound, etc. How to react to the new words you meet in your reading.

How to talk about what goes on - Verbs that show exhaustion, criticism, self-sacrifice, repetition, mental stagnation, hinting, soothing, sympathizing, indecision, etc. How you can increase your vocabulary by picking your friends brains.

How to talk about a variety of personal characteristics: Adjectives that describe insincere humility, dissatisfaction, snobbery, courtesy to women, financial embarrassment, sadness, etc. How increasing your vocabulary has begun to change the intellectual climate of life.

8Hrs.

Reference Books:

"Word Power Made Easy New Revised and Expanded Edition", First Edition, Norman Lewis, Goyal Publisher.

"Essential English Grammar" by Raymond Murphy, published by Cambridge University Press.

Course Outcomes (CO)

After learning all the units of the course, the student is able to:

1. Amplified level of confidence to express themselves in English. L2
2. Elevated standard of learning through the implementation of creative cognitive techniques. L2
3. Understand the correct usage of Prepositions and Conjunctions. L4
4. Write Emails, Letters and Creative passages. L4
5. Apply the knowledge of vocabulary in his speaking and writing.

PHYSICS CYCLE I – Semester B.E. Time - Table for the Year : 2017 – 18

A – SECTION

Days	Room No.	9.05–10.00	10.00-10.30	10.30-11.25	11.25–12.20	12.20– 1.15	1.15-2.30	2.30– 3.25	3.25-4.20	4.20-5.15
MON	GBL 202	2	TEA BREAK	3	4	5	LUNCH			
TUE	GBL 202	5(T)		2	1	4		3	9	3 (T)
WED	GBL 202	5		$6A_1/7A_2$				4	2	1(T)
THU	GBL 202			4	2	3		5	1	4 (T)
FRI	GBL 202	8		8	5	1		$6A_2/7A_1$		
SAT	GBL305/202	2(T) (305)		1	3	9				

B - SECTION

Days	Room No.	9.05–10.00	10.00-10.30	10.30-11.25	11.25–12.20	12.20– 1.15	1.15-2.30	2.30– 3.25	3.25-4.20	4.20-5.15
MON	GBL 203		TEA BREAK	1	3	9	LUNCH	2	5	1(T)
TUE	GBL 203	4		5	3	1		$6B_1/7B_2$		
WED	GBL 203			2	4	5		9	1	3(T)
THU	GBL 203/306			5	3	4		2(T) (306)	5(T)(306)	
FRI	GBL 203	1		2	8	8		3	4	4(T)
SAT	GBL 202	2		$6B_2/7B_1$						

C - SECTION

Days	Room No.	9.05–10.00	10.00-10.30	10.30-11.25	11.25–12.20	12.20– 1.15	1.15-2.30	2.30– 3.25	3.25-4.20	4.20-5.15
MON	GBL 203/202	5(203)	TEA BREAK	$6C_1/7C_2$			LUNCH	4	1	5(T)
TUE	GBL 305/304	1		4	2	3		4(T) (304)	3(T) (304)	2(T) (304)
WED	GBL 203/202	3(203)		1	5	4				
THU	GBL 305	5		1	4	2		3	9	1(T)
FRI	GBL 305	2		$6C_2/7C_1$				8	8	
SAT	GBL 203	9		5	2	3				

D - SECTION

Days	Room No.	9.05–10.00	10.00-10.30	10.30-11.25	11.25–12.20	12.20– 1.15	1.15-2.30	2.30– 3.25	3.25-4.20	4.20-5.15
MON	GBL 305	1	TEA BREAK	5	2	3	LUNCH	5(T)	3(T)	
TUE	GBL 203			$6D_1/7D_2$				2	4	1(T)
WED	GBL 305	2 (T)		4	2	1		5	3	4(T)
THU	GBL 306	2		3	1	9		$6D_2/7D_1$		
FRI	GBL 305/202			5	3	4		9 (202)	1 (202)	
SAT	GBL 305	8		8	4	5				

E - SECTION

Days	Room No.	9.05–10.00	10.00-10.30	10.30-11.25	11.25–12.20	12.20– 1.15	1.15-2.30	2.30– 3.25	3.25-4.20	4.20-5.15
MON	GBL 306		TEA BREAK	4	5	2	LUNCH	$6E_1/7E_2$		
TUE	GBL 306			3	4	9		1	5	5 (T)
WED	GBL 306/ ALH:6	2		5	1	3		2(T) (ALH:6)	4(T) (ALH:6)	
THU	GBL 203	1		$6E_2/7E_1$				4	3	1 (T)
FRI	GBL 306			3	2	5		1	9	3(T)
SAT	GBL 306	4		2	8	8				

Sl. No.	Course Code	Course Title	Sl. No.	Course Code	Course Title
1	P17MA11	Engg. Maths-I	6	P17MEL16	Basic Mechanical Engg. Science Lab
2	P17PH12	Engg. Physics	7	P17PHL17	Physics lab
3	P17CV13	Engg. Mechanics	8	P17HU18	Effective communication development.
4	P17ME14	Elements of Mech. Engg.	9	P17HM19	Constitution of India(ICHRPE(2hrs)
5	P17EE15	Basic. Elect. Engg.			

Note: Sl No.8 – Advanced English &Person Evolution Classes s will be conducted in Placement Training center and MBA block.

CHEMISTRY CYCLE I - Semester B. E. Time - Table for the Year : 2017 - 18

F- SECTION

Days	Room No.	9.05–10.00	10.00-10.30	10.30-11.25	11.25–12.20	12.20– 1.15	1.15-2.30	2.30– 3.25	3.25-4.20	4.20-5.15
MON	GBL 301	3	TEA BREAK	5F			LUNCH	1	4	2(T)
TUE	GBL 301			1	4	3		9	10	1(T)
WED	GBL 301	1		$6F_1/7F_2$				2	3	4(T)
THU	GBL 301	2		5F				4	9	3(T)
FRI	GBL 301	3		1	2	10		$6F_2/7F_1$		
SAT	GBL 301	8		8	2	4				

G - SECTION

Days	Room No.	9.05–10.00	10.00-10.30	10.30-11.25	11.25–12.20	12.20– 1.15	1.15-2.30	2.30– 3.25	3.25-4.20	4.20-5.15
MON	GBL 302	3(T) (307)	TEA BREAK	4	1	3	LUNCH	2	9	1(T)
TUE	GBL 302	1		2	3	4		$6G_1/7G_2$		
WED	GBL304/302	10 (304)		5G				3	4	2(T)
THU	GBL302			3	4	9		1	10	4(T)
FRI	GBL 302	8		8	1	2		5G		
SAT	GBL 301	2		$6G_2/7G_1$						

H - SECTION

Days	Room No.	9.05–10.00	10.00-10.30	10.30-11.25	11.25–12.20	12.20– 1.15	1.15-2.30	2.30– 3.25	3.25-4.20	4.20-5.15
MON	GBL302/304	2(T) (302)	TEA BREAK	2	3	1	LUNCH	4	10	3(T)
TUE	GBL306/ 302	3 (306)		5H				2	9	4(T)
WED	GBL 302	1		4	2	3		$6H_1/7H_2$		
THU	GBL 302/301	9 (302)		3	2	1		5H		
FRI	GBL 306/302	4		$6H_2/7H_1$				8	8	1(T)(302)
SAT	GBL 302			4	1	10				

I - SECTION

Days	Room No.	9.05–10.00	10.00-10.30	10.30-11.25	11.25–12.20	12.20– 1.15	1.15-2.30	2.30– 3.25	3.25-4.20	4.20-5.15
MON	GBL 304/301	10 (304)	TEA BREAK	1	2	4	LUNCH	5I		
TUE	GBL 301/305	2 (301)		$6I_1/7I_2$				4	1	2(T)
WED	GBL 304			3	4	9		1	10	3(T)
THU	GBL 304	4		1	2	3		$6I_2/7I_1$		
FRI	GBL 202/301	4 (T) (202)		5I				3	9	1(T)
SAT	GBL 304	3		2	8	8				

J - SECTION

Days	Room No.	9.05–10.00	10.00-10.30	10.30-11.25	11.25–12.20	12.20– 1.15	1.15-2.30	2.30– 3.25	3.25-4.20	4.20-5.15
MON	GBL 306	2	TEA BREAK	$6J_1/7J_2$			LUNCH	1	3	4(T)
TUE	GBL 304	4		1	2	10		5J		
WED	GBL 301/306			2	3	4		1 (306)	9 (306)	1 (T) (306)
THU	GBL 202/304	3 (202)		$6J_2/7J_1$				2	4	2(T)
FRI	GBL 304	3(T)		4	8	8		10	3	9
SAT	GBL 302	1		5J						

Sl. No.	Course Code	Course Title	Sl. No.	Course Code	Course Title
1	P17MA11	Engg. Maths-I	6	P17CSL16	Programming Lab.
2	P17CH12	Engg. Chemistry	7	P17CHL17	Chemistry lab
3	P17CS13	C-Programming	8	P17HU18	Effective communication developmentt
4	P17EC15	Basic Electronics	9	P17EV19	Env. Studies
5	P17MED14	CAED.	10	P17HM110	Language (Kan.) (2hrs)

Note: Sl. No. 8 - Advanced English &Person Evolution Classes s will be conducted in Placement Training center and MBA block.

Chairman
(DrB.Shanmukha)
Time-Table Committee

Principal
(Dr V.Sridhar)
PESCE, Mandya

Events in Academic Calendar (Tentative)
(Odd Semester of 2017-18)
I, Semester B.E

Sl. No.	Date	Day	Remarks
1	10-08-2017	Thursday	*Orientation Day*
2	11-08-2017	Friday	*Course Registration*
3	12-08-2017	Saturday	*Commencement of classes*
4	02-09-2017	Saturday	Verification of Course Registration forms by Students/Mentors/HODs.
5	09-09-2017	Saturday	Submission of Application form SEE
6	14-09-2017	Thursday	Submission of Assignment-I
7	21-09-2017	Thursday	* *Test - I & Quiz – I*
8	22-09-2017	Friday	* *Test - I & Quiz – I*
9	23-09-2017	Saturday	* *Test - I & Quiz – I*
10	28-09-2017	Thursday	Regular classes / Submission of Test - I & Quiz - I marks to COE
11	30-10-2017	Monday	Regular classes / Submission of Assignment-II
12	09-11-2017	Thursday	* *Test - II & Quiz – II*
13	10-11-2017	Friday	* *Test - II & Quiz – II*
14	11-11-2017	Saturday	* *Test - II & Quiz – II*
15	15-11-2017	Wednesday	Regular classes / Submission of Test - II & Quiz - II marks to COE
16	23-11-2017	Thursday	Regular classes / Makeup Test
17	24-11-2017	Friday	Regular classes / Makeup Test
18	25-11-2017	Saturday	Regular classes / Makeup Test
19	27-11-2017	Monday	Posting of Attendance online
20	28-11-2017	Tuesday	Posting of CIE online
21	29-11-2017	Wednesday	Last working Day
22	30-11-2017 to 09-12-2017		SEE Practical Exam
23	11-12-2017 to 23-12-2017		SEE Theory Exam

Total number of Odd semester working days=82
06 Days for Test/Quiz =06 days
Total number of Regular Class workdays= 76
76/6=12.66 weeks*4 Classes/week = 50.66 classes/semester